College Board

SAT® SUITE
OF ASSESSMENTS

Alignment to Connecticut Core Standards

COLLEGE BOARD AND CONNECTICUT

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Executive Summary

This report details College Board's study of the alignment between the Connecticut Core Standards and the digital SAT® Suite of Assessments. Though not designed to align to any single set of academic content standards, the digital SAT Suite tests are firmly grounded in the same sorts of high-quality evidence used by states and others to develop their college and career readiness standards, meaning that states may employ the tests as valid, reliable, and fair assessments of their students' attainment of key postsecondary prerequisites.

The key features of the digital SAT Suite's Reading and Writing section are

- the use of a specified range of text complexity consistent with college and workforce training requirements;
- an emphasis on close reading and use of evidence, both textual and quantitative;
- the inclusion of data and informational graphics, which students must analyze in conjunction with text;
- a focus on the use and meaning of high-utility words and phrases in context;
- attention to a core set of important Standard English conventions and to effective written expression more generally; and
- the requirement that students work and demonstrate facility with texts across a wide range of disciplines, including literature, history/social studies, the humanities, and science.

The key features of the digital SAT Suite's Math section are

- a strong focus on the content that matters most for college and career readiness and success;
- an emphasis on rich applied problems in real-life settings in which the use of mathematical practices is integrated with the content;
- a balance of fluency, conceptual understanding, and application items within and across all content topics; and
- an emphasis on problem-solving and data analysis.

Based on a thorough review of the Connecticut Core Standards, we find that the digital SAT Suite **strongly aligns** and thereby supports students' progress toward educational and workplace success.[1] The following table provides detail by program and grade level:

Connecticut Core Standards	College Board Assessment	Degree of Alignment
Grades 11–12 **English Language Arts/Literacy**	SAT	Very strong
Grades 9–10 and Grades 11–12 **English Language Arts/Literacy**	PSAT/NMSQT and PSAT 10	Very strong
Grade 8 and Grades 9–10 **English Language Arts/Literacy**	PSAT 8/9	Very strong
Standards for High School **Mathematics**	SAT	Strong
Standards for High School **Mathematics**	PSAT/NMSQT and PSAT 10	Strong
Standards for Grade 8 **Mathematics**	PSAT 8/9	Strong

In the sections that follow, we offer a description of our alignment methodology and a more detailed summary of our findings in each content area. Appendices to this document provide detailed alignment tables for each grade/course and subject area.

[1] In his widely published research on the alignment of educational expectations with large-scale assessment systems, Norman Webb asserts, among other criteria, that at least 50% of the skills within a content category should have at least one related assessment item. When looking at alignment matches between the Connecticut Core Standards and the testing domains of the SAT Suite, our team found the alignment to be "strong" (equal to or greater than 50% of standards aligned) to "very strong" (equal to or greater than 75% of standards aligned). See Norman L. Webb, "Issues Related to Judging the Alignment of Curriculum Standards and Assessments," *Applied Measurement in Education* 20, no. 1 (December 2007): 7–25. https://www.cehd.umn.edu/edpsych/c-bas-r/docs/webb2007.pdf.

Section 1: Alignment Summary

In his widely published research on alignment, Norman Webb writes, “Assessments, as well as curricula, designed to fulfill expectations and standards are constrained by very pragmatic factors such as time, sequencing, and a high variation in the rate of learning. These constraints force those who develop assessments to make decisions about the amount of emphasis or weight that will be given to different topics[2] on a test.” He goes on to define the criteria by which an assessment program can measure itself, using a “scale of agreement” whereby an acceptable alignment can be achieved when “assessments cover a sufficient number of topics in expectations so that a student judged to have acceptable knowledge on the assessments will have demonstrated some knowledge on nearly all topics in expectations.”[3]

Webb writes that “judging alignment is strengthened by using specific criteria to analyze agreement among expectations and assessments.” One of these specific criteria is *categorial concurrence*, which is achieved when “the same or consistent categories of content appear in both expectations and assessments.”

There is strong concurrence between the SAT Suite and the categories of knowledge defined in the Connecticut Core Standards. While not every standard is assessed within the SAT Suite, nearly all domains are represented, and a variety of standards are sampled from each domain. In the sections that follow, we provide a detailed summary of alignment between the SAT Suite and the Connecticut Core Standards for English Language Arts/Literacy and Mathematics.

English Language Arts/Literacy

The Connecticut Core Standards for English Language Arts/Literacy represent the essential skills and knowledge students should develop in literacy as they prepare for success in college, career, and life beyond secondary education. The standards require students to read literature as well as informational texts and argumentative texts that address relevant questions in content areas such as science and history/social studies. The standards stress critical thinking,

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[2] Webb defines topics as large categories of knowledge “identified by standards or main areas of content specified.”

[3] Norman L. Webb, *Criteria for Alignment of Expectations and Assessments in Mathematics and Science Education* (Council of Chief State School Officers and National Institute for Science Education Research Monograph No. 6). (Madison: University of Wisconsin, Wisconsin Center for Education Research, 1997): 23. **https://files.eric.ed.gov/fulltext/ED414305.pdf**.

analytical, and reasoning skills that require students to refer to what they have read for evidence and support. Additionally, students are asked to demonstrate proficiency in core conventions of Standard English as well as demonstrate skills in vocabulary, syntax, and other language use.

The digital SAT Suite's Reading and Writing section—administered as part of the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9—measures many of the same skills and knowledge emphasized in the Connecticut Core Standards. The primary aim of the Reading and Writing section is to assess students' readiness for college and workforce training with respect to literacy. To that end, the Reading and Writing section focuses on key elements of comprehension, rhetoric, writing, and language conventions that have been identified by the best available evidence as necessary for postsecondary readiness and success.

Students who are successful on the Reading and Writing section will be able to

- demonstrate understanding of **information and ideas** in texts across a range of academic disciplines and complexities aligned with college and career readiness requirements;
- effectively evaluate the **craft and structure** of texts, including demonstrating understanding and proficient use of high-utility academic vocabulary in context;
- revise the **expression of ideas** in texts to enhance communicative power in accordance with specified rhetorical goals; and
- edit texts in accordance with **Standard English conventions** in order to meet academic and workplace expectations regarding the use of standardized expression.

College Board's comparison of the digital SAT Suite Reading and Writing section to the Connecticut Core Standards in ELA/L, including content area literacy standards, finds that the alignment is strong. While there are some ELA/L standards that the digital SAT Suite is not designed to measure—notably those for speaking and listening, publication, and research—the suite offers a valid, reliable, and fair assessment of the core reading, writing, and language requirements of the Connecticut Core Standards.

College Board's alignment study looked at each digital SAT Suite program and considered its alignment to the corresponding anchor and/or grade-specific standards in ELA/L. Specifically, the study examined the following comparisons:

1. Digital SAT Suite to the Anchor standards in Reading, Writing, and Language
2. Digital SAT to the standards in grades 11–12
3. Digital PSAT/NMSQT and PSAT 10 to the standards in grades 9–10 and grades 11–12
4. Digital PSAT 8/9 to the standards in grade 8 and grades 9-10

Below are summaries of College Board's alignments by grade and test(s).

- **Anchor standards**: Of the twenty-six Anchor standards in Reading, Writing, and Language, twenty-one (81%) align with the test design of the digital SAT Suite. All Reading and Language Anchor standards align to the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9. There is no alignment to anchors involving research, publication, or writing over extended time frames.
- **Grades 11–12 standards**: Of the 50 standards in Reading, Writing, and Language, 37 (74%) align with the test design of the digital SAT and the digital PSAT/NMSQT and PSAT 10. Most of the standards for literacy in history/social studies, science, and technical subjects (79%) are likewise aligned to the test design, as the suite presents students with rigorous science

and history/social studies texts in addition to humanities and literature texts. Like its paper-based predecessor, the digital SAT Suite is not designed to assess long-range research (W.11–12.7, W.11–12.8) or writing over extended time frames (W.11–12.10). The digital SAT Suite does, however, assess students' ability to read, analyze, and reason about a wide array of texts in different disciplines; synthesize information across texts; use textual and quantitative evidence; revise writing for development, organization, and style; and edit texts to demonstrate mastery of core conventions of Standard English grammar, usage, and punctuation.

- **Grades 9–10 standards**: The alignment of the grades 9–10 standards closely resembles that of the standards in grades 11–12. Of the 50 standards in Reading, Writing, and Language, 39 (78%) align to the test design of the digital PSAT/NMSQT and PSAT 10 and the digital PSAT 8/9. Additionally, most of the grades 9–10 content area literacy standards in history/social studies, science, and technical subjects (79%) are in alignment.
- **Grade 8**: Of the 50 ELA/L standards in Reading, Writing, and Language, 39 (78%) align to the test design of the digital PSAT 8/9. Additionally, most of the grades 6-8 content area literacy standards in history/social studies, science, and technical subjects (83%) are in alignment.

Readers who wish to see detailed alignments of the digital SAT Suite to the Connecticut Core Standards (including the standards for literacy in history/social studies, science, and technical subjects) can find these in **Appendix B: Alignments of ELA/L Standards to Digital SAT Suite**.

Math

The Connecticut Core Standards for Mathematics represent what students should know and be able to do in math as they become college and career ready. From kindergarten through grade 8, the standards define increasingly sophisticated skills and knowledge that build on one another. In high school, the standards are organized into conceptual categories: number and quantity, algebra, functions, modeling, geometry, and statistics and probability. At every level, the standards describe the variety of mathematical knowledge, proficiencies, and processes that help create a strong foundation in students' mathematical thinking, reasoning, and problem-solving.

The digital SAT Suite's Math section—administered as part of the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9—measures many of the same skills and knowledge emphasized in the Connecticut Core Standards. Like the Connecticut Core Standards, the digital SAT Suite Math section is focused on the skills and knowledge that reflect a student's fluency with, understanding of, and ability to apply the math concepts, skills, and practices that are most essential for postsecondary work.

The Math section of the digital SAT Suite is designed to elicit evidence from student performance in support of four broad claims about students' math achievement. To be successful on the Math section, students must be able to

- analyze, fluently solve, and create linear equations and inequalities as well as analyze and fluently solve systems of linear equations and inequalities using multiple techniques (**Algebra**);
- exhibit attainment of skills and knowledge central for progression to more advanced math courses, including analyzing and fluently solving absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear functions (**Advanced Math**);

- apply quantitative reasoning about ratios, rates, and proportional relationships; understand and apply unit rate; and analyze and interpret one- and two-variable data (**Problem-Solving and Data Analysis**); and
- solve problems that focus on perimeter, area, and volume; angles, triangles, and (PSAT/NMSQT, PSAT 10, and SAT only) trigonometry; and circles (SAT only) (**Geometry and Trigonometry**).

While the Connecticut Core Standards for Mathematical Practice are not specifically addressed in this report, these standards can be found interwoven throughout the digital SAT Suite. In order to do well on the varied item types they will see, students must make sense of problems and persevere in solving them (Math Practice 1). Students have many opportunities to make use of structure (Math Practice 7) in the Algebra and Advanced Math content domains, and they must evaluate claims (Math Practice 3) in the Problem-Solving and Data Analysis domain. Students represent quantities in context with mathematical relationships and interpret their results (Math Practice 2) in all three of those domains. Mathematical modeling (Math Practice 4) is especially important in the domains of Algebra, Advanced Math, and Geometry and Trigonometry.

College Board's comparison of the digital SAT Suite Math section to the Connecticut Core Standards finds that the alignment overall is strong. College Board's math experts examined each digital SAT Suite program and considered its alignment to the math standards from grade 8 through high school using the course progressions outlined in the Common Core's Appendix A, which correspond to the Connecticut Core Standards for Mathematics. Specifically, the study examined the following comparisons:

1. Digital SAT Suite to Algebra I
2. Digital SAT Suite to Geometry
3. Digital SAT Suite to Algebra II
4. Digital SAT Suite to Mathematics I
5. Digital SAT Suite to Mathematics II
6. Digital PSAT 8/9 to Grade 8 Math

Below are summaries of College Board's alignments by grade and test(s).

- **Algebra I**: Research shows the distinctive importance of algebra with respect to postsecondary success. As a result, there is a strong alignment of the digital SAT Suite to Algebra I. Of the 48 standards identified for Algebra I, 37 of these (77%) align to the digital SAT, the digital PSAT/NMSQT and PSAT 10, and the digital PSAT 8/9.
- **Geometry**: Geometry is an important domain assessed within the digital SAT Suite. Each program in the suite assesses a sampling of key Geometry standards. Of the 44 standards identified for high school Geometry, 20 of these (45%) align to the digital SAT, PSAT/NMSQT and PSAT 10, and 12 of these (27%) align to the digital PSAT 8/9.
- **Algebra II**: Of the 38 standards identified for Algebra II, 20 (53%) align to the digital SAT, PSAT/NMSQT and PSAT 10, and 17 of these (45%) align to the digital PSAT 8/9.
- **Mathematics I**: When considering math standards organized by integrated pathways, we find similarly strong alignments, especially in standards that are critical for general college and career readiness. Of the 51 standards in Mathematics I, 34 of these (67%) align to the digital SAT, PSAT/NMSQT and PSAT 10, and 33 of these (65%) align to the digital PSAT 8/9.

- **Mathematics II**: Of the 54 standards in Mathematics II, 34 of these (63%) align to the digital SAT, PSAT/NMSQT and PSAT 10, and 27 of these (50%) align to the digital PSAT 8/9.
- **Grade 8**: The grade 8 standards are well represented on the PSAT 8/9. Of the 28 standards in grade 8, 18 (64%) align to the digital PSAT 8/9. As is true for the high school domains, grade 8 algebra and functions standards show a particularly strong alignment to the digital PSAT 8/9.

Readers who wish to see detailed alignments to the digital SAT Suite can find these in **Appendix C: Alignments of Math Standards to Digital SAT Suite**.

Section 2: The Digital SAT Suite

The following is a brief overview of the digital SAT Suite of Assessments. An exhaustive discussion of the suite and its tests can be found in the ***Assessment Framework for the Digital SAT Suite***.

The *digital SAT Suite of Assessments* is College Board's collective term for its flagship suite of college and career readiness testing programs and services. The digital suite continues and expands on College Board's core commitments to access and opportunity for all students. These commitments include

- offering valid, reliable, fair, and objective assessments of students' academic achievement,
- providing actionable information to students and educators about evidence-based ways to build on academic strengths and to address skill and knowledge shortcomings relevant to college and career readiness,
- connecting students to opportunities they have earned through their hard work in school, such as admission to postsecondary institutions well suited to their achievement and interests as well as scholarships and recognition programs,
- helping state users meet federal accountability requirements through industry-leading assessments, services, and documentation, and
- helping higher education institutions to find and enroll prospective students and then to support those students so that they can be successful on their campuses.

The digital SAT Suite consists of four testing programs, each with its own purpose(s) and target population.

- The **SAT** is typically administered to high school juniors and seniors. The test measures essential prerequisites for postsecondary readiness and success as determined through an extensive, ongoing research process.
- **PSAT/NMSQT** and **PSAT 10** are typically administered to high school sophomores and juniors. PSAT/NMSQT is administered in the fall of each academic year, while PSAT 10 is administered in the spring. The PSAT/NMSQT and PSAT 10 tests are identical in format and content, but only PSAT/NMSQT serves as a qualifying test for the National Merit Scholarship Corporation's annual scholarship program. PSAT/NMSQT and PSAT 10 serve as

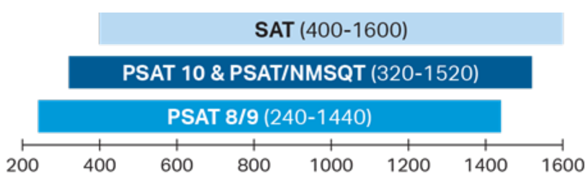
opportunities to check in on students' progress toward postsecondary readiness and to focus students' preparation for post–high school study.

- **PSAT 8/9** is typically administered to eighth and ninth graders and serves as a baseline for assessing students' readiness for college and career.

The four tests measure the same broad knowledge domains and skills, with slight modifications reflecting differences in the age and attainment of students across the secondary grades, making it easier for students, families, and educators to monitor student progress and address any areas of weakness.

Each test in the digital SAT Suite consists of two sections: a Reading and Writing (RW) section and a Math section. Correspondingly, each test yields three scores—two section scores and a total score (the last of which is the arithmetic sum of the section scores)—accompanied by test interpretation tools that allow test takers and their families, educators, and other stakeholders to make informed, data-based decisions about students' educational futures. Scores for all the assessments are on the same vertical scale, allowing meaningful interpretations about students' academic growth as they move between testing programs within the suite.

Figure 1 graphically depicts the total score scales of the digital SAT Suite assessments.



The standard administration[4] for each of the digital SAT Suite tests employs a multistage adaptive test (MST) model. In the digital suite's two-stage MST model, each test section (Reading and Writing; Math) is divided into two separately timed, equal-length portions (*stages*), each consisting of a *module* of test questions. The first module of each test section consists of questions across a broad span of difficulty (i.e., easy, medium, and hard questions) so that a robust if provisional assessment of test taker achievement can be obtained. The customized test delivery platform used for the digital SAT Suite then uses that information to select the second (and final) module to administer to a given test taker. This second module consists of questions that are, on average, more or less difficult than the questions in the first module. Questions from all four Reading and Writing and Math content domains (discussed below) are included in each section's modules; this ensures, in part, that students are sampled fairly on all key content dimensions in the first module prior to being routed to the second in each section. Adaptive testing in this way is highly beneficial to students (and other stakeholders) because the same quality of testing (in terms of desirable content and psychometric properties) is delivered via significantly shorter testing instruments than would be possible if linear (nonadaptive) test forms were used instead.

[4] Although the vast majority of students will take the digital SAT Suite tests electronically on a digital device, paper-based and other accommodations, including linear (nonadaptive) test forms, are available for students with approved accommodations who require them to access the tests and their content. Though not discussed further in this document, the linear test specifications closely mirror those for the digital adaptive tests, although each linear test is slightly longer than its counterpart to account for the lack of adaptivity in linear testing. See Appendix D in the Assessment Framework for the Digital SAT Suite for more information on these linear tests and their specifications.

Question pools for the digital SAT Suite tests are sufficiently large to permit each student to be administered a unique but highly comparable test form, thereby making the tests highly secure while ensuring that each student receives a form tightly aligned with the test's specifications.

Table 1 below summarizes the basic characteristics of the digital SAT Suite tests.

Table 1: Overall Specifications for the Digital SAT Suite Tests

Characteristic	Reading and Writing Section	Math Section
Administration	Two-stage adaptive test design; one Reading and Writing section administered via two separately timed modules	Two-stage adaptive test design; one Math section administered via two separately timed modules
Test length (number of operational and pretest questions)	1st module: 25 operational questions and 2 pretest questions 2nd module: 25 operational questions and 2 pretest questions	1st module: 20 operational questions and 2 pretest questions 2nd module: 20 operational questions and 2 pretest questions
Time per stage	1st module: 32 minutes 2nd module: 32 minutes	1st module: 35 minutes 2nd module: 35 minutes
Total number of questions	54 questions	44 questions
Total time allotted	64 minutes	70 minutes
Average time per question	1.19 minutes	1.59 minutes
Scores reported	Total score Section scores (Reading and Writing; Math)	
Question type(s) used	Discrete; four-option multiple-choice	Discrete; four-option multiple-choice (≈75%) and student-produced response (SPR) (≈25%)
Stimulus subject areas	Literature, history/social studies, humanities, science	Science, social studies, real-world topics
Word count	25–150 (6-character) words per stimulus text	Approximately 30% of questions in context; a majority of in-context questions have 50 (6-character) words or fewer
Informational graphics	Yes; tables, bar graphs, line graphs	Yes
Text complexity bands	Grades 6–8, grades 9–11, grades 12–14 (Grades 12–14 excluded from PSAT 8/9)	N/A[5]

[5] Math contexts are not formally rated for text complexity. However, Math test development staff review each context qualitatively to ensure that its linguistic load and demands are consistent with the requirements of the question being posed, and Math (and Reading and Writing) staff have been trained in linguistic modification principles, which seek to relieve students of unnecessary linguistic burdens during test taking through clear and concise word choice in contexts and questions.

The Reading and Writing Section

The Reading and Writing section of the digital SAT Suite assessments is designed to measure students' attainment of critical college and career readiness prerequisites in literacy in English language arts as well as in various academic disciplines, including literature, history/social studies, the humanities, and science. The Reading and Writing section focuses on key elements of comprehension, rhetoric, and language use that the best available evidence identifies as necessary for postsecondary readiness and success. Over the course of a Reading and Writing section of one of the digital SAT Suite assessments, students answer multiple-choice questions requiring them to read, comprehend, and use information and ideas in texts; analyze the craft and structure of texts; revise texts to improve the rhetorical expression of ideas; and edit texts to conform to core conventions of Standard English.

The construct for the Reading and Writing section is literacy achievement relative to core college and career readiness requirements in English language arts as well as in the academic disciplines of literature, history/social studies, the humanities, and science.

Students who are successful on the Reading and Writing section will be able to

- demonstrate understanding of information and ideas in texts across a range of academic disciplines and complexities aligned with college and career readiness requirements.
- effectively evaluate the craft and structure of texts, including demonstrating understanding and proficient use of high-utility academic vocabulary in context.
- revise the expression of ideas in texts to enhance communicative power in accordance with specified rhetorical goals.
- edit texts in accordance with Standard English conventions in order to meet academic and workplace expectations regarding the use of standardized expression.

Each of the claims listed above corresponds to one of the four content domains that form the architecture of the Reading and Writing section. Table 2 offers a synopsis of the content domain structure of the section, the skill/knowledge testing points addressed in each content domain, and the distribution of operational (non-pretest) questions by domain.

Table 2: Digital SAT Suite Reading and Writing Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Information and Ideas	Students will use comprehension, analysis, and reasoning skills and knowledge as well as what is stated and implied in texts (including in any accompanying informational graphics) to locate, interpret, evaluate, and integrate information and ideas.	Central Ideas and Details Command of Evidence • Textual • Quantitative Inferences	≈26%/ 12–14 questions

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Craft and Structure	Students will use comprehension, vocabulary, analysis, synthesis, and reasoning skills and knowledge to use and determine the meaning of high-utility academic words and phrases in context, evaluate texts rhetorically, and make supportable connections between multiple topically related texts.	Words in Context Text Structure and Purpose Cross-Text Connections	≈28%/ 13–15 questions
Expression of Ideas	Students will use revision skills and knowledge to improve the effectiveness of written expression in accordance with specified rhetorical goals.	Rhetorical Synthesis Transitions	≈20%/ 8–12 questions
Standard English Conventions	Students will use editing skills and knowledge to make text conform to core conventions of Standard English sentence structure, usage, and punctuation.	Boundaries Form, Structure, and Sense	≈26%/ 11–15 questions

All questions on the Reading and Writing section are four-option multiple-choice in format, with a single best answer for each question.

Questions in the Reading and Writing section are broken down into *content domains*, *skills*, and *task groups* and are also associated with one of four *subject areas* representing the content area of the passage(s) used as stimuli. *Content domains*, as discussed above, are the four large categories of skills and knowledge assessed on the digital SAT Suite tests: Information and Ideas, Craft and Structure, Expression of Ideas, and Standard English Conventions. Each of these domains is further broken down into *skills*, otherwise known as skill/knowledge testing points, which identify the range of skills and knowledge assessed in the section. *Task groups* associated with each skill identify the range of testable approaches within each skill. For example, a Central Ideas and Details question (a skill in the Information and Ideas content domain) may assess either an explicit or implicit central idea or detail. Subject area tags indicate which of the four content areas—literature (LIT), history/social studies (HSS), the humanities (HUM), and science (SCI)—is(are) eligible to be represented in the stimuli associated with each task group. To continue the previous example, Central Ideas and Details questions, whether focused on explicit or implicit ideas and details, may have stimuli from any of the four subject areas represented in the digital SAT Suite RW section. Table 3 summarizes the RW taxonomy.

Table 3: Reading and Writing Section Taxonomy in Detail

Content Dimension	Description
Text Complexity	The passages (and pairs of passages) on the Reading and Writing section represent a specified range of text complexities from grades 6–8 through grades 12–14. (Grades 12–14 passages are excluded from appearing on PSAT 8/9.)
Information and Ideas	Students will use comprehension, analysis, and reasoning skills and knowledge as well as what is stated and implied in texts (including in any accompanying informational graphics) to locate, interpret, evaluate, and integrate information and ideas.
Central Ideas and Details	Students will determine the central idea of a text and/or interpret the key details supporting that idea.

Content Dimension	Description
Inferences	Students will draw reasonable inferences based on explicit and/or implicit information and ideas in a text.
Command of Evidence	Students will determine the evidence in a text that best supports a specified claim or point.
Textual	Students will determine the textual evidence (e.g., a fact, detail, or example from a text) that best supports a specified claim or point.
Quantitative	Students will determine the quantitative evidence (i.e., data from an informational graphic) that best supports a specified claim or point.
Craft and Structure	Students will use comprehension, vocabulary, analysis, synthesis, and reasoning skills and knowledge to use and determine the meaning of high-utility words and phrases in context, evaluate texts rhetorically, and make supportable connections between multiple topically related texts.
Words in Context	Students will determine the meaning of a high-utility academic word or phrase in context or use such vocabulary in a contextually appropriate way.
Text Structure and Purpose	Students will analyze the structure of a text or determine the main rhetorical purpose of a text.
Cross-Text Connections	Students will draw reasonable connections between two texts on a related topic.
Expression of Ideas	Students will use revision skills and knowledge to improve the effectiveness of written expression in accordance with specified rhetorical goals.
Rhetorical Synthesis	Students will strategically integrate information and ideas on a topic to form an effective sentence achieving a specified rhetorical aim.
Transitions	Students will determine the most effective transition word or phrase to logically connect information and ideas in a text.
Standard English Conventions	Students will use editing skills and knowledge to make text conform to core conventions of Standard English sentence structure, usage, and punctuation.
Boundaries	Students will edit text to ensure that sentences are conventionally complete.
Form, Structure, and Sense	Students will edit text to conform to conventional usage (e.g., agreement, verb tense/aspect).

The Math Section

The Math section of the digital SAT Suite assessments is designed to measure students' attainment of critical college and career readiness prerequisites in math. The digital SAT Suite Math section focuses on key elements of algebra, advanced math, problem-solving and data analysis, and geometry and (SAT, PSAT/NMSQT, and PSAT 10 only) trigonometry that the best available evidence identifies as necessary for postsecondary readiness and success. Over the course of the Math section of one of the digital SAT Suite assessments, students answer multiple-choice and student-produced response (SPR) questions that measure their fluency with, understanding of, and ability to apply the math concepts, skills, and practices that are most essential for readiness for entry-level postsecondary work.

The construct for the Math section is math achievement relative to core college and career readiness requirements. Although literacy achievement is not directly measured, students are still required to employ such skills and knowledge to a limited, carefully constrained extent when solving math problems set in context.

In general terms, students who are successful on the Math section will be able to

- analyze, fluently solve, interpret, and create linear equations and inequalities as well as analyze and fluently solve systems of equations using multiple techniques.
- demonstrate attainment of skills and knowledge central for successful progression to more advanced math courses, including analyzing, fluently solving, interpreting, and creating equations, including absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear equations, as well as analyzing and fluently solving systems of linear and nonlinear equations in two variables.
- apply quantitative reasoning about ratios, rates, and proportional relationships; understand and apply unit rate; and analyze and interpret one- and two-variable data.
- solve problems that focus on perimeter, area, and volume; angles, triangles, and trigonometry; and circles.

These general suite-level claims are modified to some extent at the individual test program level to account for differences in the age and attainment of the test-taking populations served by each testing program, as elaborated below.

Each of the claims listed above corresponds to one of the four content domains that form the architecture of the Math section. Tables 4 through 6 display the domain structure of the Math section by test program level, beginning with the SAT. The tables include the domains and their associated claims, the skill/knowledge testing points addressed in each domain, and the distribution of operational (scored) questions by domain on each test form.

Table 4: Digital SAT Math Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Algebra	Students will interpret, create, use, represent, and solve problems using linear representations, and make connections between different representations of linear relationships, all from high school algebra courses preparatory for the math aligned with college and career readiness expectations.	Linear equations in one variable Linear equations in two variables Linear functions Systems of two linear equations in two variables Linear inequalities in one or two variables	≈35%/ 13–15 questions
Advanced Math	Students will interpret, rewrite, fluently solve, make strategic use of structure, and create absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear equations and make connections between different representations of a nonlinear relationship between two variables, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions	≈35%/ 13–15 questions

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Problem-Solving and Data Analysis	Using quantitative reasoning, students will fluently solve problems using percentages, proportional relationships, ratios, rates, and units; analyze and interpret distributions of data; use various representations of data to find relative frequency, probabilities, and conditional probabilities; fit models to data and compare linear and exponential growth; and calculate, compare, and interpret mean, median, range, and standard deviation, understand basic study design, and interpret margin of error, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Ratios, rates, proportional relationships, and units Percentages One-variable data: distributions and measures of center and spread Two-variable data: models and scatterplots Probability and conditional probability Inference from sample statistics and margin of error Evaluating statistical claims: observational studies and experiments	≈15%/ 5–7 questions
Geometry and Trigonometry	Students will solve problems associated with length, area, volume, and scale factors using geometric figures; determine congruence, similarity, and sufficiency using concepts and theorems about vertical angles, triangles, and parallel lines cut by a transversal; solve problems using the Pythagorean theorem, right triangle and unit circle trigonometry, and properties of special right triangles; and use properties and theorems relating to circles to solve problems, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Area and volume Lines, angles, and triangles Right triangles and trigonometry Circles	≈15%/ 5–7 questions

Table 5: Digital PSAT/NMSQT and PSAT 10 Math Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Algebra	Students will interpret, create, use, represent, and solve problems using linear representations and make connections between different representations of linear relationships, all from high school algebra courses preparatory for the math aligned with college and career readiness expectations.	Linear equations in one variable Linear equations in two variables Linear functions Systems of two linear equations in two variables Linear inequalities in one or two variables	≈35%/ 13–15 questions
Advanced Math	Students will interpret, rewrite, fluently solve, make strategic use of structure, and create absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear equations and make connections between different representations of a nonlinear relationship between two variables, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions	≈32.5%/ 12–14 questions
Problem-Solving and Data Analysis	Using quantitative reasoning, students will fluently solve problems using percentages, proportional relationships, ratios, rates, and units; analyze and interpret distributions of data; use various representations of data to find relative frequency, probabilities, and conditional probabilities; fit models to data and compare linear and exponential growth; and calculate, compare, and interpret mean, median, and range and compare distributions with the same and different standard deviation, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Ratios, rates, proportional relationships, and units Percentages One-variable data: distributions and measures of center and spread Two-variable data: models and scatterplots Probability and conditional probability Inference from sample statistics	≈20%/ 7–9 questions
Geometry and Trigonometry	Students will solve problems associated with length, area, volume, and scale factors using geometric figures; determine congruence, similarity, and sufficiency using concepts and theorems about vertical angles, triangles, and parallel lines cut by a transversal; and solve problems using the Pythagorean theorem and right triangle trigonometry, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Area and volume Lines, angles, and triangles Right triangles and right triangle trigonometry	≈12.5%/ 4–6 questions

Table 6: Digital PSAT 8/9 Math Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Algebra	Students will interpret, create, use, represent, and solve problems using linear representations and make connections between different representations of linear relationships, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Linear equations in one variable Linear equations in two variables Linear functions Systems of two linear equations in two variables Linear inequalities in one or two variables	≈42.5%/ 16–18 questions
Advanced Math	Students will rewrite, fluently solve, and make strategic use of structure, absolute value, quadratic, exponential, polynomial, and other nonlinear equations and make connections between different representations of a nonlinear relationship between two variables, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions	≈20%/ 7–9 questions
Problem-Solving and Data Analysis	Using quantitative reasoning, students will fluently solve problems using percentages, proportional relationships, ratios, rates, and units; analyze and interpret distributions of data; use various representations of data to find relative frequency, probabilities, and conditional probabilities; fit models to data; and calculate, compare, and interpret mean, median, and range, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Ratios, rates, proportional relationships, and units Percentages One-variable data: distributions and measures of center and spread Two-variable data: models and scatterplots Probability and conditional probability	≈25%/ 9–11 questions
Geometry	Students will solve problems associated with length, area, volume, and scale factors using geometric figures; apply theorems such as triangle sum; and solve problems using the Pythagorean theorem, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Area and volume Lines, angles, and triangles, including right triangles	≈12.5%/ 4–6 questions

Two question formats are used on the Math section. Approximately 75 percent of the questions are in the four-option multiple-choice (MC) format, for which students are asked to select the single best response from among the four provided answer options. The remaining approximately 25 percent of questions are in the student-produced response (SPR) format, for which students are asked to generate and enter their own responses; while these questions may have more than one possible correct response, students are directed to supply only one answer.

The MC and SPR questions will measure skills and knowledge across the four content dimensions of the tests as shown in table 7.

Table 7: Digital SAT Suite Math Section: Distribution of MC and SPR Question Formats across Content Domains

Digital SAT Suite Testing Program	Question Format	Algebra	Advanced Math	Problem-Solving and Data Analysis	Geometry and Trigonometry (SAT, PSAT/NMSQT, PSAT 10)/Geometry (PSAT 8/9)	Total
SAT	MC	10–11	10–11	4–5	4–5	28–32
	SPR	3–4	3–4	1–2	1–2	8–12
PSAT/NMSQT/10	MC	10–11	10–11	5–6	3–4	28–32
	SPR	3–4	2–3	2–3	1–2	8–12
PSAT 8/9	MC	14–15	5–6	6–7	3–4	28–32
	SPR	2–3	2–3	3–4	1–2	8–12

Detailed views of the Math taxonomy are presented in Appendix A: Math Section Taxonomy in Detail, including the skill/knowledge testing points in each of four domains: Algebra, Advanced Math, Problem-Solving and Data Analysis, and Geometry (and Trigonometry).

Section 3: Evidentiary Foundations

In line with its primary purpose, the digital SAT Suite of Assessments is founded on the best available evidence concerning essential college and career readiness prerequisites. When designing the digital suite, College Board drew on three main sources of such evidence.

- Research conducted or planned on the design of the digital SAT Suite itself, which includes an extensive series of one-time and ongoing studies intended to gather evidence in support of design features of the suite.
- Construct and content validity evidence, which affirms the choices College Board has made in determining what skills and knowledge should be assessed by the digital SAT Suite.
- Subject area evidence, which confirms important content emphases in English language arts/literacy and math assessment on the digital SAT Suite.

This section briefly summarizes the process used to examine and the findings from each source. A full overview of the evidence, including extensive research citations, may be found in chapter 5 of the ***Assessment Framework for the Digital SAT Suite***.

Research on the digital SAT Suite. The process of conducting research undergirding key design decisions for the digital SAT Suite continues College Board's tradition of exhaustively examining every aspect of its tests to ensure that they meet or exceed the highest standards for large-scale standardized assessment. These studies, both one-time and ongoing, assess the validity, reliability, and fairness of the digital SAT Suite tests from both psychometric and content standpoints and include test section piloting; pretesting of test questions on samples of the suite's test-taking populations; student postexperience surveys and focus groups; timing, SAT concordance, vertical scaling, and predictive and concurrent validity studies; independent state standards alignment studies; curriculum surveys; and cognitive labs. Findings from these various studies have, to date, supported the design decisions behind the digital SAT Suite and served to confirm that the tests are valid, reliable, and fair measures of students' literacy and math achievement in accordance with college and career readiness outcomes.

Construct and content validity evidence. When evaluating what content to measure on the digital SAT Suite tests, College Board drew on several important sources of information. The first such source was what had been assessed on the paper-based SAT Suite, as those tests were themselves firmly based on evidence regarding essential college and career readiness requirements. Curriculum survey data collected from a nationally representative sample of postsecondary educators in various subject areas were also extensively consulted to affirm and refine content selection. Finally, College Board internally examined the alignment between the digital SAT Suite tests' specifications and states' college and career readiness standards to ensure broad and extensive conformity to those expectations, even as the standards vary to some extent from state to state and given that the digital suite is not intended to measure any one set of such standards. This internal alignment study will be supplemented by independent, third-party alignment studies to be conducted in 2022 for the SAT and in 2023 for the PSAT-related assessments. This work, to date, has confirmed that the digital SAT Suite tests measure the important constructs of literacy and math achievement and sample a robust range of skills and knowledge elements closely associated with these constructs.

Subject area evidence. College Board has also continued to document and disseminate findings from high-quality third-party research in support of assessment emphases in the digital SAT Suite. For the Reading and Writing section, these emphases include sustained attention to text complexity; close reading and command of evidence, both textual and quantitative; inference making; high-utility academic (tier two) vocabulary; core Standard English sentence structure, usage, and punctuation conventions; and the literacy demands of a range of academic disciplines (literature, history/social studies, the humanities, and science). In Math, subject area research has strongly influenced the selection of skill/knowledge testing points and the manner in which these points are assessed in the content domains of algebra, advanced math, problem-solving and data analysis, and geometry and trigonometry.

Appendix A: Math Section Taxonomy in Detail

Table 8: Math Section Taxonomy in Detail: Algebra

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Linear equations in one variable	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Identify or create a linear equation in one variable that represents a context. 3. For a linear equation in one variable, interpret a constant, variable, factor, term, or the solution in a context. 4. Solve a linear equation in one variable, making strategic use of algebraic structure. 5. For a linear equation in one variable, determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. 6. Fluently solve a linear equation in one variable.	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Identify or create a linear equation in one variable that represents a context. 3. For a linear equation in one variable, interpret a constant, variable, factor, term, or the solution in a context. 4. Solve a linear equation in one variable, making strategic use of algebraic structure. 5. For a linear equation in one variable, determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. 6. Fluently solve a linear equation in one variable.	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Identify or create a linear equation in one variable that represents a context. 3. For a linear equation in one variable, interpret a constant, variable, factor, term, or the solution in a context. 4. Solve a linear equation in one variable, making strategic use of algebraic structure. 5. Fluently solve a linear equation in one variable.
Linear functions	1. Create and use linear functions to solve problems in a variety of contexts. 2. Identify or create a linear function to model a relationship between two quantities. 3. For a linear function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear function in a context. 5. Make connections between a table, an algebraic representation, or a graph of a linear function not in context.	1. Create and use linear functions to solve problems in a variety of contexts. 2. Identify or create a linear function to model a relationship between two quantities. 3. For a linear function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear function in a context. 5. Make connections between a table, an algebraic representation, or a graph of a linear function not in context.	1. Create and use linear functions to solve problems in a variety of contexts. 2. Identify or create a linear function to model a relationship between two quantities. 3. For a linear function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear function in a context. 5. Make connections between a table, an algebraic representation, or a graph of a linear function not in context.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
	6. Make connections between a table, an algebraic representation, or a graph of a linear function in context.	6. Make connections between a table, an algebraic representation, or a graph of a linear function in context.	6. Make connections between a table, an algebraic representation, or a graph of a linear function in context.
Linear functions *(continued)*	7. For a linear function that represents a context, given an input value, find and interpret the output value using the given representation, or given an output value, find and interpret the input value using the given representation, if it exists. 8. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change. 9. Evaluate a linear function given an input value, or find the input value for a corresponding output.	7. For a linear function that represents a context, given an input value, find and interpret the output value using the given representation, or given an output value, find and interpret the input value using the given representation, if it exists. 8. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change. 9. Evaluate a linear function given an input value, or find the input value for a corresponding output.	7. For a linear function that represents a context, given an input value, find and interpret the output value using the given representation, or given an output value, find and interpret the input value using the given representation, if it exists. 8. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change. 9. Evaluate a linear function given an input value, or find the input value for a corresponding output.
Linear equations in two variables	1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Identify or create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear equation in the form $Ax + By = C$ in a context. 5. Make connections between: a. an algebraic representation and a graph of a linear equation in two variables not in context. b. a table and an algebraic representation or between a table and a graph of a linear equation in two variables not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear equation in two variables in a context.	1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Identify or create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear equation in the form $Ax + By = C$ in a context. 5. Make connections between: a. an algebraic representation and a graph of a linear equation in two variables not in context. b. a table and an algebraic representation or between a table and a graph of a linear equation in two variables not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear equation in two variables in a context.	1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Identify or create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear equation in the form $Ax + By = C$ in a context. 5. Make connections between: a. an algebraic representation and a graph of a linear equation in two variables not in context. b. a table and an algebraic representation or between a table and a graph of a linear equation in two variables not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear equation in two variables in a context.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
	7. For a linear equation in two variables that represents a context, given a value of one quantity in the relationship, find a value of the other, if it exists.	7. For a linear equation in two variables that represents a context, given a value of one quantity in the relationship, find a value of the other, if it exists.	7. For a linear equation in two variables that represents a context, given a value of one quantity in the relationship, find a value of the other, if it exists.
Linear equations in two variables *(continued)*	8. Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	8. Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	8. Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.
Systems of two linear equations in two variables	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Identify or create a system of linear equations in two variables to model constraints or conditions on two quantities. 3. For a system of linear equations in two variables, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 5. For a system of linear equations in two variables, determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. 6. Make connections between an algebraic representation and a graph of a system of linear equations in two variables not in context. 7. Make connections between an algebraic representation and a graph of a system of linear equations in two variables in a context. 8. Fluently solve a system of linear equations in two variables.	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Identify or create a system of linear equations in two variables to model constraints or conditions on two quantities. 3. For a system of linear equations in two variables, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 5. For a system of linear equations in two variables, determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. 6. Make connections between an algebraic representation and a graph of a system of linear equations in two variables not in context. 7. Make connections between an algebraic representation and a graph of a system of linear equations in two variables in a context. 8. Fluently solve a system of linear equations in two variables.	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Identify or create a system of linear equations in two variables to model constraints or conditions on two quantities. 3. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 4. Make connections between an algebraic representation and a graph of a system of linear equations in two variables not in context. 5. Make connections between an algebraic representation and a graph of a system of linear equations in two variables in a context. 6. Fluently solve a system of linear equations in two variables.
Linear inequalities in one or two variables	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts.	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts.	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
	2. Identify or create linear inequalities in one or two variables to model constraints or conditions on two quantities.	2. Identify or create linear inequalities in one or two variables to model constraints or conditions on two quantities.	2. Identify or create linear inequalities in one or two variables to model constraints or conditions on two quantities.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Linear inequalities in one or two variables *(continued)*	3. For linear inequalities in one or two variables, interpret a constant, variable, factor, term, or solution, including situations where seeing structure provides an advantage. 4. Given a linear inequality or system of linear inequalities, interpret a point in the *xy*-plane in terms of the solution set. 5. Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other.	3. For linear inequalities in one or two variables, interpret a constant, variable, factor, term, or solution, including situations where seeing structure provides an advantage. 4. Given a linear inequality or system of linear inequalities, interpret a point in the *xy*-plane in terms of the solution set. 5. Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other.	3. For linear inequalities in one or two variables, interpret a constant, variable, factor, term, or solution, including situations where seeing structure provides an advantage. 4. Given a linear inequality or system of linear inequalities, interpret a point in the *xy*-plane in terms of the solution set.

Table 9: Math Section Taxonomy in Detail: Advanced Math

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Equivalent expressions	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions: a. by factoring polynomials limited to finding a common factor, rewriting binomials that represent a difference of two squares, and rewriting trinomials as the product of two binomials. b. including rewriting simple rational expressions, rewriting expressions with rational exponents in radical form, and factoring polynomials not included in 1a. 2. Fluently add, subtract, and multiply polynomials.	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions by factoring polynomials limited to finding a common factor, rewriting binomials that represent a difference of two squares, and rewriting trinomials as the product of two binomials. 2. Fluently add, subtract, and multiply polynomials.	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions by factoring polynomials limited to finding a common factor, rewriting binomials that represent a difference of two squares, and rewriting trinomials as the product of two binomials. 2. Fluently add, subtract, and multiply polynomials.
Nonlinear equations in one variable and systems of equations in two variables	1. Make strategic use of algebraic structure, the properties of operations, and/or reasoning about equality to solve: a. quadratic equations in one variable presented in a wide variety of forms. b. linear absolute value equations in one variable or simple rational and radical equations in one variable. c. polynomial equations in one variable that are written in factored form. 2. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to solve systems of linear and nonlinear equations in two variables. 3. Determine the conditions under which a quadratic equation has no real solutions, one real solution, or two real solutions. 4. Relate the solutions of a system of a linear and a nonlinear equation in two variables to the graphs of the equations in the system.	1. Make strategic use of algebraic structure, the properties of operations, and/or reasoning about equality to solve: a. quadratic equations in one variable presented in a wide variety of forms. b. linear absolute value equations in one variable or simple rational and radical equations in one variable. 2. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to solve systems of linear and nonlinear equations in two variables. 3. Determine the conditions under which a quadratic equation has no real solutions, one real solution, or two real solutions. 4. Relate the solutions of a system of a linear and a nonlinear equation in two variables to the graphs of the equations in the system.	1. Make strategic use of algebraic structure, the properties of operations, and/or reasoning about equality to solve quadratic equations in one variable presented in a wide variety of forms. 2. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to solve systems of linear and nonlinear equations in two variables. 3. Relate the solutions of a system of a linear and a nonlinear equation in two variables to the graphs of the equations in the system. 4. Given an equation or formula in two or more variables, view it as an equation in a single variable of interest where the other variables are parameters, and solve for the variable of interest.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Nonlinear equations in one variable and systems of equations in two variables *(continued)*	5. Given an equation or formula in two or more variables, view it as an equation in a single variable of interest where the other variables are parameters, and solve for the variable of interest. 6. Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	5. Given an equation or formula in two or more variables, view it as an equation in a single variable of interest where the other variables are parameters, and solve for the variable of interest. 6. Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	5. Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form, where using the quadratic formula or completing the square is the most efficient method for solving the equation.
Nonlinear functions	1. Create and use quadratic or exponential functions to solve problems in a variety of contexts. 2. Identify or create an appropriate quadratic or exponential function to model a relationship between quantities. 3. For a quadratic or exponential function that represents a context: a. interpret the meaning of an input/output pair including an intercept or initial value, including situations where seeing structure provides an advantage. b. interpret the meaning of a constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. For a quadratic or exponential function in a context: a. interpret a point on the graph. b. interpret parts of the graph (other than a point or intercept).	1. Create and use quadratic or exponential functions to solve problems in a variety of contexts. 2. Identify or create an appropriate quadratic or exponential function to model a relationship between quantities. 3. For a quadratic or exponential function that represents a context: a. interpret the meaning of an input/output pair including an intercept or initial value, including situations where seeing structure provides an advantage. b. interpret the meaning of a constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. For a quadratic or exponential function in a context: a. interpret a point on the graph. b. interpret parts of the graph (other than a point or intercept).	1. For a quadratic or exponential function that represents a context, interpret the meaning of an input/output pair including an intercept or initial value, including situations where seeing structure provides an advantage. 2. For a quadratic or exponential function in a context, interpret a point on the graph. 3. Make connections between a table, an algebraic representation, or a graph of a quadratic or exponential function that does not involve a transformation, not in context. 4. Make connections between a table, an algebraic representation, or a graph of a quadratic or exponential function that does not involve a transformation, in a context.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Nonlinear functions *(continued)*	5. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, not in context. b. polynomial function, simple rational function, or quadratic or exponential function that involves a transformation, not in context. 6. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, in a context. b. polynomial function, simple rational function, or other nonlinear function in a context, or a quadratic or exponential function that involves a transformation in a context. 7. Determine the most suitable form of the expression representing the output of the function to display key features for: a. a quadratic function. b. an exponential function. 8. Understand and use the fact that for the graph of $y = f(x)$, the solutions to $f(x) = 0$ correspond to *x*-intercepts of the graph and $f(0)$ corresponds to the *y*-intercept of the graph; make connections between the input/output pairs and points on a graph; interpret this information in a context. 9. Use function notation to represent and interpret input/output pairs: a. evaluate a nonlinear function given an input value; or, for a quadratic function, find the input value for a corresponding output. b. for exponential, polynomial, radical, and rational functions, find the input value for a corresponding output.	5. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, not in context. b. polynomial function, simple rational function, or quadratic or exponential function that involves a transformation, not in context. 6. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, in a context. b. polynomial function, simple rational function, or other nonlinear function in a context, or a quadratic or exponential function that involves a transformation in a context. 7. Determine the most suitable form of the expression representing the output of the function to display key features for: a. a quadratic function. b. an exponential function. 8. Use function notation to represent and interpret input/output pairs: a. evaluate a nonlinear function given an input value; or, for a quadratic function, find the input value for a corresponding output. b. for exponential, polynomial, radical, and rational functions, find the input value for a corresponding output.	5. Use function notation to represent and interpret input/output pairs. Evaluate a nonlinear function given an input value; or, for a quadratic function, find the input value for a corresponding output.

Table 10: Math Section Taxonomy in Detail: Problem-Solving and Data Analysis

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Ratios, rates, proportional relationships, and units	1. Apply proportional relationships, ratios, and rates in a wide variety of contexts. Examples include, but are not limited to, scale drawings and problems in the natural and social sciences. 2. Solve problems involving derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer). 3. Solve problems involving: a. a one-step unit conversion. b. a multistep or multidimensional unit conversion. 4. Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.	1. Apply proportional relationships, ratios, and rates in a wide variety of contexts. Examples include, but are not limited to, scale drawings and problems in the natural and social sciences. 2. Solve problems involving derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer). 3. Solve problems involving: a. a one-step unit conversion. b. a multistep or multidimensional unit conversion. 4. Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.	1. Apply proportional relationships, ratios, and rates in a wide variety of contexts. Examples include, but are not limited to, scale drawings and problems in the natural and social sciences. 2. Solve problems involving derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer). 3. Solve problems involving: a. a one-step unit conversion. b. a multistep or multidimensional unit conversion. 4. Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.
Percentages	1. Use percentages to solve problems in a variety of contexts: a. including, but not limited to, discounts, interest, taxes, and tips. b. including those that involve percent increases and decreases for many different quantities. 2. Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	1. Use percentages to solve problems in a variety of contexts: a. including, but not limited to, discounts, interest, taxes, and tips. b. including those that involve percent increases and decreases for many different quantities. 2. Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	1. Use percentages to solve problems in a variety of contexts: a. including, but not limited to, discounts, interest, taxes, and tips. b. including those that involve percent increases and decreases for many different quantities. 2. Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
One-variable data: Distributions and measures of center and spread	1. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and box plots. 2. For quantitative variables, calculate, compare, and interpret mean, median, and range. 3. Compare distributions using measures of center and spread, including: a. distributions with different means and the same standard deviations. b. distributions with different standard deviations. 4. Understand and describe the effect of outliers on mean and median.	1. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and box plots. 2. For quantitative variables, calculate, compare, and interpret mean, median, and range. 3. Compare distributions using measures of center and spread, including: a. distributions with different means and the same standard deviations. b. distributions with different standard deviations. 4. Understand and describe the effect of outliers on mean and median.	1. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and box plots. 2. For quantitative variables, calculate, compare, and interpret mean, median, and range. 3. Compare distributions using measures of center and spread, including distributions with different means and the same standard deviations. 4. Understand and describe the effect of outliers on mean and median.
Two-variable data: Models and scatterplots	1. Analyze and interpret data represented in a scatterplot, but do not make predictions. 2. Analyze and interpret data represented in a scatterplot to make predictions. 3. Fit linear models to data represented in a scatterplot. 4. Fit quadratic and exponential models to data represented in a scatterplot. 5. Given a relationship between two quantities, read and interpret graphs modeling the relationship. 6. Compare linear and exponential growth.	1. Analyze and interpret data represented in a scatterplot, but do not make predictions. 2. Analyze and interpret data represented in a scatterplot to make predictions. 3. Fit linear models to data represented in a scatterplot. 4. Fit quadratic and exponential models to data represented in a scatterplot. 5. Given a relationship between two quantities, read and interpret graphs modeling the relationship. 6. Compare linear and exponential growth.	1. Analyze and interpret data represented in a scatterplot, but do not make predictions. 2. Fit linear models to data represented in a scatterplot. 3. Given a relationship between two quantities, read and interpret graphs modeling the relationship.
Probability and conditional probability	Use one- and two-way tables, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. 1. Calculate, express, or interpret the probability or conditional probability of an event using a data display showing frequencies for a single variable, a two-way table, an area model, or a description of a situation. Infrequently, given a probability, determine an unknown number in a data display showing frequencies for a single variable, a two-way table, or a description of a situation, including using a probability to determine the frequency of an event.	Use one- and two-way tables, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. 1. Calculate, express, or interpret the probability or conditional probability of an event using a data display showing frequencies for a single variable, a two-way table, an area model, or a description of a situation. Infrequently, given a probability, determine an unknown number in a data display showing frequencies for a single variable, a two-way table, or a description of a situation, including using a probability to determine the frequency of an event.	Use one- and two-way tables, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. 1. Calculate, express, or interpret the probability or conditional probability of an event using a data display showing frequencies for a single variable, a two-way table, an area model, or a description of a situation. Infrequently, given a probability, determine an unknown number in a data display showing frequencies for a single variable, a two-way table, or a description of a situation, including using a probability to determine the frequency of an event.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Inference from sample statistics and margin of error	1. Use sample mean and sample proportion to estimate population mean and population proportion. 2. Interpret margin of error. Understand that a larger sample size generally leads to a smaller margin of error.	1. Use sample mean and sample proportion to estimate population mean and population proportion.	
Evaluating statistical claims: Observational studies and experiments	1. With random samples, identify or describe which population the results can be extended to. Given a description of a study with or without random assignment, determine whether there is evidence for a causal relationship. 2. Understand why random assignment provides evidence for a causal relationship in an experimental study. 3. Understand issues related to sampling methods and why a result can be extended only to the population from which the sample was selected.		

Table 11: Math Section Taxonomy in Detail: Geometry (and Trigonometry)

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Area and volume	1. Solve real-world and mathematical problems about the: a. area or perimeter of a geometric figure or an object that can be modeled by a geometric figure using given information. b. surface area or volume of a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. 2. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3 . 3. Demonstrate procedural fluency by selecting the correct: a. area formula and correctly calculating a specified value. b. surface area or volume formula and correctly calculating a specified value.	1. Solve real-world and mathematical problems about the: a. area or perimeter of a geometric figure or an object that can be modeled by a geometric figure using given information. b. surface area or volume of a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. 2. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3. 3. Demonstrate procedural fluency by selecting the correct: a. area formula and correctly calculating a specified value. b. surface area or volume formula and correctly calculating a specified value.	1. Solve real-world and mathematical problems about the: a. area or perimeter of a geometric figure or an object that can be modeled by a geometric figure using given information. b. surface area or volume of a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. 2. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3. 3. Demonstrate procedural fluency by selecting the correct: a. area formula and correctly calculating a specified value. b. surface area or volume formula and correctly calculating a specified value.
Lines, angles, and triangles	1. Use concepts and theorems relating to congruence and similarity of triangles to solve problems. 2. Determine which statements may be required to prove certain relationships or to satisfy a given theorem. 3. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. 4. Know and directly apply relevant theorems such as the: a. triangle angle sum theorem. b. vertical angle theorem and the relationship of angles formed when a transversal cuts parallel lines.	1. Use concepts and theorems relating to congruence and similarity of triangles to solve problems. 2. Determine which statements may be required to prove certain relationships or to satisfy a given theorem. 3. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. 4. Know and directly apply relevant theorems such as the: a. triangle angle sum theorem. b. vertical angle theorem and the relationship of angles formed when a transversal cuts parallel lines.	1. Know and directly apply the triangle angle sum theorem.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Right triangles and trigonometry	1. Solve problems in a variety of contexts using: a. the Pythagorean theorem. b. properties of special right triangles. c. right triangle trigonometry. 2. Use similarity to calculate values of sine, cosine, and tangent. 3. Solve problems using the relationship between sine and cosine of complementary angles.	1. Solve problems in a variety of contexts using: a. the Pythagorean theorem. b. properties of special right triangles. c. right triangle trigonometry.	1. Solve problems in a variety of contexts using the Pythagorean theorem.
Circles	1. Use definitions, properties, and theorems relating to circles and parts of circles such as radii, diameters, tangents, angles, arc lengths, and sector areas to solve problems. 2. Solve problems using either radian measure or trigonometric ratios in the unit circle. 3. Create an equation to represent a circle in the *xy*-plane. 4. Describe how a change to the equation representing a circle affects the graph of the circle in the *xy*-plane or how a change to the graph of a circle affects the equation that represents the circle. 5. Understand that the ordered pairs that satisfy an equation of the form $(x-h)^2+(y-k)^2=r^2$ form a circle when plotted in the *xy*-plane. 6. Convert between angle measures in degrees and radians. 7. Complete the square in an equation representing a circle to determine properties of the circle when it is graphed in the *xy*-plane and use the distance formula in problems related to circles.		

Appendix B: Alignments of ELA/L Standards to Digital SAT Suite

The following tables detail the Connecticut Core Standards–digital SAT Suite alignments using the standards as the organizing principle.

Table 12: Anchor Standards in Reading, Writing, and Language Aligned to Digital SAT

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading	R.CCR.1	Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.	✓	✓	✓							
Reading	R.CCR.2	Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.	✓									
Reading	R.CCR.3	Analyze how and why individuals, events, and ideas develop and interact over the course of a text.	✓	✓			✓					
Reading	R.CCR.4	Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.	✓	✓		✓						
Reading	R.CCR.5	Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.					✓					
Reading	R.CCR.6	Assess how point of view or purpose shapes the content and style of a text.					✓	✓				
Reading	R.CCR.7	Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.			✓							

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading	R.CCR.8	Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.	✓	✓	✓							
Reading	R.CCR.9	Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.						✓				
Reading	R.CCR.10	Read and comprehend complex literary and informational texts independently and proficiently.	✓	✓	✓	✓	✓	✓				
Writing	W.CCR.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.							✓	✓		
Writing	W.CCR.2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.							✓	✓		
Writing	W.CCR.3	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.										
Writing	W.CCR.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		
Writing	W.CCR.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.							✓	✓	✓	✓
Writing	W.CCR.6	Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.										
Writing	W.CCR.7	Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.CCR.8	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.										
Writing	W.CCR.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.							✓			
Writing	W.CCR.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.										
Language	L.CCR.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.									✓	✓
Language	L.CCR.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.									✓	✓
Language	L.CCR.3	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.	✓	✓		✓			✓	✓		
Language	L.CCR.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.	✓	✓		✓						
Language	L.CCR.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.	✓	✓		✓			✓	✓		
Language	L.CCR.6	Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	✓	✓		✓			✓	✓		

Table 13: Grades 11–12 Standards Aligned to Digital SAT and Digital PSAT/NMSQT and PSAT 10

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Literature	RL.11-12.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain	✓		✓							
Reading Literature	RL.11-12.2	Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.										
Reading Literature	RL.11-12.3	Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).	✓				✓					
Reading Literature	RL.11-12.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)	✓			✓						
Reading Literature	RL.11-12.5	Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.					✓					
Reading Literature	RL.11-12.6	Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Literature	RL.11-12.7	Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)										
Reading Literature	RL.11-12.8	(Not applicable to literature)										
Reading Literature	RL.11-12.9	Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.										
Reading Literature	RL.11-12.10	By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11–CCR text complexity band independently and proficiently.	✓		✓	✓	✓					
Reading Informational Text	RI.11-12.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	✓	✓	✓							
Reading Informational Text	RI.11-12.2	Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.										
Reading Informational Text	RI.11-12.3	Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.	✓	✓			✓					

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Informational Text	RI.11-12.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).	✓	✓		✓						
Reading Informational Text	RI.11-12.5	Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.					✓					
Reading Informational Text	RI.11-12.6	Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.					✓	✓				
Reading Informational Text	RI.11-12.7	Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.			✓							
Reading Informational Text	RI.11-12.8	Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).										
Reading Informational Text	RI.11-12.9	Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Informational Text	RI.11-12.10	By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently	✓	✓	✓	✓	✓	✓				
Writing	W.11-12.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.11-12.2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.11-12.3	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution). d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.										
Writing	W.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		
Writing	W.11-12.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.							✓	✓	✓	✓

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.11-12.6	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.										
Writing	W.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.										
Writing	W.11-12.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.										
Writing	W.11-12.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply grades 11–12 Reading standards to literature (e.g., “Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics”). b. Apply grades 11–12 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning [e.g., in U.S. Supreme Court Case majority opinions and dissents] and the premises, purposes, and arguments in works of public advocacy [e.g., The Federalist, presidential addresses]”).							✓			

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.11-12.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.										
Language	L.11-12.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested. b. Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster's Dictionary of English Usage, Garner's Modern American Usage) as needed.									✓	✓
Language	L.11-12.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Observe hyphenation conventions. b. Spell correctly.									✓	✓
Language	L.11-12.3	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. a. Vary syntax for effect, consulting references (e.g., Tufte's Artful Sentences) for guidance as needed; apply an understanding of syntax to the study of complex texts when reading.	✓	✓		✓			✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language	L.11-12.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	✓	✓		✓						
Language	L.11-12.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text. b. Analyze nuances in the meaning of words with similar denotations.	✓	✓		✓			✓	✓		
Language	L.11-12.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	✓	✓		✓			✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language Progressive	L.3.1f progressive	Ensure subject-verb and pronoun-antecedent agreement.										✓
Language Progressive	L.3.3a progressive	Choose words and phrases for effect.				✓			✓	✓		
Language Progressive	L.4.1f progressive	Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.									✓	
Language Progressive	L.4.1g progressive	Correctly use frequently confused words (e.g., to/too/two; there/their).										✓
Language Progressive	L.4.3b progressive	Choose punctuation for effect.									✓	
Language Progressive	L.5.1d progressive	Recognize and correct inappropriate shifts in verb tense.										✓
Language Progressive	L.6.1c progressive	Recognize and correct inappropriate shifts in pronoun number and person.										✓
Language Progressive	L.6.1d progressive	Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents)										✓
Language Progressive	L.6.1e progressive	Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.									✓	✓
Language Progressive	L.6.2a progressive	Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.									✓	
Language Progressive	L.6.3b progressive	Maintain consistency in style and tone.										
Language Progressive	L.7.1c progressive	Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.										✓
Language Progressive	L.7.3a progressive	Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.				✓			✓			
Language Progressive	L.8.1d progressive	Recognize and correct inappropriate shifts in verb voice and mood.										✓
Language Progressive	L.9-10.1a progressive	Use parallel structure.										✓

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading - Literacy in History/Social Studies	RH.11-12.1	Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.	✓	✓	✓							
Reading - Literacy in History/Social Studies	RH.11-12.2	Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.	✓									
Reading - Literacy in History/Social Studies	RH.11-12.3	Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.	✓	✓	✓		✓					
Reading - Literacy in History/Social Studies	RH.11-12.4	Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).	✓	✓		✓						
Reading - Literacy in History/Social Studies	RH.11-12.5	Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole.										
Reading - Literacy in History/Social Studies	RH.11-12.6	Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.						✓				
Reading - Literacy in History/Social Studies	RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.			✓							
Reading - Literacy in History/Social Studies	RH.11-12.8	Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information.	✓	✓	✓							
Reading - Literacy in History/Social Studies	RH.11-12.9	Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.						✓				

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading - Literacy in History/Social Studies	RH.11-12.10	By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				
Reading - Literacy in Science and Technical Subjects	RST.11-12.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.	✓	✓	✓							
Reading - Literacy in Science and Technical Subjects	RST.11-12.2	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	✓									
Reading - Literacy in Science and Technical Subjects	RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.										
Reading - Literacy in Science and Technical Subjects	RST.11-12.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.	✓	✓								
Reading - Literacy in Science and Technical Subjects	RST.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.					✓					
Reading - Literacy in Science and Technical Subjects	RST.11-12.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.					✓					
Reading - Literacy in Science and Technical Subjects	RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.			✓							

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading - Literacy in Science and Technical Subjects	RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.	✓	✓	✓							
Reading - Literacy in Science and Technical Subjects	RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.						✓				
Reading - Literacy in Science and Technical Subjects	RST.11-12.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.1	Write arguments focused on discipline-specific content. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).							✓	✓		
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.3	(Not applicable as a separate requirement)										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.							✓	✓	✓	✓
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.6	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.							✓			
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.11-12.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.										

Table 14: Grades 9–10 Standards Aligned to Digital PSAT/NMSQT and PSAT 10 and Digital PSAT 8/9

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Literature	RL.9-10.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	✓		✓							
Reading Literature	RL.9-10.2	Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	✓									
Reading Literature	RL.9-10.3	Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme.	✓				✓					
Reading Literature	RL.9-10.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone).	✓			✓						
Reading Literature	RL.9-10.5	Analyze how an author's choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise.					✓					
Reading Literature	RL.9-10.6	Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature.										
Reading Literature	RL.9-10.7	Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (e.g., Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus).										
Reading Literature	RL.9-10.8	(Not applicable to literature)										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Literature	RL.9-10.9	Analyze how an author draws on and transforms source material in a specific work (e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare).										
Reading Literature	RL.9-10.10	By the end of grade 9, read and comprehend literature, including stories, dramas, and poems, in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 9–10 text complexity band independently and proficiently.	✓		✓	✓	✓					
Reading Informational Text	RI.9-10.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	✓	✓	✓							
Reading Informational Text	RI.9-10.2	Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	✓									
Reading Informational Text	RI.9-10.3	Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.	✓	✓			✓					
Reading Informational Text	RI.9-10.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).	✓	✓		✓						
Reading Informational Text	RI.9-10.5	Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).					✓					

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Informational Text	RI.9-10.6	Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.					✓	✓				
Reading Informational Text	RI.9-10.7	Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.										
Reading Informational Text	RI.9-10.8	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.	✓	✓	✓							
Reading Informational Text	RI.9-10.9	Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.										
Reading Informational Text	RI.9-10.10	By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9–10 text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.9-10.2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.9-10.3	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole. d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.										
Writing	W.9-10.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		
Writing	W.9-10.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.							✓	✓	✓	✓
Writing	W.9-10.6	Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.9-10.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.										
Writing	W.9-10.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.										
Writing	W.9-10.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply grades 9–10 Reading standards to literature (e.g., “Analyze how an author draws on and transforms source material in a specific work [e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare]”). b. Apply grades 9–10 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning”).							✓			
Writing	W.9-10.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language	L.9-10.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Use parallel structure. b. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations.									✓	✓
Language	L.9-10.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses. b. Use a colon to introduce a list or quotation. c. Spell correctly.									✓	✓
Language	L.9-10.3	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. a. Write and edit work so that it conforms to the guidelines in a style manual (e.g., MLA Handbook, Turabian's Manual for Writers) appropriate for the discipline and writing type.	✓	✓		✓			✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language	L.9-10.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., analyze, analysis, analytical; advocate, advocacy). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	✓	✓		✓						
Language	L.9-10.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g., euphemism, oxymoron) in context and analyze their role in the text. b. Analyze nuances in the meaning of words with similar denotations.	✓	✓		✓			✓	✓		
Language	L.9-10.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	✓	✓		✓			✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language Progressive	L.3.1f progressive	Ensure subject-verb and pronoun-antecedent agreement.										✓
Language Progressive	L.3.3a progressive	Choose words and phrases for effect.				✓			✓	✓		
Language Progressive	L.4.1f progressive	Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.									✓	
Language Progressive	L.4.1g progressive	Correctly use frequently confused words (e.g., to/too/two; there/their).										✓
Language Progressive	L.4.3b progressive	Choose punctuation for effect.									✓	
Language Progressive	L.5.1d progressive	Recognize and correct inappropriate shifts in verb tense.										✓
Language Progressive	L.6.1c progressive	Recognize and correct inappropriate shifts in pronoun number and person.										✓
Language Progressive	L.6.1d progressive	Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents)										✓
Language Progressive	L.6.1e progressive	Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.									✓	✓
Language Progressive	L.6.2a progressive	Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.									✓	
Language Progressive	L.6.3a progressive	Vary sentence patterns for meaning, reader/listener interest, and style.							✓			
Language Progressive	L.6.3b progressive	Maintain consistency in style and tone.										
Language Progressive	L.7.1c progressive	Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.										✓
Language Progressive	L.7.3a progressive	Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.				✓			✓			
Language Progressive	L.8.1d progressive	Recognize and correct inappropriate shifts in verb voice and mood.										✓

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading- Literacy in History/Social Studies	RH.9-10.1	Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.	✓	✓	✓							
Reading- Literacy in History/Social Studies	RH.9-10.2	Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.	✓									
Reading- Literacy in History/Social Studies	RH.9-10.3	Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.	✓	✓			✓					
Reading- Literacy in History/Social Studies	RH.9-10.4	Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social studies.	✓	✓		✓						
Reading- Literacy in History/Social Studies	RH.9-10.5	Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.					✓					
Reading- Literacy in History/Social Studies	RH.9-10.6	Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.						✓				
Reading- Literacy in History/Social Studies	RH.9-10.7	Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.			✓							
Reading- Literacy in History/Social Studies	RH.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claims.	✓	✓	✓							
Reading- Literacy in History/Social Studies	RH.9-10.9	Compare and contrast treatments of the same topic in several primary and secondary sources.						✓				
Reading- Literacy in History/Social Studies	RH.9-10.10	By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				
Reading - Literacy in Science and Technical Subjects	RST.9-10.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	✓	✓	✓							

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading - Literacy in Science and Technical Subjects	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.	✓									
Reading - Literacy in Science and Technical Subjects	RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.										
Reading - Literacy in Science and Technical Subjects	RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.	✓	✓								
Reading - Literacy in Science and Technical Subjects	RST.9-10.5	Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).					✓					
Reading - Literacy in Science and Technical Subjects	RST.9-10.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.					✓					
Reading - Literacy in Science and Technical Subjects	RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.			✓							
Reading - Literacy in Science and Technical Subjects	RST.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.	✓	✓	✓							
Reading - Literacy in Science and Technical Subjects	RST.9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.										
Reading - Literacy in Science and Technical Subjects	RST.9-10.10	By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.1	Write arguments focused on discipline-specific content. a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).							✓	✓		
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.3	(Not applicable as a separate requirement)										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.5	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.							✓	✓	✓	✓
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.6	Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.9	Draw evidence from informational texts to support analysis, reflection, and research.							✓			

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.9-10.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.										

Table 15: Grade 8/Literacy 6–8 Standards Aligned to Digital PSAT 8/9

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Literature	RL.8.1	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	✓		✓							
Reading Literature	RL.8.2	Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.	✓									
Reading Literature	RL.8.3	Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.	✓				✓					
Reading Literature	RL.8.4	Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	✓			✓						
Reading Literature	RL.8.5	Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.										
Reading Literature	RL.8.6	Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.										
Reading Literature	RL.8.7	Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors.										
Reading Literature	RL.8.8	(Not applicable to literature)										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Literature	RL.8.9	Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.										
Reading Literature	RL.8.10	By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6–8 text complexity band independently and proficiently.	✓		✓	✓	✓					
Reading Informational Text	RI.8.1	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	✓	✓	✓							
Reading Informational Text	RI.8.2	Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.	✓									
Reading Informational Text	RI.8.3	Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).	✓	✓			✓					
Reading Informational Text	RI.8.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts	✓	✓		✓						
Reading Informational Text	RI.8.5	Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.					✓					
Reading Informational Text	RI.8.6	Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.					✓	✓				

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading Informational Text	RI.8.7	Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.										
Reading Informational Text	RI.8.8	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.	✓	✓	✓							
Reading Informational Text	RI.8.9	Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.						✓				
Reading Informational Text	RI.8.10	By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				
Writing	W.8.1	Write arguments to support claims with clear reasons and relevant evidence. a. Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.8.2	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style. f. Provide a concluding statement or section that follows from and supports the information or explanation presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.8.3	Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences. a. Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically. b. Use narrative techniques, such as dialogue, pacing, description, and reflection, to develop experiences, events, and/or characters. c. Use a variety of transition words, phrases, and clauses to convey sequence, signal shifts from one time frame or setting to another, and show the relationships among experiences and events. d. Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events. e. Provide a conclusion that follows from and reflects on the narrated experiences or events.										
Writing	W.8.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		
Writing	W.8.5	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.							✓	✓	✓	✓
Writing	W.8.6	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing	W.8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.										
Writing	W.8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.										
Writing	W.8.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply grade 8 Reading standards to literature (e.g., “Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new”). b. Apply grade 8 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced”).							✓			
Writing	W.8.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.										

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language	L.8.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Explain the function of verbals (gerunds, participles, infinitives) in general and their function in particular sentences. b. Form and use verbs in the active and passive voice. c. Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood. d. Recognize and correct inappropriate shifts in verb voice and mood.									✓	✓
Language	L.8.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use punctuation (comma, ellipsis, dash) to indicate a pause or break. b. Use an ellipsis to indicate an omission. c. Spell correctly.									✓	✓
Language	L.8.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening. a. Use verbs in the active and passive voice and in the conditional and subjunctive mood to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact).	✓	✓		✓			✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language	L.8.4	Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., precede, recede, secede). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	✓	✓		✓						
Language	L.8.5	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g. verbal irony, puns) in context. b. Use the relationship between particular words to better understand each of the words. c. Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., bullheaded, willful, firm, persistent, resolute).	✓	✓		✓			✓	✓		
Language	L.8.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.	✓	✓		✓			✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Language Progressive	L.3.1f progressive	Ensure subject-verb and pronoun-antecedent agreement.										✓
Language Progressive	L.3.3a progressive	Choose words and phrases for effect.				✓			✓	✓		
Language Progressive	L.4.1f progressive	Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.									✓	
Language Progressive	L.4.1g progressive	Correctly use frequently confused words (e.g., to/too/two; there/their).										✓
Language Progressive	L.4.3b progressive	Choose punctuation for effect.									✓	
Language Progressive	L.5.1d progressive	Recognize and correct inappropriate shifts in verb tense.										✓
Language Progressive	L.5.2a progressive	Use punctuation to separate items in a series.									✓	
Language Progressive	L.6.1c progressive	Recognize and correct inappropriate shifts in pronoun number and person.										✓
Language Progressive	L.6.1d progressive	Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents)										✓
Language Progressive	L.6.1e progressive	Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.									✓	✓
Language Progressive	L.6.2a progressive	Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.									✓	
Language Progressive	L.6.3a progressive	Vary sentence patterns for meaning, reader/listener interest, and style.							✓			
Language Progressive	L.6.3b progressive	Maintain consistency in style and tone.										
Language Progressive	L.7.1c progressive	Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.										✓
Language Progressive	L.7.3a progressive	Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.				✓			✓			
Reading- Literacy in History/Social Studies	RH.6-8.1	Cite specific textual evidence to support analysis of primary and secondary sources.	✓	✓	✓							

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading- Literacy in History/Social Studies	RH.6-8.2	Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.	✓									
Reading- Literacy in History/Social Studies	RH.6-8.3	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).	✓	✓			✓					
Reading- Literacy in History/Social Studies	RH.6-8.4	Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.	✓	✓		✓						
Reading- Literacy in History/Social Studies	RH.6-8.5	Describe how a text presents information (e.g., sequentially, comparatively, causally).					✓					
Reading- Literacy in History/Social Studies	RH.6-8.6	Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).					✓	✓				
Reading- Literacy in History/Social Studies	RH.6-8.7	Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.			✓							
Reading- Literacy in History/Social Studies	RH.6-8.8	Distinguish among fact, opinion, and reasoned judgment in a text.	✓	✓	✓							
Reading- Literacy in History/Social Studies	RH.6-8.9	Analyze the relationship between a primary and secondary source on the same topic.										
Reading- Literacy in History/Social Studies	RH.6-8.10	By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				
Reading - Literacy in Science and Technical Subjects	RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.	✓	✓	✓							
Reading - Literacy in Science and Technical Subjects	RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	✓									

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Reading - Literacy in Science and Technical Subjects	RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.										
Reading - Literacy in Science and Technical Subjects	RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.	✓	✓								
Reading - Literacy in Science and Technical Subjects	RST.6-8.5	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.					✓					
Reading - Literacy in Science and Technical Subjects	RST.6-8.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.					✓					
Reading - Literacy in Science and Technical Subjects	RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).			✓							
Reading - Literacy in Science and Technical Subjects	RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.	✓	✓	✓							
Reading - Literacy in Science and Technical Subjects	RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.										
Reading - Literacy in Science and Technical Subjects	RST.6-8.10	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.1	Write arguments focused on discipline-specific content. a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.							✓	✓		
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.2	Write arguments focused on discipline-specific content. a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.							✓	✓		

Connecticut Core Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.3	(Not applicable as a separate requirement)										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.							✓	✓		
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.5	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.							✓	✓	✓	✓
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.6	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.										
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.9	Draw evidence from informational texts to support analysis reflection, and research.							✓			
Writing - Literacy in History/Social Studies, Science, and Technical Subjects	WHST.6-8.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.										

Appendix C: Alignments of Math Standards to Digital SAT Suite

The following tables detail the Connecticut Core Standards–digital SAT Suite alignments using the standards as the organizing principle.

Table 16: Algebra I Aligned to Digital SAT

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
The Real Number System	N-RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.																			
The Real Number System	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.						✓													
The Real Number System	N-RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Quantities	N-Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.									✓										
Quantities	N-Q.2	Define appropriate quantities for the purpose of descriptive modeling.																			
Quantities	N-Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.																			
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓											
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓												

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Seeing Structure in Expressions	A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.						✓		✓											
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓													
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓											
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓											
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓												
Reasoning with Equations and Inequalities	A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	✓		✓	✓	✓		✓	✓											
Reasoning with Equations and Inequalities	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	✓				✓				✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Reasoning with Equations and Inequalities	A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.							✓												
Reasoning with Equations and Inequalities	A-REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.																			
Reasoning with Equations and Inequalities	A-REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				✓															

Connectical Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Reasoning with Equations and Inequalities	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.							✓												
Reasoning with Equations and Inequalities	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		✓	✓					✓											
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Reasoning with Equations and Inequalities	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					✓														
Interpreting Functions	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.		✓						✓											
Interpreting Functions	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		✓						✓											
Interpreting Functions	F-IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓											
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓																	
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓											
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓											
Building Functions	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.																			
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																			
Linear, Quadratic, and Exponential Models	F-LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.		✓						✓				✓							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Linear, Quadratic, and Exponential Models	F-LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		✓						✓											
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓				✓							
Linear, Quadratic, and Exponential Models	F-LE.5	Interpret the parameters in a linear or exponential function in terms of a context.		✓						✓											
Interpreting Categorical and Quantitative Data	S-ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).											✓								
Interpreting Categorical and Quantitative Data	S-ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.											✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Categorical and Quantitative Data	S-ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).											✓								
Interpreting Categorical and Quantitative Data	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.													✓						

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Categorical and Quantitative Data	S-ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.												✓							
Interpreting Categorical and Quantitative Data	S-ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.												✓							
Interpreting Categorical and Quantitative Data	S-ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Categorical and Quantitative Data	S-ID.9	Distinguish between correlation and causation.																			

Table 17: Geometry Aligned to Digital SAT

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.																	✓	✓	
Congruence	G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).																			
Congruence	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.																			
Congruence	G-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.																			
Congruence	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.																			
Congruence	G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.																			
Congruence	G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.																	✓		

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.																	√		
Congruence	G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.																	√		
Congruence	G-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.																	√		

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.																				
Congruence	G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.																				
Similarity, Right Triangles, and Trigonometry	G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.																✓	✓		

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Similarity, Right Triangles, and Trigonometry	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.																			
Similarity, Right Triangles, and Trigonometry	G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.																			
Similarity, Right Triangles, and Trigonometry	G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.																	✓	✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.																	✓		
Similarity, Right Triangles, and Trigonometry	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.																		✓	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Similarity, Right Triangles, and Trigonometry	G-SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.																		✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.																		✓	
Circles	G-C.1	Prove that all circles are similar.																			
Circles	G-C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.																			
Circles	G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.																			
Circles	G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Expressing Geometric Properties with Equations	G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.																			
Expressing Geometric Properties with Equations	G-GPE.2	Derive the equation of a parabola given a focus and directrix.																			
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																			
Expressing Geometric Properties with Equations	G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).			✓																
Expressing Geometric Properties with Equations	G-GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Expressing Geometric Properties with Equations	G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.																✓			
Geometric Measurement and Dimension	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.																			
Geometric Measurement and Dimension	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.																✓			
Geometric Measurement and Dimension	G-GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two- dimensional objects.																			
Modeling with Geometry	G-MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).																✓			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Modeling with Geometry	G-MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).									✓										
Modeling with Geometry	G-MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).																			
Conditional Probability and the Rules of Probability	S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).													✓						
Conditional Probability and the Rules of Probability	S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Conditional Probability and the Rules of Probability	S-CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.																				
Conditional Probability and the Rules of Probability	S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.													✓						

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Conditional Probability and the Rules of Probability	S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.																			
Conditional Probability and the Rules of Probability	S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.													✓						
Conditional Probability and the Rules of Probability	S-CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.													✓						

Table 18: Algebra II Aligned to Digital SAT

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Complex Number System	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.																			
Complex Number System	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.																			
Complex Number System	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.																			
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓												
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓											
Seeing Structure in Expressions	A-SSE.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓													
Arithmetic with Polynomials and Rational Expressions	A-APR.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.																			
Arithmetic with Polynomials and Rational Expressions	A-APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.								✓											
Arithmetic with Polynomials and Rational Expressions	A-APR.4	Prove polynomial identities and use them to describe numerical relationships.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Arithmetic with Polynomials and Rational Expressions	A-APR.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.						✓													
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓											
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓											
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓												
Reasoning with Equations and Inequalities	A-REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.							✓												
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓											
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓																	
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓											
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓											
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																				
Linear, Quadratic, and Exponential Models	F-LE.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.																				
Trigonometric Functions	F-TF.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.																				
Trigonometric Functions	F-TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.																				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Trigonometric Functions	F-TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.																			
Trigonometric Functions	F-TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.																			
Interpreting Categorical and Quantitative Data	S-ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.														✓					
Making Inferences and Justifying Conclusions	S-IC.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.														✓					

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Making Inferences and Justifying Conclusions	S-IC.2	Decide if a specified model is consistent with results from a given data- generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?																			
Making Inferences and Justifying Conclusions	S-IC.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.																			
Making Inferences and Justifying Conclusions	S-IC.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.																			
Making Inferences and Justifying Conclusions	S-IC.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.																			
Making Inferences and Justifying Conclusions	S-IC.6	Evaluate reports based on data.																			

Table 19: Mathematics I Aligned to Digital SAT

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Quantities	N-Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.									✓										
Quantities	N-Q.2	Define appropriate quantities for the purpose of descriptive modeling.																			
Quantities	N-Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.																			
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓											
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓											
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓											
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓												
Reasoning with Equations and Inequalities	A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	✓		✓	✓	✓		✓	✓											
Reasoning with Equations and Inequalities	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	✓				✓				✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Reasoning with Equations and Inequalities	A-REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.																			
Reasoning with Equations and Inequalities	A-REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				✓															
Reasoning with Equations and Inequalities	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		✓	✓					✓											
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Reasoning with Equations and Inequalities	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					✓														
Interpreting Functions	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.		✓						✓											
Interpreting Functions	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		✓						✓											
Interpreting Functions	F-IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓											
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓																	
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓											
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓											
Building Functions	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\ f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓											
Linear, Quadratic, and Exponential Models	F-LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.		✓						✓				✓							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Linear, Quadratic, and Exponential Models	F-LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		✓						✓											
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓				✓							
Linear, Quadratic, and Exponential Models	F-LE.5	Interpret the parameters in a linear or exponential function in terms of a context.		✓						✓											
Congruence	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.																	✓	✓	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).																			
Congruence	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.																			
Congruence	G-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.																			
Congruence	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.																			
Congruence	G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.																			
Congruence	G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.																	✓		
Congruence	G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.																			
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																			
Expressing Geometric Properties with Equations	G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).			✓																
Expressing Geometric Properties with Equations	G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.																✓			
Interpreting Categorical and Quantitative Data	S-ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).											✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Categorical and Quantitative Data	S-ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.											✓								
Interpreting Categorical and Quantitative Data	S-ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).											✓								
Interpreting Categorical and Quantitative Data	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.													✓						

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Categorical and Quantitative Data	S-ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.												✓							
Interpreting Categorical and Quantitative Data	S-ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.												✓							
Interpreting Categorical and Quantitative Data	S-ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Categorical and Quantitative Data	S-ID.9	Distinguish between correlation and causation.																			

Table 20: Mathematics II Aligned to Digital SAT

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
The Real Number System	N-RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.																			
The Real Number System	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.						✓													
The Real Number System	N-RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.																			
Complex Number System	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.																			
Complex Number System	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Complex Number System	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.																			
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓												
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓											
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓												

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Seeing Structure in Expressions	A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.						✓		✓											
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓													
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓											
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓												
Reasoning with Equations and Inequalities	A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.							✓												

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Reasoning with Equations and Inequalities	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.							√												
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		√						√											
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		√																	
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			√									√							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓											
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓											
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																			
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓				✓							
Trigonometric Functions	F-TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Congruence	G-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.																	✓		
Congruence	G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.																	✓		
Congruence	G-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.																	✓		

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Similarity, Right Triangles, and Trigonometry	G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.																✓	✓		
Similarity, Right Triangles, and Trigonometry	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.																			
Similarity, Right Triangles, and Trigonometry	G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Similarity, Right Triangles, and Trigonometry	G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.																	✓	✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.																	✓		
Similarity, Right Triangles, and Trigonometry	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.																		✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.																		✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.																		✓	
Circles	G-C.1	Prove that all circles are similar.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Circles	G-C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.																			
Circles	G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.																			
Circles	G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.																			
Expressing Geometric Properties with Equations	G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.																			
Expressing Geometric Properties with Equations	G-GPE.2	Derive the equation of a parabola given a focus and directrix.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																			
Geometric Measurement and Dimension	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.																			
Geometric Measurement and Dimension	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.																✓			
Conditional Probability and the Rules of Probability	S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").													✓						

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Conditional Probability and the Rules of Probability	S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.																			
Conditional Probability and the Rules of Probability	S-CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Conditional Probability and the Rules of Probability	S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.													✓						
Conditional Probability and the Rules of Probability	S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.																			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Conditional Probability and the Rules of Probability	S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.													✓						
Conditional Probability and the Rules of Probability	S-CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.													✓						

Table 21: Algebra I Aligned to Digital PSAT/NMSQT and PSAT 10

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
The Real Number System	N-RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.																	
The Real Number System	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.						✓											
The Real Number System	N-RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.																	
Quantities	N-Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.									✓								
Quantities	N-Q.2	Define appropriate quantities for the purpose of descriptive modeling.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Quantities	N-Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.																	
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓									
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓										
Seeing Structure in Expressions	A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.						✓		✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓											
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓									
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓									
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓									
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	✓		✓	✓	✓		✓	✓									
Reasoning with Equations and Inequalities	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	✓				✓				✓								
Reasoning with Equations and Inequalities	A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.							✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.																	
Reasoning with Equations and Inequalities	A-REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				√													
Reasoning with Equations and Inequalities	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.							√										
Reasoning with Equations and Inequalities	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		√	√					√									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																	
Reasoning with Equations and Inequalities	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					✓												

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.		✓						✓									
Interpreting Functions	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		✓						✓									
Interpreting Functions	F-IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓									
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓															
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓					

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓									
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓									
Building Functions	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓									
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Linear, Quadratic, and Exponential Models	F-LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.		✓						✓				✓					
Linear, Quadratic, and Exponential Models	F-LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		✓						✓									
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓				✓					

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Linear, Quadratic, and Exponential Models	F-LE.5	Interpret the parameters in a linear or exponential function in terms of a context.		✓						✓									
Interpreting Categorical and Quantitative Data	S-ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).											✓						
Interpreting Categorical and Quantitative Data	S-ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.											✓						
Interpreting Categorical and Quantitative Data	S-ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).											✓						
Interpreting Categorical and Quantitative Data	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.													✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Categorical and Quantitative Data	S-ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.												✓					
Interpreting Categorical and Quantitative Data	S-ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.												✓					
Interpreting Categorical and Quantitative Data	S-ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.																	
Interpreting Categorical and Quantitative Data	S-ID.9	Distinguish between correlation and causation.																	

Table 22: Geometry Aligned to Digital PSAT/NMSQT and PSAT 10

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.																✓	✓
Congruence	G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).																	
Congruence	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.																	
Congruence	G-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.																	
Congruence	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.																	
Congruence	G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.																	
Congruence	G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.																✓	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.																✓	
Congruence	G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.																✓	
Congruence	G-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.																✓	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.																	
Congruence	G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.																	
Similarity, Right Triangles, and Trigonometry	G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.															✓	✓	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.																	
Similarity, Right Triangles, and Trigonometry	G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.																	
Similarity, Right Triangles, and Trigonometry	G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.																✓	✓
Similarity, Right Triangles, and Trigonometry	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.																✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.																	✓

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.																	✓
Similarity, Right Triangles, and Trigonometry	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.																	✓
Circles	G-C.1	Prove that all circles are similar.																	
Circles	G-C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.																	
Circles	G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.																	
Circles	G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Expressing Geometric Properties with Equations	G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.																	
Expressing Geometric Properties with Equations	G-GPE.2	Derive the equation of a parabola given a focus and directrix.																	
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																	
Expressing Geometric Properties with Equations	G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).			✓														
Expressing Geometric Properties with Equations	G-GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Expressing Geometric Properties with Equations	G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.															✓		
Geometric Measurement and Dimension	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.																	
Geometric Measurement and Dimension	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.															✓		
Geometric Measurement and Dimension	G-GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.																	
Modeling with Geometry	G-MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).															✓		
Modeling with Geometry	G-MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).									✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Modeling with Geometry	G-MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).																	
Conditional Probability and the Rules of Probability	S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).													✓				
Conditional Probability and the Rules of Probability	S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.																	
Conditional Probability and the Rules of Probability	S-CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.													✓				
Conditional Probability and the Rules of Probability	S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.																	
Conditional Probability and the Rules of Probability	S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.													✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.													✓				

Table 23: Algebra II Aligned to Digital PSAT/NMSQT and PSAT 10

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Complex Number System	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.																	
Complex Number System	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.																	
Complex Number System	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.																	
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓										
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓									
Seeing Structure in Expressions	A-SSE.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓											
Arithmetic with Polynomials and Rational Expressions	A-APR.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.																	
Arithmetic with Polynomials and Rational Expressions	A-APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.								✓									
Arithmetic with Polynomials and Rational Expressions	A-APR.4	Prove polynomial identities and use them to describe numerical relationships.																	
Arithmetic with Polynomials and Rational Expressions	A-APR.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.						✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓									
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓									
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓									
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓										
Reasoning with Equations and Inequalities	A-REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.							✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																	
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓									
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓															

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓					
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓									
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓									
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓									

Connecticut Core Standards			Algebra: Linear equations in one variable	Algebra: Linear functions	Algebra: Linear equations in two variables	Algebra: Systems of two linear equations in two variables	Algebra: Linear equations in one or two variables	Advanced Math: Equivalent expressions	Advanced Math: Nonlinear equations in one variable / Systems of equations in two variables	Advanced Math: Nonlinear functions	Problem Solving and Data Analysis: Ratios, rates, proportional relationships, and units	Problem Solving and Data Analysis: Percentages	Problem Solving and Data Analysis: One variable data: Distributions and measures of center and spread	Problem Solving and Data Analysis: Two-variable data: Models and scatterplots	Problem Solving and Data Analysis: Probability and conditional probability	Problem Solving and Data Analysis: Inference from sample statistics	Geometry and Trigonometry: Area and volume	Geometry and Trigonometry: Lines, angles, and triangles	Geometry and Trigonometry: Right triangles
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																	
Linear, Quadratic, and Exponential Models	F-LE.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.																	
Trigonometric Functions	F-TF.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.																	
Trigonometric Functions	F-TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Trigonometric Functions	F-TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.																	
Trigonometric Functions	F-TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.																	
Interpreting Categorical and Quantitative Data	S-ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.														✓			
Making Inferences and Justifying Conclusions	S-IC.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.														✓			
Making Inferences and Justifying Conclusions	S-IC.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Making Inferences and Justifying Conclusions	S-IC.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.																	
Making Inferences and Justifying Conclusions	S-IC.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.																	
Making Inferences and Justifying Conclusions	S-IC.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.																	
Making Inferences and Justifying Conclusions	S-IC.6	Evaluate reports based on data.																	

Table 24: Mathematics I Aligned to Digital PSAT/NMSQT and PSAT 10

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Quantities	N-Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.									✓								
Quantities	N-Q.2	Define appropriate quantities for the purpose of descriptive modeling.																	
Quantities	N-Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.																	
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓									
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓									
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓									
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓										
Reasoning with Equations and Inequalities	A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	✓		✓	✓	✓		✓	✓									
Reasoning with Equations and Inequalities	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	✓				✓				✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.																	
Reasoning with Equations and Inequalities	A-REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				✓													
Reasoning with Equations and Inequalities	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		✓	✓					✓									
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					✓												
Interpreting Functions	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.		✓						✓									
Interpreting Functions	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		✓						✓									
Interpreting Functions	F-IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓									
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓															
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓					

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓									
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓									
Building Functions	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.																	
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Linear, Quadratic, and Exponential Models	F-LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.		✓						✓				✓					
Linear, Quadratic, and Exponential Models	F-LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		✓						✓									
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓				✓					
Linear, Quadratic, and Exponential Models	F-LE.5	Interpret the parameters in a linear or exponential function in terms of a context.		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.																✓	✓
Congruence	G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).																	
Congruence	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.																	
Congruence	G-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.																	
Congruence	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.																	
Congruence	G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.																	
Congruence	G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.																✓	
Congruence	G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.																	
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																	
Expressing Geometric Properties with Equations	G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).			✓														
Expressing Geometric Properties with Equations	G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.															✓		
Interpreting Categorical and Quantitative Data	S-ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).											✓						

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Categorical and Quantitative Data	S-ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.											✓						
Interpreting Categorical and Quantitative Data	S-ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).											✓						
Interpreting Categorical and Quantitative Data	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.													✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Categorical and Quantitative Data	S-ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.												✓					
Interpreting Categorical and Quantitative Data	S-ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.												✓					
Interpreting Categorical and Quantitative Data	S-ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.																	
Interpreting Categorical and Quantitative Data	S-ID.9	Distinguish between correlation and causation.																	

Table 25: Mathematics II Aligned to Digital PSAT/NMSQT and PSAT 10

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
The Real Number System	N-RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.																	
The Real Number System	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.						✓											
The Real Number System	N-RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.																	
Complex Number System	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.																	
Complex Number System	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Complex Number System	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.																	
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓										
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓									
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Seeing Structure in Expressions	A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.						✓		✓									
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓											
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓			✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓									
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓										
Reasoning with Equations and Inequalities	A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.							✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.							✓										
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓									
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓															
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓					

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓									
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓									
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																	
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓				✓					
Trigonometric Functions	F-TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.																✓	
Congruence	G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.																✓	
Congruence	G-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.																✓	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.															✓	✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.																	
Similarity, Right Triangles, and Trigonometry	G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.																	
Similarity, Right Triangles, and Trigonometry	G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.																✓	✓

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.																✓	
Similarity, Right Triangles, and Trigonometry	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.																	✓
Similarity, Right Triangles, and Trigonometry	G-SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.																	✓
Similarity, Right Triangles, and Trigonometry	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.																	✓
Circles	G-C.1	Prove that all circles are similar.																	
Circles	G-C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.																	
Circles	G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Circles	G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.																	
Expressing Geometric Properties with Equations	G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.																	
Expressing Geometric Properties with Equations	G-GPE.2	Derive the equation of a parabola given a focus and directrix.																	
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Geometric Measurement and Dimension	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.																	
Geometric Measurement and Dimension	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.															✓		
Conditional Probability and the Rules of Probability	S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").													✓				
Conditional Probability and the Rules of Probability	S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.																	
Conditional Probability and the Rules of Probability	S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.													✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.																	
Conditional Probability and the Rules of Probability	S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.													✓				
Conditional Probability and the Rules of Probability	S-CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.													✓				

Table 26: Algebra I Aligned to Digital PSAT 8/9

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
The Real Number System	N-RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.																
The Real Number System	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.						✓										
The Real Number System	N-RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.																
Quantities	N-Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.									✓							
Quantities	N-Q.2	Define appropriate quantities for the purpose of descriptive modeling.																
Quantities	N-Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓								
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓									
Seeing Structure in Expressions	A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.						✓		✓								
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓											
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓								
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓								
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓									
Reasoning with Equations and Inequalities	A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	✓		✓	✓	✓		✓	✓								
Reasoning with Equations and Inequalities	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	✓				✓				✓							

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.							✓									
Reasoning with Equations and Inequalities	A-REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.																
Reasoning with Equations and Inequalities	A-REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				✓												
Reasoning with Equations and Inequalities	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.							✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		✓	✓					✓								
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																
Reasoning with Equations and Inequalities	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.		✓						✓								
Interpreting Functions	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		✓						✓								
Interpreting Functions	F-IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.																
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓														
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓								
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓								
Building Functions	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓								
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																	

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Linear, Quadratic, and Exponential Models	F-LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.		✓						✓				✓				
Linear, Quadratic, and Exponential Models	F-LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		✓						✓								
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Linear, Quadratic, and Exponential Models	F-LE.5	Interpret the parameters in a linear or exponential function in terms of a context.		✓						✓								
Interpreting Categorical and Quantitative Data	S-ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).											✓					
Interpreting Categorical and Quantitative Data	S-ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.											✓					
Interpreting Categorical and Quantitative Data	S-ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).											✓					
Interpreting Categorical and Quantitative Data	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.													✓			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Categorical and Quantitative Data	S-ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.												✓				
Interpreting Categorical and Quantitative Data	S-ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.												✓				
Interpreting Categorical and Quantitative Data	S-ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.																
Interpreting Categorical and Quantitative Data	S-ID.9	Distinguish between correlation and causation.																

Table 27: Geometry Aligned to Digital PSAT 8/9

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.															✓	✓
Congruence	G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).																
Congruence	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.																
Congruence	G-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.																
Congruence	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.																
Congruence	G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.																
Congruence	G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.																
Congruence	G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.															✓	✓
Congruence	G-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.																
Congruence	G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.																
Similarity, Right Triangles, and Trigonometry	G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.														✓		

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.																
Similarity, Right Triangles, and Trigonometry	G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.																
Similarity, Right Triangles, and Trigonometry	G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.																
Similarity, Right Triangles, and Trigonometry	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.																
Similarity, Right Triangles, and Trigonometry	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.																
Similarity, Right Triangles, and Trigonometry	G-SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.																
Circles	G-C.1	Prove that all circles are similar.																
Circles	G-C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.																
Circles	G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.																
Circles	G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.																
Expressing Geometric Properties with Equations	G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Expressing Geometric Properties with Equations	G-GPE.2	Derive the equation of a parabola given a focus and directrix.																
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																
Expressing Geometric Properties with Equations	G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).			✓													
Expressing Geometric Properties with Equations	G-GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.																
Expressing Geometric Properties with Equations	G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.														✓		

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Geometric Measurement and Dimension	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.																
Geometric Measurement and Dimension	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.														✓		
Geometric Measurement and Dimension	G-GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.																
Modeling with Geometry	G-MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).														✓		
Modeling with Geometry	G-MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).									✓							
Modeling with Geometry	G-MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").													✓			
Conditional Probability and the Rules of Probability	S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.																
Conditional Probability and the Rules of Probability	S-CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.													✓			
Conditional Probability and the Rules of Probability	S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.																
Conditional Probability and the Rules of Probability	S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.													✓			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.													✓			

Table 28: Algebra II Aligned to Digital PSAT 8/9

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Complex Number System	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.																
Complex Number System	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.																
Complex Number System	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.																
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓									
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓								
Seeing Structure in Expressions	A-SSE.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓										
Arithmetic with Polynomials and Rational Expressions	A-APR.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.																
Arithmetic with Polynomials and Rational Expressions	A-APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.								✓								
Arithmetic with Polynomials and Rational Expressions	A-APR.4	Prove polynomial identities and use them to describe numerical relationships.																
Arithmetic with Polynomials and Rational Expressions	A-APR.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.						✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓											
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓								
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓								
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓									
Reasoning with Equations and Inequalities	A-REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓								
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓														

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓				
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓								
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓								
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\, f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓								
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																
Linear, Quadratic, and Exponential Models	F-LE.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Trigonometric Functions	F-TF.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.																
Trigonometric Functions	F-TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.																
Trigonometric Functions	F-TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.																
Trigonometric Functions	F-TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.																
Interpreting Categorical and Quantitative Data	S-ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.																
Making Inferences and Justifying Conclusions	S-IC.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Making Inferences and Justifying Conclusions	S-IC.2	Decide if a specified model is consistent with results from a given data- generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?																
Making Inferences and Justifying Conclusions	S-IC.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.																
Making Inferences and Justifying Conclusions	S-IC.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.																
Making Inferences and Justifying Conclusions	S-IC.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.																
Making Inferences and Justifying Conclusions	S-IC.6	Evaluate reports based on data.																

Table 29: Mathematics I Aligned to Digital PSAT 8/9

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Quantities	N-Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.									✓							
Quantities	N-Q.2	Define appropriate quantities for the purpose of descriptive modeling.																
Quantities	N-Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.																
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓								
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓											
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.			✓		✓			✓								
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓									
Reasoning with Equations and Inequalities	A-REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	✓		✓	✓	✓		✓	✓								
Reasoning with Equations and Inequalities	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	✓				✓				✓							
Reasoning with Equations and Inequalities	A-REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.																
Reasoning with Equations and Inequalities	A-REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				✓												

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).		✓	✓					✓								
Reasoning with Equations and Inequalities	A-REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.																
Reasoning with Equations and Inequalities	A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					✓											

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.		✓						✓								
Interpreting Functions	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.		✓						✓								
Interpreting Functions	F-IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.																
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓														
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓								
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓								
Building Functions	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.																
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Linear, Quadratic, and Exponential Models	F-LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.		✓						✓				✓				
Linear, Quadratic, and Exponential Models	F-LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		✓						✓								
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓								
Linear, Quadratic, and Exponential Models	F-LE.5	Interpret the parameters in a linear or exponential function in terms of a context.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.															✓	
Congruence	G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).																
Congruence	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.																
Congruence	G-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.																
Congruence	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.																
Congruence	G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.																
Congruence	G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.																
Congruence	G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Congruence	G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.																
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																
Expressing Geometric Properties with Equations	G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).			✓													
Expressing Geometric Properties with Equations	G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.														✓		
Interpreting Categorical and Quantitative Data	S-ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).											✓					

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Categorical and Quantitative Data	S-ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.											✓					
Interpreting Categorical and Quantitative Data	S-ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).											✓					
Interpreting Categorical and Quantitative Data	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.													✓			
Interpreting Categorical and Quantitative Data	S-ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.												✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Categorical and Quantitative Data	S-ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.												✓				
Interpreting Categorical and Quantitative Data	S-ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.																
Interpreting Categorical and Quantitative Data	S-ID.9	Distinguish between correlation and causation.																

Table 30: Mathematics II Aligned to Digital PSAT 8/9

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
The Real Number System	N-RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.																
The Real Number System	N-RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.						✓										
The Real Number System	N-RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.																
Complex Number System	N-CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.																
Complex Number System	N-CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.																
Complex Number System	N-CN.7	Solve quadratic equations with real coefficients that have complex solutions.																
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓									

Connecticut Core Standards			Algebra: Linear equations in one variable	Algebra: Linear functions	Algebra: Linear equations in two variables	Algebra: Systems of two linear equations in two variables	Algebra: Linear equations in one or two variables	Advanced Math: Equivalent expressions	Advanced Math: Nonlinear equations in one variable / Systems of equations in two variables	Advanced Math: Nonlinear functions	Problem Solving and Data Analysis: Ratios, rates, proportional relationships, and units	Problem Solving and Data Analysis: Percentages	Problem Solving and Data Analysis: One variable data: Distributions and measures of center and spread	Problem Solving and Data Analysis: Two-variable data: Models and scatterplots	Problem Solving and Data Analysis: Probability and conditional probability	Geometry and Trigonometry: Area and volume	Geometry and Trigonometry: Lines, angles, and triangles	Geometry and Trigonometry: Right triangles
Seeing Structure in Expressions	A-SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	✓	✓	✓	✓	✓			✓								
Seeing Structure in Expressions	A-SSE.2	Use the structure of an expression to identify ways to rewrite it.	✓	✓	✓			✓	✓									
Seeing Structure in Expressions	A-SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.						✓		✓								
Arithmetic with Polynomials and Rational Expressions	A-APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.						✓										

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Creating Equations	A-CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	✓				✓											
Creating Equations	A-CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		✓	✓					✓								
Creating Equations	A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.							✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Reasoning with Equations and Inequalities	A-REI.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.							✓									
Reasoning with Equations and Inequalities	A-REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.							✓									

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.		✓						✓								
Interpreting Functions	F-IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.		✓														
Interpreting Functions	F-IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.			✓									✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Interpreting Functions	F-IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.								✓								
Interpreting Functions	F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓								
Building Functions	F-BF.1	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. c. Compose functions.		✓						✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Building Functions	F-BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		✓						✓								
Building Functions	F-BF.4	Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.																
Linear, Quadratic, and Exponential Models	F-LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.								✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Trigonometric Functions	F-TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.																
Congruence	G-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.																
Congruence	G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.															✓	
Congruence	G-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.														✓		
Similarity, Right Triangles, and Trigonometry	G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.																
Similarity, Right Triangles, and Trigonometry	G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.																
Similarity, Right Triangles, and Trigonometry	G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.																

Connecticut Core Standards			Algebra: Linear equations in one variable	Algebra: Linear functions	Algebra: Linear equations in two variables	Algebra: Systems of two linear equations in two variables	Algebra: Linear equations in one or two variables	Advanced Math: Equivalent expressions	Advanced Math: Nonlinear equations in one variable / Systems of equations in two variables	Advanced Math: Nonlinear functions	Problem Solving and Data Analysis: Ratios, rates, proportional relationships, and units	Problem Solving and Data Analysis: Percentages	Problem Solving and Data Analysis: One variable data: Distributions and measures of center and spread	Problem Solving and Data Analysis: Two-variable data: Models and scatterplots	Problem Solving and Data Analysis: Probability and conditional probability	Geometry and Trigonometry: Area and volume	Geometry and Trigonometry: Lines, angles, and triangles	Geometry and Trigonometry: Right triangles
Similarity, Right Triangles, and Trigonometry	G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.																
Similarity, Right Triangles, and Trigonometry	G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.																
Similarity, Right Triangles, and Trigonometry	G-SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.																
Similarity, Right Triangles, and Trigonometry	G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.																
Circles	G-C.1	Prove that all circles are similar.																
Circles	G-C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.																
Circles	G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Circles	G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.																
Expressing Geometric Properties with Equations	G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.																
Expressing Geometric Properties with Equations	G-GPE.2	Derive the equation of a parabola given a focus and directrix.																
Expressing Geometric Properties with Equations	G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).																
Geometric Measurement and Dimension	G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Geometric Measurement and Dimension	G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.														✓		
Conditional Probability and the Rules of Probability	S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").													✓			
Conditional Probability and the Rules of Probability	S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.																
Conditional Probability and the Rules of Probability	S-CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.													✓			
Conditional Probability and the Rules of Probability	S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.																
Conditional Probability and the Rules of Probability	S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.													✓			

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Conditional Probability and the Rules of Probability	S-CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.													✓			

Table 31: Mathematics Grade 8 Aligned to Digital PSAT 8/9

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
The Number System	8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.																
The Number System	8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).																
Expressions and Equations	8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions.						✓	✓									
Expressions and Equations	8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.							✓	✓								

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Expressions and Equations	8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.																
Expressions and Equations	8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.																
Expressions and Equations	8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.		✓														
Expressions and Equations	8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.		✓	✓													

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Expressions and Equations	8.EE.7	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	✓															

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Expressions and Equations	8.EE.8	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. c. Solve real-world and mathematical problems leading to two linear equations in two variables.				✓												
Functions	8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.		✓						✓								
Functions	8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		✓						✓								
Functions	8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.		✓										✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Functions	8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.		✓										✓				
Functions	8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.		✓						✓				✓				
Geometry	8.G.1	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Geometry	8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.																
Geometry	8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two- dimensional figures using coordinates.																
Geometry	8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.														✓		
Geometry	8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.															✓	
Geometry	8.G.6	Explain a proof of the Pythagorean Theorem and its converse.																

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Geometry	8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.																
Geometry	8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.																
Geometry	8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.														✓		
Statistics and Probability	8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.												✓				
Statistics and Probability	8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.												✓				

Connecticut Core Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Statistics and Probability	8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.												✓				
Statistics and Probability	8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.													✓			