Connecticut Prekindergarten–Grade 8 Mathematics Curriculum Standards

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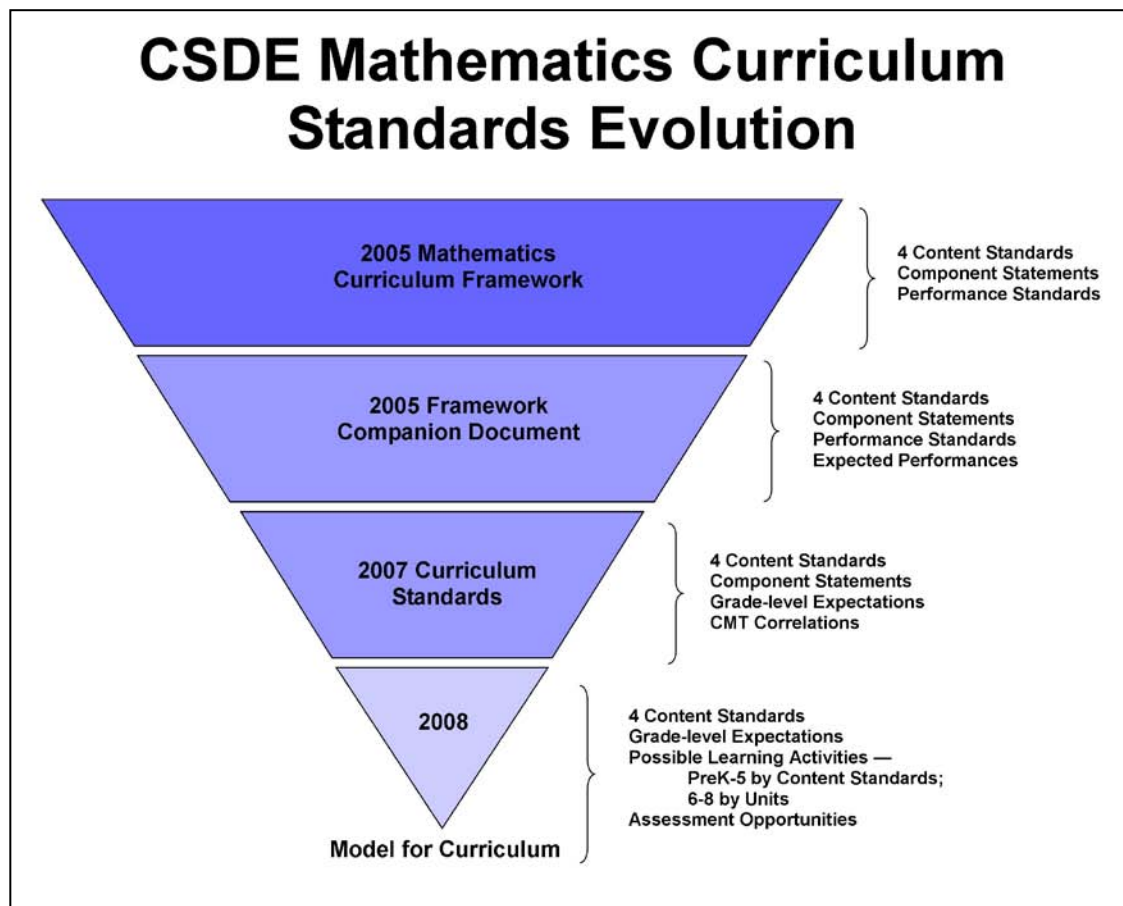
Introduction

The 2007 *Connecticut Prekindergarten-Grade 8 Mathematics Curriculum Standards* is a document based on the 2005 *Connecticut Mathematics Curriculum Framework* and framework companion documents. The curriculum standards document includes grade-level expectations (GLEs), which define the concepts and skills that every student should know and be able to do by the end of the specified grade level and are intended for school districts to use in developing mathematics curriculum. In this document, the grade-level expectations are aligned with the 2006 *Connecticut Preschool Curriculum Framework* (PCF), the 2008 *Connecticut Preschool Assessment Framework* (PAF), and the fourth-generation Connecticut Mastery Test (CMT). Correlations to the preschool curriculum and assessment frameworks are included at the prekindergarten level. CMT correlations are included at the kindergarten through Grade 8 levels.

Foundation

The graphic to the right shows the evolution of the mathematics curriculum standards. The 2005 mathematics curriculum framework standards and component statements have been the basis for each successive iteration to date. The grade-level expectations in the 2007 *Connecticut Prekindergarten-Grade 8 Mathematics Curriculum Standards* further delineate the performance standards and expected performances outlined in the 2005 framework documents. In many cases, the GLE includes the language from the framework. Concepts and skills described in the GLEs reflect a progression from one grade level to the next. The italicized grade-level expectations address content where the progression was not clearly stated or obvious in the 2005 documents.

CSDE Mathematics Curriculum Standards Evolution

- 2005 Mathematics Curriculum Framework — 4 Content Standards, Component Statements, Performance Standards
- 2005 Framework Companion Document — 4 Content Standards, Component Statements, Performance Standards, Expected Performances
- 2007 Curriculum Standards — 4 Content Standards, Component Statements, Grade-level Expectations, CMT Correlations
- 2008 — 4 Content Standards, Grade-level Expectations, Possible Learning Activities — PreK-5 by Content Standards; 6-8 by Units, Assessment Opportunities
- Model for Curriculum

The [2008 Model for Mathematics Curriculum Grades PreK-8](#) provides further clarification of the curriculum standards. The documents include connections between and among GLEs, with suggested activities that promote learning. Other key features of these documents include suggestions for assessment and connections to children's literature.

Structure

The *Connecticut Prekindergarten-Grade 8 Mathematics Curriculum Standards* document is organized by the four standards of the 2005 mathematics curriculum framework. Framework standard statements for Algebraic Reasoning: Patterns and Functions; Numerical and Proportional Reasoning; Geometry and Measurement; and Working with Data: Probability and Statistics are across the top of each applicable page. The corresponding component statements are in the far left column titled "State Framework." For prekindergarten, the PCF correlations are included next, then the grade-level expectations, and finally the PAF correlations. For kindergarten through Grade 8, Connecticut Mastery Test correlations are included.

When using the *Connecticut Prekindergarten-Grade 8 Mathematics Curriculum Standards* document, it is important to note that grade-level expectations are not correlated to or assessed by a single CMT strand. In addition, *concepts and skills that are tested for mastery at a particular grade level are typically found in the grade-level expectations of previous grades.*

Curriculum Alignment

A district developing its PK-8 mathematics curriculum must use the *Connecticut Prekindergarten-Grade 8 Mathematics Curriculum Standards*. As a district prioritizes the grade-level expectations, the National Council of Teachers of Mathematics (NCTM) *[Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics](#)* and the [Connecticut PK-8 Models for Mathematics Curriculum](#) will provide guidance around the critical concepts and skill areas for focus at each grade. In addition, district instructional strategies and resources should reflect the process standards set forth in the NCTM's *[Principles & Standards for School Mathematics](#)*.

For further information and assistance in the development of curriculum, consult the [Connecticut Curriculum Development Guide.](#)

Additional resources to consider include:

- *[Connecticut Preschool Framework](#)*
- *[Connecticut Preschool Assessment Framework](#)*
- *[English Language Learner (ELL) Framework](#)*
- *[Connecticut Mastery Test Fourth Generation Mathematics Handbook](#)*
- *[Connecticut Academic Performance Test Mathematics Handbook](#)*

PREKINDERGARTEN

Algebraic Reasoning: Patterns and Functions

Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Preschool Curriculum Framework	Grade-Level Expectations	Preschool Assessment Framework
1.1 Understand and describe patterns and functional relationships.	Sort objects by one or more attributes and regroup the objects based on a new attribute	1. Sort and classify familiar objects by a single attribute (size, shape, color, texture, orientation and position) and explain the reason.	Cog 3 Sorts objects
	Recognize simple patterns and duplicate or extend them. Create and duplicate patterns and shapes using a variety of materials	2. Recognize, copy, extend and create simple AB patterns using objects, movement or sounds.	Cog 4 Recognizes and makes patterns

PREKINDERGARTEN

Numerical and Proportional Reasoning

Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Preschool Curriculum Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	Preschool Assessment Framework
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	Estimate and verify the number of objects. Show spatial awareness by demonstrating an understanding of position and order. Order several objects on the basis of one attribute.	1. *Represent quantities of up to 20 objects in a set.* 2. Compare two sets of up to 20 objects, and identify which set is more, less or the same. 3. Identify the ordinal position of objects: first and last. 4. Explore a whole and half of an object.	Cog 6 Relates number to quantity Cog 5 Compares and orders objects and events.
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	Demonstrate understanding of one-on-one correspondence while counting	5. *Count by rote to at least 20.* 6. *Count as one more object is added to a set of up to 20 objects.* 7. *Act out and solve story problems using sets of up to 10 objects.*	Cog 6 Related number to quantity

PREKINDERGARTEN

Geometry and Measurement

Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Preschool Curriculum Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	Preschool Assessment Framework
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	Compare and contrast objects and events. Sort objects by one or more attributes and regroup the objects based on a new attribute.	1. Identify and describe familiar shapes (triangles, squares, rectangles and circles) and solids (cubes, spheres, cylinders and prisms) in the environment and contextual situations. 2. Compare and sort familiar shapes and solids in the environment and contextual situations. 3. Construct shapes using a variety of materials.	Cog 3 Sorts objects Cog 5 Compares and orders objects and events.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	Show spatial awareness by demonstrating an understanding of position and order.	4. Describe location, direction, and position of objects using terms such as under, over, inside, next to, near, in front of, first and last. 5. *Complete simple shape and jigsaw puzzles and explain the reasoning used to complete the puzzle.*	Cog 5 Compares and orders objects and events.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	Demonstrate an understanding of sequence of events and time periods.	6. Use patterns to determine events that reoccur. 7. Sequence events and describe time periods using terms such as morning, afternoon, night, yesterday, today and tomorrow .	Cog 5 Compares and orders objects and events.
	Use common instruments to measure things.	8. Use nonstandard units or reference objects to compare length, area and capacity and to order, estimate and sort objects by size (length or area). Describe the comparisons using language such as more, longer, shorter or taller. 9. *Discuss strategies to estimate and compare length, area, temperature and weight.*	Cog 1 Engages in scientific inquiry.

PREKINDERGARTEN

Working with Data: Probability and Statistics

Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Preschool Curriculum Framework	Grade-Level Expectations	Preschool Assessment Framework
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	Collect, organize and display information.	1. Create real graphs using familiar objects and pictures that represent information about the group of children.	Cog 5 Compares and orders objects and events.
4.2 Analyze data sets to form hypotheses and make predictions.	Collect, organize and display information.	2. Describe real graphs using comparative language such as more, less, most, least and the same.	Cog 1 Engages in scientific inquiry.
4.3 Understand and apply basic concepts of probability.	Compare and contrast objects and events. Make and verify prediction about what will occur.	3. Use patterns to describe some events that repeat. 4. Explain why events are likely or unlikely to happen, based on personal experiences.	Cog 1 Engages in scientific inquiry. Cog 5 Compares and orders objects and events.

KINDERGARTEN

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Sort and classify objects by attributes including size, shape, color, texture, orientation, position and use, and explain the reason for each sort.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute.
	2. Describe and make comparisons of qualitative and quantitative changes of a given pattern using terms such as warmer, softer, more, one more, less, one less, bigger, smaller, longer and shorter.	**1A.** Solve problems involving one more/less or 10 more/less using two-digit numbers. **15A.** Estimate lengths and areas by comparing.
	3. Recognize, reproduce, extend and create repeating patterns using movement, sounds, color, shapes, numbers and textures. 4. Identify and extend visual, auditory and physical patterns to make predictions.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute. **25A.** Solve extended numerical and statistical problems.

KINDERGARTEN

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. *Represent quantities of up to 30 objects in a set.* 2. *Compare sets of up to 30 objects and use the terms more, less or the same to compare the two sets and identify a set with one more or one less than a given set.* 3. Order sets of up to 30 objects from least to greatest. 4. Identify the ordinal position of objects: first, second, third, fourth, fifth and last. 5. Use a variety of models and familiar object to compare two parts of a whole and describe the parts as being closer to a whole or closer to very little. 6. Use a variety of models and familiar objects to: • Identify one whole and one half of an object. • Recognize a half and put two halves of an object together to make a whole. • Form a whole from two smaller sets that have equal amounts.	**1A.** Solve problems involving one more/less or 10 more/less using two-digit numbers. **2A.** Relate whole numbers to pictorial representations of base ten blocks and vice versa. **2D.** Identify points representing two- and three-digit whole numbers on a number line and vice versa. **4A.** Order two- and three-digit whole numbers **4B.** Describe magnitude of two- and three-digit whole numbers. **4C.** Round two-digit whole numbers in context. **11A.** Identify a reasonable estimate to a problem. **2B.** Identify fractional parts of regions and sets using pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and sets. **25A.** Solve extended numerical and statistical problems.
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	7. Count by rote to at least 30. 8. Count and group up to 30 objects by tens. 9. Identify the numerals 1-30 and match each numeral to an appropriate set of objects. 10. *Act out and solve addition and subtraction story problems that reflect real-world experiences and contextual problems using sets of up to 10 objects and describe the strategy or reasoning used to solve a problem. For example: Put two crayons together with four crayons; then count to determine the number of crayons needed for all students at a table.*	**6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information.

KINDERGARTEN

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	11. Write the number sentences that correspond to story problems using addition, subtraction and equals symbols (+, -, =) correctly. 12. Estimate the amount of objects in a set using 10 as a benchmark and then count to determine if the amount is more or less than 10. 13. Identify and name pennies and dimes. 14. Count pennies and trade pennies for objects.	**5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **10A.** Identify the best expression to find an estimate. **11A.** Identify a reasonable estimate to a problem. **2A.** Relate fractions and decimals to pictorial representations and vice versa. **2B.** Relate fractions of regions and sets to pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and/or sets. **3A.** Relate equivalent fractions to pictorial representations. **8A.** Add and subtract fractions with like denominators. **25A.** Solve extended numerical and statistical problems.

KINDERGARTEN

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Identify and describe familiar shapes (triangles, squares, rectangles and circles) and solids (cubes, spheres, cylinders, cones and prisms) in the environment. 2. Compare and sort familiar shapes and solids in the environment and contextual situations. 3. Construct small sets of shapes and solids using a variety of materials.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	4. Describe location, direction, and position of objects or parts of objects, using terms such as under/over, inside/outside, next to/near, top/bottom, in front of, first and last. 5. *Complete simple shape and jigsaw puzzles and explain the reasoning used to complete the puzzle and solve the problem.*	**15A.** Estimate lengths and areas by comparing. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	6. Recognize events that reoccur (at specific times of the day or week). 7. Locate yesterday, today, and tomorrow on a calendar to sequence events and use terms such as before and after to compare events.	**14B.** Solve problems involving time, elapsed time (15-minute increments) and calendars.
	8. Use nonstandard units, physical referents (such as a finger) or everyday objects such as links, Unifix cubes or blocks to compare, estimate and order measures of length, area, capacity, weight and temperature and describe the reasoning and strategies used. 9. Describe and order small sets of familiar objects by size, length or area using comparative language such as more, bigger, longer, shorter and taller.	**15A.** Estimate lengths and areas by comparing. **16A.** Measure lengths to the nearest inch or centimeter. **16B.** Draw lengths to the nearest inch or centimeter. **16C.** Identify appropriate customary or metric units of measure for a given situation (inches, feet, centimeters and meters). **25A.** Solve extended numerical and statistical problems.
	10. Use a balance scale to compare the weight of two objects and identify which is heavier.	

KINDERGARTEN

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Pose questions about objects and events in the environment that can be used to guide the collection of data. 2. Collect data, record and the results using real graphs and picture graphs. 3. Arrange information in a systematic way using counting, sorting, lists and graphic organizers.	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **19B.** Create bar graphs and pictographs from data in tables and charts. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	4. Describe data using the terms more, less and the same. 5. Identify and extend patterns from organized data to make predictions. For example: More boys than girls in our class watch television every day. We predict that the same will be true for another kindergarten class.	**22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	6. Describe the likelihood of the future occurrence of events based on patterns and personal experiences using terms such as likely, unlikely or certainly. 7. Engage in simple probability activities and discuss the results.	**21A.** Identify correct solutions to problems involving elementary notions of probability. **25A.** Solve extended numerical and statistical problems.

GRADE 1

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Sort, classify and order numbers and objects by one and two attributes including size, shape, color, texture, orientation, position and use, and explain the reason or rule used. 2. Recognize, extend and create one- attribute and two-attribute patterns, e.g., size and shape, counting, e.g., by 5 or10, and number patterns, e.g., n + 2. Describe the pattern and the rule used to make it. 3. Replicate a pattern using a different representation, e.g., from color to shape. 4. Develop and test generalizations based on observations of patterns and relationships.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute. **6A.** Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10 **25A.** Solve extended numerical and statistical problems. **5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes.

GRADE 1

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.2 Represent and analyze quantitative relationships in a variety of ways.	5. Model real-life situations that represent the result of counting, combining and separation of sets of objects (addition and subtraction of whole numbers) with objects, pictures, symbols and open sentences.	**5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **25A.** Solve extended numerical and statistical problems.
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	6. Demonstrate understanding of equivalence or balance with objects, models, diagrams, operations or numbers, e.g., using a balance scale, or an arm balance showing the same amount on both sides.	**6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **25A.** Solve extended numerical and statistical problems.

GRADE 1

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations *(Italics indicate Grade 4 CMT)*
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Represent and identify whole numbers up to 100 as groups of tens and ones using models and number lines. 2. Compare and order quantities of up to 100 objects, including naming a number that is one or ten more or less than a given number 3. Describe and estimate quantities using benchmark amounts such as zero, 10 and 100 4. Identify ordinal numbers up to 10th with an ordered set of objects, e.g., point to the fifth crayon lined up on the table. 5. Use a variety of models and familiar objects to compare two parts of a whole object and describe the parts as being closer to very little, one half or one whole. 6. Use a variety of models and familiar objects to: • Make a whole of equal size parts of familiar objects. • Show and identify equal size pieces of a whole as halves, thirds or fourths • Identify pieces of a whole as not being halves, thirds or fourths. 7. Determine half of a whole set of up to 20 objects. 8. Describe ratios in terms of the patterns that develop in the relationships between quantities, e.g., if one cat has four legs, then two cats have eight legs.	**1A.** Solve problems involving one more/less or 10 more/less using two-digit numbers. **1B.** Identify alternative forms of expressing 3-digit whole numbers using expanded notation. **1C.** Identify alternative forms of expressing 2-digit whole numbers using regrouping. **1D.** Use place value concepts to identify and compare the magnitude and value of digits in two- and three-digit numbers. **2A.** Relate whole numbers to pictorial representations of base ten blocks and vice versa. **2B.** Identify fractional parts of regions and sets using pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and sets. **2D.** Identify points representing two- and three-digit whole numbers on a number line and vice versa. **4A.** Order two- and three-digit whole numbers. **4B.** Describe magnitude of two- and three-digit whole numbers. **4C.** Round two-digit whole numbers in context. **11A.** Identify a reasonable estimate to a problem. **25A.** Solve extended numerical and statistical problems. **23A.** Solve simple one-step algebraic equations involving addition, subtraction and fact families.

GRADE 1

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations *(Italics indicate Grade 4 CMT)*
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	9. Count by rote to at least 100. 10. Count on from a given amount, orally and with models, and count back from 10. 11. Count and group at least 100 objects by tens. 12. Identify, read and write numerals to 100. 13. Create problems and write one- and two-digit number sentences that reflect contextual situations and real world experiences. Solve the problems using a variety of methods including models, pictures, pencil and paper, estimation and mental computation, and describe the reasoning or strategies used. For example: Tell a story or draw a picture for a problem that can be solved using the number sentence $10 + 6 = 16$. 14. Solve contextual problems using all addition sums to 18 and subtraction differences from 10 with flexibility and fluency. 15. Estimate the amount of objects in a set using zero, 10 and 100 as benchmarks and then determine if the estimate was reasonable. 16. Identify and name pennies, nickels, dimes and quarters. 17. Determine and compare sets of pennies and dimes valued up to $1.00; trade sets of pennies for dimes and vice versa. For example: José has three dimes and eight pennies. Andrea has two dimes and 17 pennies. If they do not have the same amount of money, who has more or less? How much more or less?	**6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **10A.** Identify the best expression to find an estimate. **11A.** Identify a reasonable estimate to a problem. **2A.** Relate fractions and decimals to pictorial representations and vice versa. **2B.** Relate fractions of regions and sets to pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and/or sets. **3A.** Relate equivalent fractions to pictorial representations. **8A.** *Add and subtract fractions with like denominators.* **25A.** Solve extended numerical and statistical problems.

GRADE 1

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Identify and describe familiar two- dimensional shapes and three-dimensional solids in the environment and contextual situations. 2. Copy two- and three-dimensional designs from visual memory. 3. Compare and sort familiar shapes and solids and designs found in the environment and contextual situations 4. Construct shapes and solids using a variety of materials and create two-dimensional shapes and designs with a line of symmetry.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	5. Describe location, direction and position of objects or parts of objects, using terms such as left, right and opposite.	**15A.** Estimate lengths and areas by comparing. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	6. *Know the days of the week in order and locate dates, days, weeks and months on a calendar. Use the information to solve problems involving the planning and sequencing of events.* 7. Solve problems involving telling time to the nearest hour using digital and analog clocks. Estimate and compare the length of time needed to complete a task using comparative language such as longer, shorter, more or less.	**14A.** Tell time to the nearest hour, half-hour and quarter-hour using analog and digital clocks. **14B.** Solve problems involving time, elapsed time (15-minute increments) and calendars. **25A.** Solve extended numerical and statistical problems.
	8. Use nonstandard units or physical referents to estimate answers to measurement problems involving length, area, weight, temperature, volume and capacity, and then justify the reasonableness of the answers. Suggested materials include Unifix or locking cubes, paperclips, Popsicle sticks, square tiles, water and sand. 9. Use nonstandard units, references or direct comparison of objects (appearance), to order objects by length, area and capacity. 10. Explore using standard units of measure (inch and centimeter) to communicate measurement in a universal manner.	**15A.** Estimate lengths and areas by comparing. **16A.** Measure lengths to the nearest inch or centimeter. **16B.** Draw lengths to the nearest inch or centimeter. **16C.** Identify appropriate customary or metric units of measure for a given situation (inches, feet, centimeters and meters). **25A.** Solve extended numerical and statistical problems.

GRADE 1

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Pose questions that can be used to guide data collection, organization and representation. 2. Collect and systematically organize and represent the data that answers the questions using lists, charts and tables, tallies, glyphs (coded pictures), picture graphs and bar graphs.	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **19B.** Create bar graphs and pictographs from data in tables and charts. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Describe data that have been organized and make comparisons using terms such as largest, smallest, most often or least often.	**22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	4. Describe and explain the likelihood of the occurrence of various events in the student's world using terms such as possible, impossible, likely, unlikely or certain. 5. Engage in simple probability activities and games including the use of number cubes and spinners; record, graph and describe the results of the activities and games.	**21A.** Identify correct solutions to problems involving elementary notions of probability. **25A.** Solve extended numerical and statistical problems.

GRADE 2

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Sort, classify and order objects and numbers in more than one way and by one and two attributes and describe the rule used. Use attributes such as size, shape, color, texture, orientation, position and use; and characteristics such as symmetry and congruence. 2. Recognize, extend, and create repeating, growing, number; e.g., skip counting, odd/even, counting on by 10; and one and two attribute patterns. Describe the pattern and the rule used to make it. 3. *Replicate the pattern using a different representation, e.g., letters to numbers.* 4. Use patterns and the rules that describe the patterns to identify a missing object, objects with common or different attributes, and the complement of a set of objects. 5. Analyze and describe observable changes in patterns using language that describes number characteristics and qualitative characteristics such as attributes, orientation and position.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute. **6A.** Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10. **17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute. **25A.** Solve extended numerical and statistical problems. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes.

GRADE 2

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
1.2 Represent and analyze quantitative relationships in a variety of ways.	6. Model real-life situations that represent the addition and subtraction of whole numbers with objects, pictures, symbols and open sentences.	**5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **25A.** Solve extended numerical and statistical problems.
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	7. Demonstrate an understanding of equivalence or balance of sets using objects, models, diagrams, numbers whole number relationships (operations) and the equals sign, e.g., 2 + 3 = 5 is the same as 5 = 2 + 3 and the same as 4 + 1 = 5.	**6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **25A.** Solve extended numerical and statistical problems.

GRADE 2

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations *(Italics indicate Grade 4 CMT)*
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Locate, label, compare, and order whole numbers up to 1,000 using pictures, place value models, number lines, and benchmarks of 0, 10 and 100, including naming the number that is 10 or 100 more or less than a given number. 2. Represent whole numbers up to 1,000 by modeling and writing numbers in expanded forms, e.g., 37 = (3 x 10) + (7 x 1), and regrouped forms, e.g., (2 x 10) + (17 x 1) = 37, and use the forms to support computational strategies. 3. Represent multiplication and division (with factors of 1, 2, 5 and 10) using a variety of models and strategies such as arrays, pictures, skip counting, extending number patterns, and repeated addition and subtraction; describe the connection between multiplication and division. 4. Use a variety of models and familiar objects to compare, order and estimate parts of a whole using the unit fractions ½, , ¼. 5. Use a variety of models to represent and describe parts of groups as unit fractions ½, through ¹⁄₁₀. 6. Estimate and determine ½, , ¼ of a small group of up to 20 objects, such as finding ½, , ¼ of 12 cookies. 7. Describe ratios in terms of the linear patterns that develop from the relationships between quantities, e.g., In a pattern of green, green, red blocks there are always two green blocks for one red block.	**1A.** Solve problems involving one more/less or 10 more/less using two-digit numbers. **1B.** Identify alternative forms of expressing 3-digit whole numbers using expanded notation. **1C.** Identify alternative forms of expressing 2-digit whole numbers using regrouping. **1D.** Use place value concepts to identify and compare the magnitude and value of digits in two- and three-digit numbers. **2A.** Relate whole numbers to pictorial representations of base ten blocks and vice versa. **2B.** Identify fractional parts of regions and sets using pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and sets. **2D.** Identify points representing two- and three-digit whole numbers on a number line and vice versa. **4A.** Order two- and three-digit whole numbers **4B.** Describe magnitude of two- and three-digit whole numbers. **4C.** Round two-digit whole numbers in context. **11A.** Identify a reasonable estimate to a problem. **25A.** Solve extended numerical and statistical problems. **23A.** Solve simple one-step algebraic equations involving addition, subtraction and fact families.

GRADE 2

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations *(Italics indicate Grade 4 CMT)*
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	8. *Count whole numbers to 1,000 and beyond.* 9. *Count on by tens from a given amount, e.g., 17, 27, 37, etc.* 10. *Read and write numerals up to 1,000.* 11. Skip count by twos, fives, tens and hundreds to 1,000 and beyond. 12. Determine whether a set of objects has an odd or even number of items by pairing objects and creating arrays. 13. Create word problems and write and solve two- and three-digit number sentences that reflect contextual situations and real-world experiences involving addition and subtraction. Construct and solve open sentences, e.g., + 5 = 11. Solve the problems using a variety of methods including models, pictures, pencil and paper, estimation and mental computation, and describe the reasoning or strategies used. 14. Solve problems using addition and subtraction facts involving sums and differences to 20 with flexibility and fluency 15. Add two-digit numbers with and without regrouping. Subtract two-digit numbers without regrouping and with regrouping using models. 16. Determine when an estimate for a problem involving two- and three-digit numbers is appropriate or when an exact answer is needed. 17. Use a variety of strategies to estimate solutions and to determine if a solution to a computation or word problem reflecting real-world experiences involving addition and subtraction of two- and three-digit whole numbers is reasonable. 18. *Determine and compare the value of pennies, nickels, dimes, quarters and half dollars.* 19. Count, compare and trade sets of pennies, dimes and dollars up to $10.00	**6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **10A.** Identify the best expression to find an estimate. **11A.** Identify a reasonable estimate to a problem. **2A.** Relate fractions and decimals to pictorial representations and vice versa. **2B.** Relate fractions of regions and sets to pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and/or sets. **3A.** Relate equivalent fractions to pictorial representations. **8A.** *Add and subtract fractions with like denominators.* **25A.** Solve extended numerical and statistical problems.

GRADE 2

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Identify, describe and draw polygons (triangles, quadrilaterals including trapezoids and rhombuses, pentagons and hexagons), solids, and other familiar two- and three- dimensional objects in the environment. 2. Compare and sort familiar polygons, solids, and other two- and three-dimensional objects in the environment. 3. Construct polygons, solids and other two- and three-dimensional objects using a variety of materials and create two-dimensional shapes and designs with one or more lines of reflective symmetry (lines that divide the shape or design into two congruent parts).	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	4. Investigate and predict the result of putting together and taking apart two- and three-dimensional shapes in the environment, e.g. use objects to find other shapes that can be made from three triangles or a rectangle and a triangle.	**15A.** Estimate lengths and areas by comparing. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	5. *Know the months of the year in order and locate dates, days, weeks and months on a calendar. Use the information to write and solve problems involving calendars.* 6. *Solve problems involving telling time, including estimating and measuring the length of time needed to complete a task, to the half-hour using analog and digital clocks.*	**14A.** Tell time to the nearest hour, half-hour and quarter-hour using analog and digital clocks. **14B.** Solve problems involving time, elapsed time (15-minute increments) and calendars. **25A.** Solve extended numerical and statistical problems.

	GRADE 2	
	Geometry and Measurement Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.	
State Framework	**Grade-Level Expectations** *(Italics indicate links not evident in 2005 framework)*	**CMT Correlations**
	7. Use measurement tools such as thermometers to measure temperature, basic rulers to measure length to the nearest half-inch or centimeter, and balance scales to measure weight /mass in grams. 8. Use nonstandard referents and standard benchmarks to estimate and measure the following: • length (to the nearest inch, half-inch, foot, yard, centimeter or meter); • area (in square inches); • capacity (in liters and cups); • weight (in grams); • temperature; and • volume (using water or sand). 9. Describe the strategy used to determine an estimate and determine if the estimate is reasonable. 10. *Describe the relationships between and centimeter and meter among inch, foot and yard.*	**15A.** Estimate lengths and areas by comparing. **16A.** Measure lengths to the nearest inch or centimeter. **16B.** Draw lengths to the nearest inch or centimeter. **16C.** Identify appropriate customary or metric units of measure for a given situation (inches, feet, centimeters and meters). **25A.** Solve extended numerical and statistical problems.

GRADE 2

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Pose questions that can be used to guide data collection, organization and representation. 2. Collect and systematically organize and represent the data that answer the questions using lists, charts and tables, tallies, glyphs (coded pictures), picture graphs and bar graphs.	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **19B.** Create bar graphs and pictographs from data in tables and charts. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Describe data that have been organized and make comparisons using terms such as largest, smallest, most often or least often. 4. Determine patterns and make predictions from data displayed in tables and graphs.	**22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	5. Describe and explain the likelihood of the occurrence of various events. State possibilities, make predictions and test the predictions in practical situations. 6. Conduct simple probability investigations involving activities of chance and games with number cubes and spinners; record, graph and describe the results of the investigations.	**21A.** Identify correct solutions to problems involving elementary notions of probability. **25A.** Solve extended numerical and statistical problems.

GRADE 3

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Sort, classify and order a group of objects and numbers in more than one way and explain the reason or describe the rule used. 2. Create and construct numerical and spatial patterns and sequences that repeat and grow. 3. Analyze, describe and extend repeating and growing patterns and sequences, including those found in real-world contexts, by constructing and using tables, graphs and charts.	**4 A.** Order two- and three-digit whole numbers **17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute. **25A.** Solve extended numerical and statistical problems.
		6A. Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10 **17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **17B.** Draw two-dimensional geometric shapes and figures. **19A.** Identify correct information from tables, bar graphs, pictographs and charts. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.

GRADE 3

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.2 Represent and analyze quantitative relationships in a variety of ways.	4. Describe mathematical relationships and situations involving computation of whole numbers (addition, subtraction, multiplication and division) using words, symbols, open number sentences and equations, e.g., 56 + ☐ = 100 and 3 x 5 = 9 + 6.	**5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **6A.** Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **25A.** Solve extended numerical and statistical problems.

GRADE 3

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	5. .Demonstrate understanding of equivalence as a balanced relationship of quantities by using the equals sign to relate two quantities that are equivalent and the inequality symbols, < and >, to relate two quantities that are not equivalent. (23 x 5 > 23 x 2) 6. Solve problems and demonstrate an understanding of equivalence using the equals sign in number sentences that reflect the commutative and associative properties of addition and multiplication of whole numbers, e.g. 3 x 5 = 5 x 3.	**4A.** Order two- and three-digit whole numbers **4B.** Describe magnitude of two- and three-digit whole numbers. **4D.** Identify points representing two- and three-digit whole numbers on a number line and vice versa. **5A.** Relate multiplication and division facts to rectangular arrays and pictures. **5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **6A.** Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10 **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **10A.** Identify the best expression to find an estimate. **11 A.** Identify a reasonable estimate to a problem. **25A.** Solve extended numerical and statistical problems.

GRADE 3

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Locate, label, compare and order whole numbers up to 10,000 using place value models, number lines and number patterns (including multiples of 100 and 1,000). 2. Identify the number that is 100 and 1,000 more or less than a given number up to 10,000 using place value models, pictures and number lines. 3. Round three- and four-digit numbers to the nearest hundred and thousand using place value models, number lines and number patterns. 4. Represent three- and four-digit numbers up to 10,000 in expanded forms, e.g., $5,472 = (5 \times 1,000) + (4 \times 100) + (7 \times 10) + (2 \times 1)$, and regrouped forms, e.g., $5,472 = (4 \times 1,000) + (14 \times 100) + (6 \times 10) + (12 \times 1)$. Use the forms to support computational strategies. 5. Represent fractions with like and unlike denominators of 2, 3, 4, 5, 6 and 8 using a variety of materials; label the fractional parts using words and fraction symbols. 6. Locate, label and estimate fractions with like and unlike denominators of 2, 3, 4, 5, 6 and 8 by constructing and using models, pictures and number lines. 7. Determine equivalence, compare and order fractions through the construction and use of models, pictures and number lines with like and unlike denominators of 2, 3, 4, 5, 6 and 8, including identifying a whole object or a whole set of objects as a fraction with the same numerator and denominator. 8. .Use models, number patterns and counting and grouping of objects, to find equal parts of a set of objects and identify amounts such as of 12 is 8. 9. Describe quantitative relationships using ratios and identify patterns with equivalent ratios such as 3 out of 6 crayons are red or 4 out of 8 crayons are red and are the same as 1 out of 2 crayons is red.	**1A.** Solve problems involving one more/less or 10 more/less using two-digit numbers. **1B.** Identify alternative forms of expressing 3-digit whole numbers using expanded notation. **1C.** Identify alternative forms of expressing 2-digit whole numbers using regrouping. **1D.** Use place value concepts to identify and compare the magnitude and value of digits in two- and three-digit numbers. **2A.** Relate whole numbers to pictorial representations of base ten blocks and vice versa. **2B.** Identify fractional parts of regions and sets using pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and sets. **4A.** Order two- and three-digit whole numbers **4B.** Describe magnitude of two- and three-digit whole numbers. **4C.** Round two-digit whole numbers in context. **4D.** Identify points representing two- and three-digit whole numbers on a number line and vice versa. **10A.** Identify the best expression to find an estimate. **11A.** Identify a reasonable estimate to a problem. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.

GRADE 3

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	10. Recall the multiplication and division facts for 1, 2, 3, 4, 5 and 10. 11. Write multiplication and division story problems to match a given multiplication or division number sentence and vice versa; solve the problems and justify the solution. 12. .Solve problems involving addition and subtraction of two- and three-digit whole numbers and money amounts up to $100.00 with and without regrouping, using a variety of strategies, including models. 13. Create and solve addition and subtraction word problems by using place value patterns and algebraic properties (commutative and associative for addition). 14. Solve problems involving the multiplication and division of two- and three-digit numbers by one digit (2, 3, 4, 5 or 10) with models, arrays and pictures of sets. 15. Determine when an estimate for a problem involving two- and three-digit numbers is appropriate or when an exact answer is needed. 16. Use a variety of estimation strategies to determine and justify the reasonableness of an answer to a computation or word problem involving addition and subtraction of two- and three-digit whole numbers and money amounts up to $100.00. 17. Determine when a strategy will result in an overestimate or an underestimate in problems involving two- and three-digit numbers. 18. Determine and compare the value of sets of coins and write the values using decimal notation, e.g., two quarters = 50 cents or $0.50 (50 of 100 cents in a dollar) and is less than two quarters, two dimes and a nickel or $0.75. 19. Determine, compare and write the value of money amounts up to $100.00 and identify equivalent ways to represent a given amount of money, including combinations of pennies, nickels, dimes, quarters and half dollars, e.g., $0.25 can be five nickels, two dimes and one nickel or one quarter.	**4C.** Round two-digit whole numbers in context. **6A.** Add and subtract facts to 18. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **10A.** Identify the best expression to find an estimate. **11A.** Identify a reasonable estimate to a problem. **2A.** Relate fractions and decimals to pictorial representations and vice versa. **2B.** Relate fractions of regions and sets to pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and/or sets. **3A.** Relate equivalent fractions to pictorial representations. **25A.** Solve extended numerical and statistical problems. **5A.** Relate multiplication and division facts to rectangular arrays and pictures. **6B.** Multiply and divide by 2, 5 and 10 **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes.

GRADE 3

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Identify, describe, construct and draw two- dimensional shapes such as quadrilaterals (including parallelograms), pentagons and hexagons. 2. Identify, describe, construct and represent three-dimensional figures such as cubes, spheres, cylinders, cones, pyramids, prisms. 3. Compare and classify polygons and solids and determine congruence by using attributes such as the number and length of sides, faces and edges, and the number and kinds of angles (acute, right and obtuse). 4. *Create two-dimensional figures with one or more lines of reflective symmetry.*	**15A.** Estimate lengths and areas by comparing. **17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **17B.** Draw two-dimensional geometric shapes and figures. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	5. Draw and interpret simple maps using shapes or pictures on a coordinate grid. 6. Investigate ways to tile or tessellate a shape or region using a variety of polygons.	
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	7. Use calendar and clocks to plan and sequence events and identify events and times as occurring in the a.m. and p.m. 8. Solve problems involving telling time to the nearest quarter hour, five minutes and minute using analog and digital clocks.	**14A.** Tell time to the nearest hour, half-hour and quarter-hour using analog and digital clocks. **14B.** Solve problems involving time, elapsed time (15-minute increments) and calendars. **25A.** Solve extended numerical and statistical problems.

GRADE 3

Geometry and Measurement Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	9. *Develop an understanding and describe the relationships between appropriate units of measure through concrete experiences (ounces and pounds; gram and kilograms; inches, feet and yards; meters and kilometers; cups, pints and quarts; and milliliters and liters).* 10. Estimate and measure using nonstandard units and appropriate customary and metric tools and units: • length and perimeter to the nearest ¼ inch or ½ centimeter; • area in square inches or square centimeters; • capacity in cups, pints, quarts, milliliters or liters, • weight in ounces, pounds and grams (mass is weighed in grams); • temperature to the nearest degree; and • volume using inch cubes and centimeter cubes. 11. Describe and use estimation strategies that can identify a reasonable answer to a measurement problem when an estimate is appropriate.	**15A.** Estimate lengths and areas by comparing. **16A.** Measure lengths to the nearest inch or centimeter. **16B.** Draw lengths to the nearest inch or centimeter. **16C.** Identify appropriate customary or metric units of measure for a given situation (inches, feet, centimeters and meters). **25A.** Solve extended numerical and statistical problems.

GRADE 3

### Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Pose questions that can be used to guide data collection, organization, and representation. 2. Collect and organize the data that answer the questions using diagrams, charts, tables, lists, pictographs, bar graphs and line plots	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **19B.** Create bar graphs and pictographs from data in tables and charts. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Analyze data that have been collected and organized, to draw and defend conclusions based on the data. 4. Describe an event or element as typical based upon the range, median and mode of a set of data.	**22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	5. Experiment to test predictions and determine probability in practical situations such as investigating the fairness of games using a variety of spinners and dice. 6. Describe the probability of an outcome as ___ out of ___, e.g., 3 out of 5. 7. Investigate combinations using models.	**21A.** Identify correct solutions to problems involving elementary notions of probability. **25A.** Solve extended numerical and statistical problems.

GRADE 4

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations)	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Extend and compare numerical and geometric sequences and classify patterns as growing or repeating, e.g. 2, 4, 8, _, _, grows and the following sequence repeats: ▽ ⬠ ▱ 2. Develop and test generalizations based on observable patterns and relationships and describe the rules for number patterns using equations, e.g., in this sequence 1, 6, 16, 36 …, to get the next number the current number can be doubled and four added to the product.	**17A.** Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Identify objects that are the same or different by one attribute. **24B.** Sort objects into two groups by a common attribute. **25A.** Solve extended numerical and statistical problems.
1.2 Represent and analyze quantitative relationships in a variety of ways.	3. Describe mathematical relationships and situations, involving ratios and computation of whole numbers, in all four operations with using symbols, number sentences and equations. If ▱ = Then ▱ ▱ ▱ = _____	**5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **6A.** Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10. **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **25A.** Solve extended numerical and statistical problems.

GRADE 4

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations)	CMT Correlations
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	4. Represent possible values by using symbols, e.g., variables, to represent quantities in expressions and number sentences. Use number sentences (equations) to model and solve word problems. 5. Solve problems and demonstrate an understanding of equivalence in mathematical situations that reflect the commutative and associative properties of addition and multiplication of whole numbers and the distributive property.	**5A.** Relate multiplication and division facts to rectangular arrays and pictures. **5B.** Identify the appropriate operation or number sentence to solve a story problem. **5C.** Write story problems from addition or subtraction number sentences. **6A.** Add and subtract facts to 18. **6B.** Multiply and divide by 2, 5 and 10 **7A.** Add and subtract one- and two-digit whole numbers without regrouping. **7B.** Add one- and two-digit whole numbers with regrouping. **9A.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping). **9B.** Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information. **10A.** Identify the best expression to find an estimate. **11 A.** Identify a reasonable estimate to a problem. **25A.** Solve extended numerical and statistical problems.

GRADE 4

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. *Locate, label, compare and order numbers up to 100,000 using place value models, number lines and number patterns (including multiples of 1,000 and 10,000).* 2. Extend number patterns to determine 1,000 and 10,000 more and less than a given number in practical situations. 3. Round whole numbers up to 100,000 using number patterns, number lines, diagrams and place value models. 4. Write and describe equivalent representations of four- and five-digit whole numbers up to 100,000 and beyond, in expanded and regrouped forms. Use the forms to support computational strategies. 5. Relate multiplication and division to number patterns and models of groups and rectangular arrays. 6. Identify and define prime and composite numbers through the use of models including rectangular arrays, place value models and pictures. 7. Locate, label and estimate (round) fractions with like and unlike denominators of 2, 3, 4, 5, 6, 8 and 10 by constructing and using models, pictures and number lines. 8. Construct and use models, pictures and number lines, including rulers to compare and order fractional parts of a whole and mixed numbers with like and unlike denominators of 2, 3, 4, 5, 6 and 8 and 10. 9. Construct and use models, pictures and number lines, including rulers, to identify wholes and parts of a whole (including a part of a group or groups) as simple fractions and mixed numbers. 10. Use models to represent tenths and hundredths and record the representations using equivalent ratio, fraction and decimal notation ($\frac{1}{10}$, 0.1)	**1A.** Solve problems involving 10 more/less or 100 more/less than a given number. **1B.** Identify alternative forms of expressing whole numbers less than 1,000 using expanded notation. **1C.** Identify alternative forms of expressing whole numbers less than 1,000 using regrouping. **1D.** Use place value concepts to identify and compare the magnitude and value of digits in two- and three-digit numbers. **2A.** Relate fractions and decimals to pictorial representations and vice versa. **2B.** Relate fractions of regions and sets to pictures and vice versa. **2C.** Label and/or shade fractional parts of regions and/or sets. **3A.** Relate equivalent fractions to pictorial representations. **4A.** Order whole numbers less than 10,000. **4B.** Describe magnitude of two- and three-digit whole numbers, fractions, mixed numbers and decimals (tenths). **4C.** Round two- and three-digit whole numbers in context. **4D.** Identify points representing two- and three-digit whole numbers, fractions (halves, thirds, fourths) and decimals (tenths) on a number line and vice versa. **10A.** Identify the best expression to find an estimate. **11A.** Identify a reasonable estimate to a problem. **22A.** Identify the missing terms in a pattern, or identify rules for a given pattern using whole numbers and attributes.

GRADE 4

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	11. Express a ratio or division problem as a fraction and describe the relationship between the divisor and the remainder written as a fraction. For example: When determining the number of groups of 3 in 14, we say 14 ÷ 3 = 4 with a remainder of 2 or 4). 12. Solve practical problems involving simple ratios and proportions, e.g., determining distance on maps, by using models, pictures and number patterns 13. Construct and use number lines, pictures and models, including rulers, to determine and identify equivalent ratios and fractions.	**22B.** Extend or complete patterns and state rules for given patterns using whole numbers and attributes. **25A.** Solve extended numerical and statistical problems.
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	*14. Develop and use a variety of computation strategies including place value concepts, number lines and the commutative and associative properties to add and subtract three- and four-digit numbers and money amounts up to $1,000.00.* 15. Solve contextual problems involving addition and subtraction of whole numbers using a variety of methods, including writing appropriate number sentences (equations) and explaining the strategies used. 16. Create story problems to match a given number sentence (equation). 17. Recall the multiplication and division facts 1 through 10. *18. Write multiplication and division story problems involving basic facts and two- and three-digit by one-digit numbers to match a given number sentence and vice versa; solve the problems using strategies that include models and arrays and justify the solutions.* *19. Determine and explain in writing when an estimate is appropriate and whether a particular estimation strategy is reasonable or will result in an overestimate or underestimate involving computation with three- and four-digit numbers and money amounts up to $1,000.* 20. Use models and pictures to add and subtract fractions with like and unlike denominators of 2, 3, 4, 5, 6, 8 and 10 and match number sentences or equations to the problems.	**4C.** Round two- and three-digit whole numbers in context. **5A.** Identify members of multiplication and division fact families from arrays (factors of 2, 3, 4, 5 and 10). **5B.** Identify the appropriate operation or number sentence to solve a story problem (two-digit numbers). **5C.** Write a story problem that matches a given addition, subtraction or multiplication sentence. Use one- and two-digit numbers for addition and subtraction. Use one-digit factors for multiplication. **6A.** Find the missing product in a multiplication equation where one factor is 2, 3, 4, 5 or 10. **6B.** Find the missing factor in a division equation where one factor is 2, 3, 4, 5 or 10. **7A.** Add and subtract two- and three-digit whole numbers and money amounts less than $10 with and without regrouping. **7B.** Multiply and divide two-digit whole numbers by one digit. **8A.** Add and subtract fractions with like denominators.

GRADE 4

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	21. Identify or write number sentences to solve simple problems involving fractions with like denominators, decimals (tenths) and mixed numbers. 22. Write contextual problems involving the addition and subtraction of fractions with like denominators, decimals (tenths) and mixed numbers; solve the problems and justify the solutions. 23. Estimate a reasonable answer to simple problems involving fractions, mixed numbers and decimals (tenths). 24. Write and solve multistep contextual problems, including problems with extraneous information and explain orally and in writing how the answers were determined.	**9A**. Solve one-step story problems involving whole numbers and money amounts. Use two- and three-digit numbers in addition and subtraction problems. Use one- and two-digit numbers in multiplication problems. **9B.** Solve one-step story problems involving addition or subtraction with extraneous information. Use two-and three-digit numbers in addition and subtraction problems. **10A.** Identify the best expression to find an estimate. **11A**. Identify a reasonable estimate to a problem, including estimating change from $1, $5 and $10. **19A**. Identify correct information from tables, bar graphs, pictographs and charts. **23A**. Solve simple one-step algebraic equations involving addition, subtraction and fact families. **25A**. Solve extended numerical and statistical problems.

GRADE 4

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Describe and represent polygons, solids, and other familiar two- and three-dimensional objects. 2. Compare and classify polygons based on relationships such as parallel or perpendicular lines, symmetry and congruence. 3. Make and test conjectures about polygons using geometric relationships such as symmetry and congruence.	**15A.** Estimate lengths and areas by comparing. **17A.** Identify two-dimensional geometric shapes, including number of angles and sides of polygons. **17B.** Identify, describe and draw two-dimensional geometric shapes and figures. **24A.** Solve logic, counting and classification problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	4. Draw and interpret simple maps with ordered pairs of numbers and/or letters in quadrant one of an x, y coordinate system and find possible paths between two points. 5. Analyze geometric reflections (flips), rotations (turns), and translations (slides) of plane figures and describe the relationship to the original figure.	
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	6. Use calendars and clocks to solve problems and schedule events involving elapsed time. 7. *Write and solve problems involving the conversion of simple measures of time, e.g., minutes to hours, hours to days and days to weeks and months.*	**14A.** Solve problems involving time, elapsed time (minutes and hours) and calendars. **14B.** Solve problems involving conversions of measures of time. **25A.** Solve extended numerical and statistical problems.
	8. Use customary and metric tools and units and non-standard units to estimate, measure and solve problems involving length and perimeter to the nearest quarter-inch or half-centimeter, area, capacity, weight, temperature and volume. 9. Use estimation strategies to predict reasonable answers to measurement problems and explain the reasoning used orally and in writing.	**15A.** Estimate lengths and areas by comparing. **16A.** Measure lengths to the nearest inch, half-inch or centimeter. **16B.** Draw lengths to the nearest inch, half-inch or centimeter. **16 C.** Identify appropriate customary or metric units of measure for a given situation. **25A.** Solve extended numerical and statistical problems.

GRADE 4

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Pose questions and develop a plan to collect data using observations, surveys and experiments to answer the questions. 2. Collect, organize and represent the data that answer the questions using simple circle graphs and broken line graphs.	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **19B.** Create bar graphs and pictographs from data in tables and charts. **24A.** Solve logic, counting and classification problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Discuss, make predictions and write about patterns and trends in categorical and numerical data that have been represented in a variety of ways. 4. Determine the range, median, mode and mean of a set of data and describe characteristics of the data set as typical or average based on those determinations.	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **24A.** Solve logic, counting and classification problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	5. Conduct probability experiments and express the probability based on possible outcomes, e.g., 8 out of 10 tiles chosen were red. 6. Determine and describe possible combinations, where order does not matter, e.g., when there is a choice of vanilla (V), chocolate (C) or strawberry (S) ice cream for a two-scoop cone and two different scoops are desired, the possible combinations are CV, CS, or VS.	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **21A.** Identify correct solutions to problems involving elementary notions of probability. **24A.** Solve logic, counting and classification problems involving the organization of data. **25A.** Solve extended numerical and statistical problems.

GRADE 5

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Represent, extend and compare geometric and numeric patterns using words, tables, graphs and equations 2. Analyze patterns and data to make generalizations, make predictions and to identify trends.	**17A.** Identify, describe and/or classify two-dimensional geometric shapes and figures. **19A.** Identify correct information from tables, bar graphs, pictographs and charts. **20 A.** Draw reasonable conclusions from data in tables, bar graphs, pictographs, circle graphs and charts. **22A.** Identify the missing terms in a pattern, or identify rules for a given pattern using whole numbers and attributes. **22B.** Extend or complete patterns and state rules for given patterns using whole numbers and attributes. **24A.** Solve logic, counting and classification problems involving the organization of data. **25A.** Solve extended numerical and statistical problems.
1.2 Represent and analyze quantitative relationships in a variety of ways.	3. Represent and describe mathematical relationships using variables or symbols in expressions, equations and inequalities 4. Describe how a change in one variable relates to a change in a second variable in context. For example: If a recipe requires two cups of flour for eight servings, the flour must be doubled for 16 servings or increased by one-half for 12 servings.	**5 A.** Identify the appropriate operation or number sentence to solve a story problem. **5B.** Write story problems from multiplication or division number sentences, using one- and two-digit numbers. **9A.** Solve one-step story problems involving whole numbers and money amounts with or without extraneous information. Use all operations. **9B.** Solve two-step story problems involving whole numbers and money amounts with or without extraneous information. **10A.** Identify the best expression to find an estimate. **22A.** Extend or complete patterns, or identify rules using numbers and attributes. **22B.** Extend or complete patterns and state rules using numbers and attributes. **23 A.** Solve simple one-step algebraic equations involving addition, subtraction, multiplication and fact families. **25A.** Solve extended numerical and statistical problems.

GRADE 5

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	5. Replace variables or symbols in algebraic expressions with given values and evaluate or simplify the expression, e.g., If =5, find the value of 4 x +7. 6. Model, write and solve one-step equations by using appropriate concrete materials that model equivalence, e.g., If 4 x $\triangle$ = 36, then $\triangle$ equals 9.	**5 A.** Identify the appropriate operation or number sentence to solve a story problem. **5B.** Write story problems from multiplication or division number sentences, using one- and two-digit numbers. **9A.** Solve one-step story problems involving whole numbers and money amounts with or without extraneous information. Use all operations. **9B.** Solve two-step story problems involving whole numbers and money amounts with or without extraneous information. **10A.** Identify the best expression to find an estimate. **11 A.** Identify a reasonable estimate to a problem, including estimating change. **23 A.** Solve simple one-step algebraic equations involving addition, subtraction, multiplication and fact families. **25A.** Solve extended numerical and statistical problems.

GRADE 5

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Compare, order and round whole numbers to 1,000,000 using number patterns, number lines and diagrams. 2. Represent whole numbers up to 1,000,000 in expanded and regrouped forms and use the forms to support computation. 3. Construct and use models, number patterns and pictorial representations to extend place value concepts and patterns to decimals, e.g., 0.1 is one-tenth of one and 0.01 is one one-hundredth of one and one-tenth of 0.1. 4. Investigate negative integers (values less than zero) using place value models, diagrams and number lines and represent negative integers in practical applications, e.g. temperatures, money and locations below sea level. 5. Classify numbers as prime, composite or perfect squares and identify factor pairs using rectangular arrays. 6. Represent equivalent fractions, decimals, ratios and percents using models, pictures, number patterns and common factors. 7. Choose and use benchmarks to approximate locations, of fractions, mixed numbers and decimals, on number lines and coordinate grids. 8. Write division problems in fraction form and round the fraction form to estimate an answer to a division problem, e.g., $^{14}\!/_3 = 4$ 5. 9. Use models and pictures to identify and compare ratios and represent ratios in equivalent fraction and decimal forms.	**1A**. Solve problems involving 100 more/less or 1,000 more/less than a given number. **1B**. Identify alternative forms of expressing whole numbers less than 10,000 using expanded notation. **1C**. Identify alternative forms of expressing whole numbers less than 10,000 using regrouping. **1D**. Use place value concepts to identify and compare the magnitude and value of digits in numbers. **2A**. Relate decimals (0.01-2.99) to pictorial representations and vice versa. **2B**. Relate fractions and mixed numbers to pictures and vice versa. **2C**. Identify and/or shade fractional parts of regions, sets or mixed numbers in pictures. **3A**. Rename equivalent fractions. **3B**. Rename equivalent mixed numbers as improper fractions and vice versa. **4A**. Order whole numbers less than 100,000. **4B**. Order mixed numbers, fractions and decimals. **4C**. Describe magnitude of whole numbers less than 100,000 and decimals. **4D**. Describe magnitude of mixed numbers and fractions.

GRADE 5

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
		4E. Round whole numbers in context. **4F**. Round decimals. **4G**. Locate points (fractions, decimals and whole numbers) on number lines and scales **10A**. Identify the best expression to find an estimate. **11A**. Identify a reasonable estimate to a problem, including estimating change. **22A**. Identify the missing terms in a pattern, or identify rules for a given pattern using whole numbers and attributes. **22B**. Extend or complete patterns and state rules for given patterns using whole numbers and attributes. **25A.** Solve extended numerical and statistical problems.
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	10. *Solve practical problems involving 10, 100, 1,000 and 10,000 more or less than a number.* 11. Estimate products and missing factors using multiples of 10, 100 and 1,000. 12. Develop and use strategies involving place value relationships, inverse operations and algebraic properties (commutative, associative and distributive) to simplify addition, subtraction and multiplication problems with three-, four- and five-digit numbers and money amounts and division by one-digit factors. 13. *Multiply and divide decimals and money amounts by whole numbers.* 14. Write and solve multistep problems for all four operations involving multidigit whole numbers and money amounts and explain how answers were determined, orally and in writing.	**5A**. Identify the appropriate operation or number sentence to solve a story problem. **5B**. Write story problems from multiplication or division number sentences, using one- and two-digit numbers. **6A**. Multiply and divide facts. **7A**. Add and subtract two-, three- and four-digit whole numbers and money amounts less than $100. **7B**. Multiply and divide multiples of 10 and 100 by 10 and 100. **7C**. Multiply and divide two- and three-digit whole numbers and money amounts less than $10 by one-digit numbers. **8A**. Add and subtract fractions and mixed numbers with like denominators.

GRADE 5

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	15. Find fractional parts of a set by using estimation, counting, grouping of objects, number patterns, equivalent ratios and division. 16. Add and subtract fractions, decimals and mixed numbers using a variety of strategies, e.g., models, mental math, equivalence and substitution: ½ + ¾ can also be solved using 0.5 + 0.75. 17. Construct and use models and pictorial representations to multiply common fractions and mixed numbers by whole numbers. 18. Use ratios and proportions to solve practical problems, e.g., interpreting scale drawings and maps and determining the probability of an event. 19. Use estimation to predict results and to recognize when an answer is or is not reasonable, or will result in an overestimate or underestimate and explain the reasoning used orally and in writing.	**9A**. Solve one-step story problems involving whole numbers and money amounts with or without extraneous information. Use all operations. **9B**. Solve two-step story problems involving whole numbers and money amounts with or without extraneous information. **10A.** Identify the best expression to find an estimate. **10B**. Identify whether and why a particular strategy will result in an overestimate or an underestimate. **11A**. Identify a reasonable estimate to a problem, including estimating change. **19A**. Identify correct information from tables, bar graphs, pictographs and charts. **23A**. Solve simple one-step algebraic equations involving addition, subtraction, multiplication and fact families. **25A**. Solve extended numerical and statistical problems.

GRADE 5

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Represent the surface of three-dimensional solids using two-dimensional nets. 2. Develop formulas for finding the perimeter and area of squares, rectangles and triangles and use them to solve problems. 3. Use the attributes of parallel sides, perpendicular sides, congruent sides/angles, number and length of sides or faces and number and kinds of angles (right, acute or obtuse) to describe, classify and sort polygons and solids (cube, prism, pyramid and sphere). 4. Make and test conjectures about polygons using geometric relationships	**15A.** Estimate lengths and areas. **16B.** Measure and determine perimeters and areas. **17A.** Identify, describe and/or classify two-dimensional geometric shapes and figures. **17B.** Draw, describe and/or classify two-dimensional geometric shapes and figures. **18A.** Identify lines of symmetry. **18B.** Draw lines of symmetry. **18C.** Identify congruent figures. **18D.** Locate points on grids **24A.** Solve logic, counting and classification problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	5. Use an x, y coordinate system to plot points, to estimate the distance between points and to determine the horizontal or vertical distance between two points. 6. Analyze and describe the effect that changing the dimensions (perimeter) of a polygon has on its area and vice versa.	**18D.** Locate points on grids
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	7. Use calendars and clocks to plan and sequence events and to solve problems involving the conversion of measures of time and elapsed time using days, hours, minutes and seconds.	**14A.** Solve problems involving elapsed time (a.m. and p.m.). **14B.** Solve problems involving conversions of measures of time (minutes, hours and days). **25A.** Solve extended numerical and statistical problems.

GRADE 5

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	8. Estimate and measure to solve a variety of problems that involve angles, length, area, weight, mass, temperature, capacity and volume in either metric or customary units explain the reasoning used orally and in writing. 9. *Use cubic inch or cubic centimeter models to find the volume of rectangular solids.* 10. *Solve length problems involving conversions of measure within the customary (inches, feet, yards and miles) or metric systems (millimeters, centimeters, meters and kilometers).*	**15A**. Estimate lengths and areas. **16A**. Measure lengths to the nearest quarter-inch or half-centimeter. **16C**. Identify appropriate customary or metric units of measure (length, capacity and mass) for a given situation. **16D**. Solve problems involving conversions of measures of length. **25A.** Solve extended numerical and statistical problems.

GRADE 5

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Represent sets of data using line plots, bar graphs, double bar graphs, pictographs, simple circle graphs, stem and leaf plots and *scatter plots*. 2. *Compare different representations of the same data set and evaluate how well each kind of display represents the features of the data.*	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **19B.** Create bar graphs and pictographs from data in tables and charts. **20A.** Draw reasonable conclusions from data in tables, bar graphs, pictographs, circle graphs and charts. **20B.** State a conclusion and explain why a claim is or is not reasonable, based on the data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Design and conduct surveys of a representative sample of a population and use the data collected to begin to make inferences about the general population. 4. *Determine the mean, mode and median of a data set and explain in writing, how they are affected by a change in the data set.*	**19A.** Identify correct information from tables, bar graphs, pictographs and charts. **20A.** Draw reasonable conclusions from data in tables, bar graphs, pictographs, circle graphs and charts. **20B.** State a conclusion and explain why a claim is or is not reasonable, based on the data. **24A.** Solve logic, counting and classification problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	5. Design and conduct probability experiments and simple games of chance to test predictions about outcomes and fairness. 6. Determine and describe possible outcomes and express the likelihood of events as a fraction. 7. Determine and describe possible outcomes using permutations, where order does matter, e.g., when there is a choice of vanilla (V), chocolate (C) or strawberry (S) ice cream for a three-scoop cone, there are two possible ways to have the chocolate scoop on top CVS or CSV.	**21A.** Identify correct solutions to problems involving elementary notions of probability. **21 B.** Solve problems involving elementary notions of probability and fairness, including justifying solutions **24A.** Solve logic, counting and classification problems involving the organization of data. **25A.** Solve extended numerical and statistical problems.

GRADE 6

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Analyze, describe in writing and extend a variety of patterns to justify predictions and identify trends.	**22A.** Identify the missing terms in a pattern, or identify rules for a given pattern using numbers and attributes. **22B.** Extend or complete patterns and state rules for given patterns using numbers and attributes. **25A.** Solve extended numerical, statistical and spatial problems.
1.2 Represent and analyze quantitative relationships in a variety of ways.	2. Create tables of values and scatterplots from mathematical relationships and equations and vice versa to solve problems. 3. Examine tables, graphs and equations to determine patterns of change in linear relationships. 4. Write expressions, formulas, equations or inequalities using symbols or variables to denote a pattern or represent a contextual situation.	**25A.** Solve extended numerical, statistical and spatial problems.
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	5. Evaluate algebraic expressions and formulas using substitution.	**23B**. Evaluate equations, identify fact-family relationships and use formulas provided.
	6. Write, model and solve one-step equations using mental math, tables, substitution and concrete models that demonstrate equivalence and justify the solution.	**23A.** Solve simple one-step algebraic equations.

GRADE 6

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Locate and label whole numbers, fractions, decimals and positive and negative integers on number lines, scales, coordinate grids (all four quadrants) and measurement tools.	**4F.** Identify points on number lines and scales, including fractions, decimals and integers. **4G.** Locate points on number lines and scales, including fractions, decimals and integers. **18E.** Locate and draw points on grids.
	2. Compare and order whole numbers, fractions, decimals and positive and negative integers in context using number lines and scales.	**4A.** Order whole numbers up to six digits and decimals (tenths and hundredths). **4B.** Order mixed numbers, fractions and decimals. **4C.** Describe magnitude of whole numbers up to six digits and decimals (tenths and hundredths). **4D.** Describe magnitude of fractions and mixed numbers.
	3. Represent and compare whole numbers (to a billion) and decimals (to thousandths) in expanded notation, e.g., $75.654 = (7 \times 10) + (5 \times 1) + (6 \times 0.1) + (5 \times 0.01) + (4 \times 0.001)$.	**1A.** Solve problems involving 100, 1,000 or 10,000 more/less and 0.1 more/less than a given number. **1B.** Identify alternative forms of expressing whole numbers less than 10,000 using expanded notation and regrouping. (Decimals expressed in expanded notation is tested in Grade 7.) **1C.** Use place value concepts to identify and compare the magnitude and value of digits in numbers.
	4. *Represent chain multiplication, including powers of 10 in exponential and standard form, e.g., $5 \times 5 \times 5 = 5^3 = 125$.* 5. *Factor composite numbers and express them as a product of primes using exponents.*	

GRADE 6

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	6. Determine equivalent fraction, decimal, and percentage representations and choose among these forms to solve problems.	**2A.** Relate fractions, mixed numbers, decimals and percents to their pictorial representations and vice versa. **2B.** Identify and/or shade fractional parts of regions or sets, decimals (tenths and hundredths) and mixed numbers in pictures. **3A.** Rename equivalent fractions and mixed numbers. **3B.** Rename improper fractions and mixed numbers as equivalent decimals and vice versa. (Equivalent percentages are tested in Grade 7.)
	7. *Use ratios and rates (involving different units) to compare quantities.*	**12A.** Solve problems involving simple ratios. **25A.** Solve extended numerical, statistical and spatial problems.
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	8. Understand place value and patterns in place value when multiplying and dividing decimals by powers of 10. 9. Develop, describe and use strategies for solving, simplifying and estimating multiplication and division problems involving large numbers, decimals and powers of 10, e.g., $4.25 \times 100 = 425$ and $365,000 \div 6,000 = 365 \div 6$; $365 \div 6$ $360 \div 6$ 60.	**7B.** Multiply and divide whole numbers and decimals by 10, 100 and 1,000. **7C.** Multiply and divide two- and three-digit whole numbers and money amounts by one-digit numbers and one-digit decimals. **7D.** Identify the correct placement of the decimal point in multiplication and division of decimals by one-digit numbers.
	10. Estimate and find percentages of a number in context using benchmarks and number patterns and ratios to 100. 11. Solve practical problems involving rates, ratios, percentages and proportionality.	

GRADE 6

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	12. Add, subtract, multiply and divide by fractions and decimals in context. 13. Describe situations in writing that connect multiplying fractions to determining the fractional part of a set. 14. Examine the relationships between multiplication by a unit fraction and dividing by the fraction's denominator, e.g., ½ of $6 is the same as $6 ÷ 2, and use this to solve problems. 15. Use the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions. 16. Understand and defend in writing the magnitude of the result of multiplication or division problems involving fractions or decimals.	**8A.** Add and subtract fractions and mixed numbers with reasonable and appropriate denominators. **8B.** Multiply whole numbers and fractions by fractions and mixed numbers.
	17. Determine when an estimate is sufficient or when an exact answer is needed. 18. Estimate solutions to problems and justify the reasonableness of estimates in writing.	**4E.** Round whole numbers up to 6 digits, fractions and decimals in context. **10A.** Identify the best expression to find an estimate. **10B.** Identify whether and why a particular strategy will result in an overestimate or an underestimate. **11A.** Identify a reasonable estimate to a problem, including estimating change. **11B.** Determine a reasonable estimate, and describe the strategy used to arrive at the estimate. **11C.** Given an estimate as a solution, judge its reasonableness and justify the decision.

GRADE 6

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	19. Write and solve multistep problems in context involving addition, subtraction, multiplication and division with whole numbers, fractions, decimals, money and simple percentages.	**5A.** Identify the appropriate operation or number sentence to solve a story problem. **5B.** Write story problems from equations involving fractions and decimals, including money amounts, using all operations. **9A.** Solve one-step story problems involving whole numbers, decimals and money amounts with or without extraneous information. **9B.** Solve two-step story problems involving whole numbers, decimals, fractions and money amounts without extraneous information. **9C.** Solve two-step problems involving whole numbers and decimals with extraneous information. **9D.** Solve two-step problems involving whole numbers, decimals or money amounts, and explain how the answer was determined. **7A.** Add and subtract two-, three- and four-digit whole numbers, money amounts and decimals.
	20. Understand and use divisibility rules, factors of composite numbers and powers of 10 to find products and quotients.	**6A.** Multiply and divide facts.
	21. Apply the order of operations and algebraic properties; i.e., commutative, associative, distributive, inverse operations, and the additive and multiplicative identities; to compute and solve multistep problems and explain solutions in writing. 22. *Use concrete models to develop strategies to add and subtract integers.*	**25A.** Solve extended numerical, statistical and spatial problems.

GRADE 6

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Classify sets and subsets of polygons using the relationship of the sides (length, parallel and perpendicular) and angles (types and measure).	**17A.** Identify and classify two- and three-dimensional geometric shapes and figures. **17B.** Draw, describe and classify 2-dimensional geometric shapes and figures.
	2. Make and test conjectures about polygons and congruence using side and angle relationships and describe the results in writing.	**18C.** Identify congruent and similar figures.
	3. Identify lines of symmetry and reflections, rotations and translations of geometric figures.	**18A.** Identify lines of symmetry. **18B.** Draw lines of symmetry. **18D.** Identify geometric reflections, rotations and translations.
	4. Use rectangles as basic shapes to model and develop formulas for finding the area of triangles, parallelograms and trapezoids. 5. Recognize the relationships among radius, diameter, circumference and area of circles and develop formulas for finding circumference and area based on these relationships.	**25A.** Solve extended numerical, statistical and spatial problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	6. Use and describe concrete strategies for finding the volume of rectangular solids and cylinders.	**16A.** Measure and determine perimeter, area and volume. Explain or show how the solution was determined.
	7. Use measurements to examine the ratios between corresponding side lengths of scale models and similar figures.	**18C.** Identify congruent and similar figures. **25A.** Solve extended numerical, statistical and spatial problems.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	8. Select and use appropriate strategies, tools and units to estimate and solve measurement problems involving length, perimeter, area, volume, capacity, mass and weight.	**15A.** Estimate lengths, areas and angle measures. **16A.** Measure and determine perimeter, area and volume. Explain or show how the solution was determined. **16B.** Identify appropriate customary or metric units of measure (length, temperature, capacity, mass) for a given situation.

GRADE 6

Geometry and Measurement Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	9. Use ratios to convert between customary units of length, mass, capacity and time. 10. Use ratios and powers of 10 to convert between metric units.	**16C.** Identify the correct solution to problems involving the conversions of measures of length, mass, capacity and time. **16D.** Solve problems involving conversions of measures of length, mass, capacity and time. **25A.** Solve extended numerical, statistical and spatial problems.

GRADE 6

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Compare sets of data between two populations, e.g., heights of two classes of students, or within a population, e.g., height vs. arm length of sixth-grade students, using a variety of graphical representations.	**20A.** Draw reasonable conclusions from data in tables, pictographs, line graphs, circle graphs, stem-and-leaf plots and charts. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams and transitive reasoning questions.
	2. Select, create and use appropriate graphical representations of data including, circle graphs, scatter plots, histograms, and stem and leaf plots.	**19A.** Identify correct information from tables, line graphs, bar graphs, stem-and-leaf plots and charts. **19B.** Create bar graphs and line graphs from data in tables and charts. **25A.** Solve extended numerical, statistical and spatial problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Describe the shape of numerical data sets using measures of spread (range) and central tendency (mean, median, mode) and outliers. 4. Determine how the mean, median, mode and range change as a result of changes in the data set and describe in writing.	**20B.** Solve problems involving means, medians and modes of sets of data. **25A.** Solve extended numerical, statistical and spatial problems.
4.3 Understand and apply basic concepts of probability.	5. Investigate and describe the relationship between the number of trials in an experiment and the predicted outcomes. 6. Design and conduct probability experiments to test predictions about outcomes and fairness. 7. Express probabilities as fractions, ratios, decimals and percentages.	**21A.** Identify correct solutions to problems involving elementary notions of probability and fairness. **21B.** Solve problems involving elementary notions of probability and fairness, including justifying solutions.
	8. Find all possible outcomes by systematic listing and counting strategies to solve problems.	**24A.** Solve logic, counting and classification problems involving the organization of data. **25A.** Solve extended numerical, statistical and spatial problems.

GRADE 7

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Analyze a variety of patterns (physical phenomena, numeric and geometric patterns, arithmetic sequences) and generalize with algebraic expressions, formulas or equations.	**22A.** Identify the missing terms in a pattern, or identify rules for a given pattern using numbers and attributes. **22B.** Extend or complete patterns and state rules for given patterns using numbers and attributes. **23D.** Represent situations with algebraic expressions.
	2. Identify and describe in writing the independent and dependent variables in a mathematical situation, e.g., age vs. height of children. 3. Determine when mathematical situations are continuous (distance traveled over time) or discrete sets of points, e.g., weekly sales.	
1.2 Represent and analyze quantitative relationships in a variety of ways.	4. Write expressions, formulas, equations or inequalities using variables to represent mathematical relationships and solve problems. 5. Represent and compare the characteristics of linear and nonlinear relationships using verbal descriptions, e.g., linear –"increases \$1 per month" vs. nonlinear – "doubles every month," tables, graphs, equations or inequalities (when possible).	**23D.** Represent situations with algebraic expressions. **23E.** Write an expression to represent a situation. **25A.** Solve extended numerical and statistical problems
	6. Examine situations with constant or varying rates of change and know that a constant rate of change describes a linear relationship.	
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	7. Evaluate and simplify algebraic expressions, equations and formulas using algebraic properties (i.e., commutative, associative, distributive, inverse operations, and the additive and multiplicative identities) and the order of operations.	**25A.** Solve extended numerical and statistical problems. **23C.** Evaluate expressions or solve equations and use formulas.
	8. Solve real world problems using a variety of algebraic methods including tables, graphs, equations and inequalities.	
	9. Write, model and solve one- and two-step, e.g., $2x + 3 = 11$, equations using a variety of methods such as tables, concrete models and the Properties of Equality and justify the solution.	**23A.** Solve simple one- or two-step algebraic equations. **25A.** Solve extended numerical and statistical problems.

GRADE 7

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Compare and order rational numbers, e.g., -2, , -3.15, 0.8, in context and locate them on number lines, scales and coordinate grids.	**4F.** Locate points on number lines and scales, including fractions, mixed numbers, decimals and integers. **18E.** Locate and draw points on grids. **4A.** Order whole numbers and decimals. **4B.** Order fractions and decimals including mixed numbers in context. **4C.** Describe magnitude of whole numbers and decimals in and out of context. **4D.** Describe magnitude or order of fractions and mixed numbers in context.
	2. Represent rational numbers in equivalent fraction, decimal and percentage forms. 3. Represent fractions as terminating, e.g., ½ = 0.5, or repeating, e.g., = 0.333… decimals and determine when it is appropriate to round the decimal form in context.	**2A.** Relate fractions, mixed numbers, decimals and percents to their pictorial representations and vice versa. **2B.** Identify and/or shade fractional parts of regions or sets, decimals and mixed numbers in pictures. **3A.** Rename fractions and mixed numbers as equivalent decimals and vice versa. **3B.** Rename fractions and decimals (up to 1.00) as equivalent percents and vice versa.
	4. Use patterns to compute with and write whole numbers and fractions as powers of whole numbers and vice versa, e.g., $2^2 = 4$, $2^1 = 2$, $2^0 = 1$, $2^{-1} = ½$, $2^{-2} = ¼$. 5. Understand the relationship between squares and square roots.	

GRADE 7

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
	6. Read, write, compare and solve problems with whole numbers in scientific notation and vice versa.	**1C.** Identify alternative forms of expressing numbers using scientific notation. **25A.** Solve extended numerical and statistical problems.
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	7. Estimate solutions to problems in context or computations with rational numbers and justify the reasonableness of the estimate in writing.	**4E.** Round whole numbers, fractions and decimals in context. **10A.** Identify the best expression to find an estimate. **10B.** Identify whether and why a particular strategy will result in an overestimate or an underestimate. **11A.** Identify a reasonable estimate to a problem. **11B.** Determine a reasonable estimate, and describe the strategy used to arrive at the estimate. **11C.** Given an estimate as a solution, judge its reasonableness and justify the decision.
	8. Apply the order of operations and algebraic properties; i.e., commutative, associative, distributive, inverse operations, and the additive and multiplicative identities; to write, simplify, e.g., $4 (3½) = 4 (3) + 4 (½) = 12 + 2 = 14$, and solve problems, including those with parentheses and exponents.	**23B.** Use order of operations. **8B.** Multiply whole numbers and fractions by fractions and mixed numbers.
	9. Apply a variety of strategies to write and solve problems involving addition, subtraction, multiplication and division of positive rational numbers, i.e., whole numbers, fractions and decimals.	**5A.** Identify the appropriate operation or equation to solve a story problem. **5B.** Write a story problem from an equation. **7A.** Add and subtract two-, three- and four-digit whole numbers, money amounts and decimals.

GRADE 7

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
		7B. Multiply and divide two- and three-digit whole numbers, money amounts and decimals by one-digit numbers and decimals (multiply only).
		7C. Multiply and divide whole numbers and decimals by 10, 100 and 1,000.
		8A. Add and subtract fractions and mixed numbers with reasonable and appropriate denominators.
		9A. Solve one-step story problems involving whole numbers, fractions, decimals and money amounts with or without extraneous information.
		9B. Solve multistep problems involving fractions and mixed numbers with or without extraneous information.
		9C. Solve multistep problems involving whole numbers, decimals, money amounts and mixed numbers, including means.
		9D. Solve multistep problems involving whole numbers, decimals or money amounts, and explain how the solution was determined.
	10. Write ratios and proportions to solve problems in context involving rates, scale factors and percentages.	**12A.** Solve problems involving ratios. **12B.** Solve one-step problems involving proportions in context.

GRADE 7

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
	11. Find and/or estimate a percentage of a number, including percentages that are more than 100 percent and less than 1 percent using a variety of strategies, including: • Number patterns – e.g., find 20 percent of 50. Solution: 10 percent of 50 = 5, so 20 percent of 50 = 2 (5) = 10 • Distributive Property – e.g., find 150 percent of 20. Solution: 150 percent of 20 = 100 percent of 20 + 50 percent of 20. 20 + 10 = 30 • Proportions – e.g., 75 percent of 48 Solution: $\frac{75}{100} = \frac{x}{48}$ $x = 36$ • Multiplication of decimal equivalent – e.g., 0.7 percent of 48. Solution: 0.007 (48) = 0.336 • Estimation – e.g., 22 percent of \$49.95. Estimate 22 percent of \$49.95 20 percent of 50. 10 percent of 50 = 5, so 20 percent of 50 = 2 (5) = 10, therefore, 22 percent of \$49.95 \$10 12. Solve percent problems in context including what percentage one number is of another, percentage increase and percentage decrease using a variety of strategies, e.g., proportions or equations.	**13A.** Find percents of whole numbers or the percent a given number is of another number. **13B.** Solve one-step problems involving percents in context.
	13. Compare the magnitude of and compute with whole numbers expressed as positive powers of 10. 14. Develop and describe strategies for estimating and multiplying whole numbers expressed in scientific notation. 15. Estimate and solve problems containing whole numbers expressed in expanded notation, powers of 10 and scientific notation.	**1A.** Solve problems involving 0.1 more/less or 0.01 more/less than a given number. **1B.** Identify alternative forms of expressing whole numbers and decimals using expanded notation.

GRADE 7

Numerical and Proportional Reasoning Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

State Framework	**Grade-Level Expectations**	**CMT Correlations**
	16. Develop and describe in writing strategies for addition, subtraction, multiplication and division and solve problems with positive and negative integers using models, number lines, coordinate grids and computational strategies. 17. Develop an understanding of absolute value using a number line while solving problems involving distance.	**8C.** Add positive and negative integers (range -20 to 20). **25A.** Solve extended numerical and statistical problems.

GRADE 7

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Classify two- and three-dimensional geometric figures based on their properties including relationships of sides and angles and symmetry (line and/or rotational) and apply this information to solve problems.	**17A.** Identify, describe or classify two- and three-dimensional geometric shapes and figures. **17B.** Draw, describe and classify two-dimensional geometric shapes and figures.
	2. Identify polygons that have line and/or rotational symmetry. 3. Draw the result of transformations on polygons on coordinate planes including translations, rotations, reflections and dilations (reductions and enlargements). 4. Describe the effect of transformations; i.e., position and orientation from the original figure, size; on polygons that have line and/or rotational symmetry.	**18A.** Identify lines of symmetry. **18B.** Draw lines of symmetry. **18F.** Identify geometric transformations (reflections, rotations and translations). **18G.** Draw geometric transformations (reflections and rotations).
	5. *Compare and describe in writing the relationships (including congruence, equality, scale) between the angles, sides, perimeter and area of congruent and similar geometric shapes.*	**18C.** Identify congruent and similar figures. **18D.** Identify and explain congruent or similar figures. **25A.** Solve extended numerical and statistical problems.
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	6. Identify and/or draw two-dimensional representations of three dimensional geometric solids using nets, cross-sections, front, side and top views to solve problems. 7. Use two-dimensional representations of rectangular prisms, pyramids and cylinders to determine surface area.	**18H.** Relate two- and three-dimensional representations and visa versa.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	8. Use formulas to solve problems involving perimeters and areas of polygons and circles. 9. Develop and use formulas to determine volumes of geometric solids (rectangular prisms and cylinders).	**15A.** Estimate lengths, areas and angle measures. **16A.** Measure and determine perimeters, areas and volumes. Explain or show how the solution was determined. **16B.** Determine perimeters, areas and volumes. **25A.** Solve extended numerical and statistical problems.

	GRADE 7	
	Geometry and Measurement Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.	
State Framework	**Grade-Level Expectations** *(Italics indicate links not evident in 2005 framework)*	**CMT Correlations**
	10. Use estimation and measurement strategies to solve problems involving area of irregular polygons and volumes of irregular solids and justify solutions in writing.	
	11. Write and solve problems in context involving conversions of customary or metric units and units of time.	**16C.** Identify appropriate customary or metric units of measure for a given situation. **16D.** Solve problems involving conversions of customary or metric units of measure. **16E.** Solve problems involving conversions of time units. **25A.** Solve extended numerical and statistical problems.

GRADE 8

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Formulate questions and design studies; e.g., surveys, experiments, research using published sources and the Internet; to collect and analyze data.	
	2. Organize and display data using appropriate graphical representation such as, tables and charts, line, bar and circle graphs, Venn diagrams, stem and leaf plots, scatter plots, histograms.	**19B.** Create bar graphs, line graphs and stem-and-leaf plots from data in tables and charts. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams, combinations, permutations and transitive reasoning questions. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	3. Make and defend in writing predictions based on patterns and trends from the graphical representations.	**19A.** Identify correct information from tables, graphs and charts. **20A.** Draw reasonable conclusions from data in tables, graphs and charts. **20B.** State a conclusion and explain why an answer is or is
	4. Find, use and interpret measures of central tendency and spread, including mean, median, mode, range and outliers.	**20C.** Solve problems involving means, medians, modes and ranges of sets of data.
	5. Compare two sets of data based on their spread and measures of central tendency.	**25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	6. Identifying all possible outcomes using models, tree diagrams, tables and/or organized lists to determine theoretical probabilities.	**24A.** Solve problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams, combinations, permutations and transitive reasoning questions.

GRADE 8

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
	7. Perform experiments to determine experimental probabilities. 8. Compare and contrast experimental probability results to theoretical probabilities in writing. 9. Solve probability problems in familiar contexts including simple events (flipping a coin) and compound events (flipping a coin and rolling a number cube).	**21A.** Identify correct solutions to problems involving elementary notions of probability and fairness expressed as fractions, decimals or percents. **21B.** Solve problems involving elementary notions of probability and fairness expressed as fractions, decimals or percents and justify solutions. **21C.** Solve problems involving expected outcomes or predictions and justify solutions. **25A.** Solve extended numerical and statistical problems.

GRADE 8

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.1 Understand and describe patterns and functional relationships.	1. Generalize the relationships in patterns in a variety of ways including recursive and explicit descriptions; e.g., the pattern 1, 4, 7, 10… is represented as follows: • recursively as "add 3 to the previous number" • explicitly as $3n + 1$	**22A.** Identify the missing terms in a pattern, or identify rules for a given pattern using numbers and attributes. **22B.** Extend or complete patterns and state rules for given patterns using numbers and attributes.
	2. Determine whether relationships are linear or nonlinear.	
	3. Write and solve problems involving proportional relationships (direct variation) using linear equations ($y = mx$).	**12C.** Solve multistep problems involving ratio or proportion, and explain how the solution was determined.
	4. Examine and make comparisons in writing between linear and non-linear mathematical relationships including $y = mx$, $y = mx^2$ and $y = mx^3$ using a variety of representations.	
1.2 Represent and analyze quantitative relationships in a variety of ways.	5. Represent linear and nonlinear mathematical relationships with verbal descriptions, tables, graphs and equations (when possible).	**23D.** Represent situations with algebraic expressions or equations. **23E.** Write an expression or equation to represent a situation. **25A.** Solve extended numerical and statistical problems.
	6. Determine the constant rate of change in a linear relationship and recognize this as the slope of a line. 7. Compare and contrast the slopes and the graphs of lines that have a positive slope, negative slope, zero slope, undefined slope, slopes greater than one and slopes between zero and one. 8. Compare and contrast the slopes and the graphs of lines to classify lines as parallel, perpendicular or intersecting. 9. Interpret and describe slope and y-intercepts from contextual situations, graphs and linear equations.	

GRADE 8

Algebraic Reasoning: Patterns and Functions
Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.	10. Evaluate and simplify algebraic expressions, equations and formulas including those with powers using algebraic properties and the order of operations.	**23E.** Write an expression or equation to represent a situation. **23C.** Evaluate expressions or solve equations and use formulas.
	11. Examine systems of two linear equations in context that have a common solution, i.e. point of intersection, using tables, graphs and substitution and interpret the solution.	
	12. Write and solve multistep equations using various algebraic methods including the distributive property, e.g., 3 $(x + 2)$ =10), combining like terms, e.g., $3x + 2x = 15$, and properties of equality and justify the solutions.	**23A.** Solve simple equations, including two-step equations. **23B.** Solve multistep problems using algebraic concepts. **25A.** Solve extended numerical and statistical problems.

GRADE 8

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.	1. Compare and order rational and common irrational numbers; e.g., -5, $\frac{1}{16}$, -4½, $\sqrt{2}$, π; and locate them on number lines, scales and coordinate grids.	**4D.** Locate points on number lines and scales, including fractions, mixed numbers, decimals and integers. **18C.** Locate and draw points on four-quadrant coordinate grids. **4A.** Order fractions and decimals including mixed numbers in context. **4B.** Describe magnitude or order of mixed numbers, fractions and decimals in context.
	2. Identify perfect squares and their square roots; e.g., squares 1, 4, 9, 16… to corresponding roots 1, 2, 3, 4 …; and use these relationships to estimate other square roots.	
	3. Read and represent whole numbers and those between zero and one in scientific notation (and vice versa) and compare their magnitudes.	**1A.** Identify alternative forms of expressing numbers using scientific notation.
	4. *Represent fractions, mixed numbers, decimals and percentages in equivalent forms.*	**3A.** Rename fractions and mixed numbers as equivalent decimals and vice versa. **3B.** Rename fractions and decimals as equivalent percents and vice versa. **3C.** Identify and/or shade decimals, fractions or percents of regions or sets. **25A.** Solve extended numerical and statistical problems.

GRADE 8

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.	5. Compute (using addition, subtraction, multiplication and division) and solve problems with positive and negative rational numbers.	**5A.** Identify the appropriate operation or equation to solve a story problem. **5B.** Write a story problem from an equation. **7A.** Add and subtract three-, four- and five-digit whole numbers, money amounts and decimals. **7B.** Multiply two- and three-digit whole numbers, money amounts and decimals by one- or two-digit numbers and decimals. Divide two- and three- digit whole numbers, money amounts and decimals by one-digit whole numbers and decimals. **8A.** Add and subtract fractions and mixed numbers with reasonable and appropriate denominators. **8B.** Multiply whole numbers and fractions by fractions and mixed numbers. **8C.** Add or multiply positive and negative integers. **9A.** Solve multistep problems involving fractions, mixed numbers, decimals and money amounts with or without extraneous information. **9B.** Solve multistep problems involving whole numbers, mixed numbers, money amounts and decimals. **9C.** Solve multistep problems involving whole numbers, fractions, mixed numbers, decimals or money amounts, and explain how the solution was determined.
	6. Calculate the square roots of positive rational numbers using technology. 7. Develop and use strategies for multiplying and dividing with numbers expressed in scientific notation using the commutative and associative properties.	

GRADE 8

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	8. Estimate reasonable answers and solve problems in context involving rational and common irrational numbers, ratios and percentages (including percentage of increase and decrease) and justify solutions in writing.	**4C.** Round mixed numbers, fractions and decimals in context. **11A.** Determine a reasonable estimate, and describe the strategy used to arrive at the estimate. **11B.** Given an estimate as a solution for problems involving whole numbers, mixed numbers, decimals and percents, judge its reasonableness and justify the decision.
	9. *Use proportional reasoning to write and solve problems in context.*	**12A.** Solve problems involving ratios. **12B.** Solve problems involving proportions in context. **12C.** Solve multistep problems involving ratio or proportion, and explain how the solution was determined.
	10. Solve a variety of problems in context involving percents, including the following: • Percentage of a number, e.g., If 65 percent of the 250 applicants will be accepted to the Arts Magnet School, how many students will be accepted? • The percentage one number is of another number, e.g., Find the percent of students who play soccer if 39 students play soccer out of a total of 387 students. • The percentage of a missing amount, e.g., 5 percent of the money from a fundraiser will be donated to a charity. If $25 is donated to the charity, how much money was made from the fundraiser? • Percentage increase/decrease, e.g., The number of music downloads have increased from 1,345 per minute to 1,567 per minute. What is the percentage increase?	**13A.** Find percents of whole numbers or the percent a given number is of another number. **13B.** Solve problems involving percents in context.

GRADE 8

Numerical and Proportional Reasoning
Quantitative relationships can be expressed numerically in multiple ways in order to make connections
and simplify calculations using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations *(Italics indicate links not evident in 2005 framework)*	CMT Correlations
	11. Use the rules for exponents to multiply and divide with powers of 10 and extend to other bases. • $10^2 \times 10^3 = 10^5$ – Add exponents • $2^5 \div 2^7 = 2^{-2}$ – Subtract exponents	**7C.** Multiply and divide whole numbers and decimals by 10, 100, 1,000, 0.1 and 0.01.
	12. Estimate answers to problems in context containing numbers expressed in scientific notation.	**11A.** Determine a reasonable estimate, and describe the strategy used to arrive at the estimate.
	13. Solve problems in context that involve repetitive multiplication; e.g., compound interest, depreciation; using tables, spreadsheets and calculators to develop an understanding of exponential growth and decay.	**6B.** Multiply two- and three-digit whole numbers, money amounts and decimals by one- or two-digit numbers and decimals. Divide two- and three- digit whole numbers, money amounts and decimals by one-digit whole numbers and decimals. **25A.** Solve extended numerical and statistical problems.

GRADE 8

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	1. Determine the effect of scale factors (resulting in similar figures) on the perimeters and areas of two-dimensional shapes and the surface areas and volumes of three-dimensional solids.	**16A.** Measure and determine perimeters, areas and volumes. Explain or show how the solution was determined.
	2. Make and test conjectures about the angle and side relationships to determine that similar figures have congruent angles and corresponding sides proportional and congruent figures have congruent angles and sides.	**17A.** Identify, describe and classify two- and three-dimensional geometric shapes and figures. **17B.** Draw, describe and classify two- and three-dimensional geometric shapes and figures. (Connected only.) **18A.** Identify congruent and similar figures. **18B.** Draw, classify, describe and/ or explain why figures are similar.
	3. Construct and/or examine right triangles and make and test conjectures about the relationships of the angles and sides and develop the Pythagorean theorem. 4. Apply side and angle relationships in geometric figures to solve problems including the Pythagorean theorem and similar figures.	
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	5. Use a coordinate plane to make and test conjectures about changes in the coordinates of the vertices of polygons as a result of a transformation (translation and/or reflection) and describe the results in writing.	**25A.** Solve extended numerical and statistical problems. **17A.** Identify, describe and classify two- and three-dimensional geometric shapes and figures. **17B.** Draw, describe and classify two- and three-dimensional geometric shapes and figures. **18D.** Identify geometric transformations (reflections, rotations and translations). **18E.** Draw geometric transformations (reflections, rotations and translations).

GRADE 8

Geometry and Measurement
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
	6. Develop and use formulas to determine the surface areas of rectangular prisms, cylinders and pyramids. 7. Develop formulas using measurement strategies and concrete models; and use formulas to determine the volumes of pyramids, cones and spheres.	**18F.** Relate two- and three-dimensional representations and vice versa. **16A.** Measure and determine perimeters, areas and volumes. Explain or show how the solution was determined. **25A.** Solve extended numerical and statistical problems.
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	8. Understand and describe in writing that measurement tools, measurements and estimates of measures are not precise and can affect the results of calculations. 9. Use estimation and measurement strategies, including formulas, to solve surface area and volume problems in context.	**15A.** Estimate lengths, areas, volumes and angle measures. **16A.** Measure and determine perimeters, areas and volumes. Explain or show how the solution was determined. **16B.** Determine perimeters, areas and volumes.
	10. Solve customary or metric measurement problems in context using Dimensional Analysis (the Unit Factor Method) and justify the results in writing.	**16C.** Solve problems involving conversions and/or operations within customary or metric units of measure. **25A.** Solve extended numerical and statistical problems.

GRADE 8

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	1. Collect, organize and display data using an appropriate representation (including box-and-whisker plots, stem and leaf plots, scatter plots, histograms) based on the size and type of data set and purpose for its use. 2. Use appropriate representations to compare and analyze large data sets.	**19B.** Create graphs from data in tables and charts. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams, combinations, permutations and transitive reasoning questions.
	3. Identify where measures of central tendency and spread are found in graphical displays including box-and-whisker plots, stem and leaf plots, scatter plots and histograms.	**19A.** Identify correct information from tables, graphs and charts. **25A.** Solve extended numerical and statistical problems.
4.2 Analyze data sets to form hypotheses and make predictions.	4. Use descriptive statistics, including range, mode, median, mean, quartiles and outliers to describe data and support conclusions in writing.	**20C.** Solve problems involving means, medians, modes and ranges of sets of data.
	5. Make predictions from scatter plots by using or estimating a line-of-best-fit. 6. Make observations and inferences and evaluate hypotheses based on collected and/or experimental data. 7. Describe in writing the accuracy of statistical claims, e.g., 4 out of 5 dentists prefer Brand X toothpaste, by recognizing when a sample is biased or when data is misrepresented. 8. Explain the effects of sample size and sampling techniques (convenience sampling, voluntary response sampling, systematic sampling and random sampling) on statistical claims.	**20A.** Draw reasonable conclusions from data in tables, graphs and charts. **20B.** State a conclusion and explain why an answer is or is not reasonable based on the data. **25A.** Solve extended numerical and statistical problems.
4.3 Understand and apply basic concepts of probability.	9. Determine when a situation is a permutation (changing the order results in a different outcome) or a combination (changing the order does not result in a different outcome).	
	10. Use tree diagrams, lists or the Counting Principle to determine all possible outcomes in permutations and combinations.	**24A.** Solve problems involving the organization of data. **24B.** Sort or classify objects, and draw logical conclusions from data including Venn diagrams, combinations, permutations and transitive reasoning questions.

GRADE 8

Working with Data: Probability and Statistics
Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations
	11. Apply permutations and combinations to predict possible outcomes and find probabilities to solve problems in a variety of contexts.	**21A.** Identify correct solutions to problems involving elementary notions of probability and fairness expressed as fractions, decimals or percents. **21B.** Solve problems involving elementary notions of probability and fairness expressed as fractions, decimals or percents and justify solutions. **21C.** Solve problems involving expected outcomes or predictions and justify solutions. **25A.** Solve extended numerical and statistical problems.