

**Common Core State Standards for
Mathematical Practice
Connecticut Standards for English
Language Learners
Correlation**



The National Governors Association Center for Best Practices and the Council of Chief State School Officers strongly believe that all students should be held to the same high expectations outlined in the Common Core State Standards. This includes students who are English language learners (ELLs). However, these students may require additional time, appropriate instructional support, and aligned assessments as they acquire both English language proficiency and content area knowledge.

ELLs are capable of participating in mathematical discussions as they learn English. Mathematics instruction for ELL students should draw on multiple resources and modes available in classrooms—such as objects, drawings, inscriptions, and gestures—as well as home languages and mathematical experiences outside of school. Mathematics instruction for ELLs should address mathematical discourse and academic language. This instruction involves much more than vocabulary lessons. Language is a resource for learning mathematics; it is not only a tool for communicating, but also a tool for thinking and reasoning mathematically. All languages and language varieties (e.g., different dialects, home or everyday ways of talking, vernacular, slang) provide resources for mathematical thinking, reasoning, and communicating. Regular and active participation in the classroom—not only reading and listening but also discussing, explaining, writing, representing, and presenting—is critical to the success of ELLs in mathematics. Research has shown that ELLs can produce explanations, presentations, etc. and participate in classroom discussions *as they are learning English*. ELLs, like English-speaking students, require regular access to teaching practices that are most effective for improving student achievement. Mathematical tasks should be kept at high cognitive demand; teachers and students should attend explicitly to concepts; and students should wrestle with important mathematics. Overall, research suggests that:

- Language switching can be swift, highly automatic, and facilitate rather than inhibit solving word problems in the second language, as long as the student’s language proficiency is sufficient for understanding the text of the word problem;
- Instruction should ensure that students understand the text of word problems before they attempt to solve them;
- Instruction should include a focus on “mathematical discourse” and “academic language” because these are important for ELLs. Although it is critical that students who are learning English have opportunities to communicate mathematically, this is not primarily a matter of learning vocabulary. Students learn to participate in mathematical reasoning, not by learning vocabulary, but by making conjectures, presenting explanations, and/or constructing arguments; and
- While vocabulary instruction is important, it is not sufficient for supporting mathematical communication.

Furthermore, vocabulary drill and practice are not the most effective instructional practices for learning vocabulary. Research has demonstrated that vocabulary learning occurs most successfully through instructional environments that are language-rich, actively involve students in using language, require that students both understand spoken or written words and also express that understanding orally and in writing, and require students to use words in multiple ways over extended periods of time. To develop written and oral communication skills, students need to participate in negotiating meaning for mathematical situations and in mathematical practices that require output from students.

<http://www.corestandards.org/assets/application-for-english-learners.pdf>

It is important to note that the mathematics content expectations outlined in the CCSS are the same for all students, regardless of the level of English proficiency. The strategies used in instruction should be governed by the manner in which that content is made comprehensible and accessible to the students.

Accordingly, the K-12 Common Core State Standards for Mathematical Practice are the sole focus of this document. It is an attempt to demonstrate the relationship between the eight K-12 Common Core State Standards for Mathematical Practice and the 2005 English Language Learner Framework, (coding revised February 2011). Correlations are drawn between Goal 2 of the 2005 English Language Learner Framework and each of the K-12 Common Core State Standards for Mathematical Practice.

This document is intended for use by all teachers of mathematics, bilingual teachers, and teachers of English as a second language. It lists each of the eight Standards for Mathematical Practice, and highlights examples of connections between the student behaviors outlined in that standard and the indicators for Beginning, Intermediate and Advanced English Language Learners specified by Goal 2 of the ELL Framework. Goal 2 is listed below in the left column of the chart. The middle column lists the content standards (2-1, 2-2, and 2-3) and the Student Questions linked to each content standard under Goal 2. The column to the right breaks down each content standard into more discrete language functions. All of the content standards have three language functions (A, B and C) listed below. Within each function there are numerous indicators, and these have been linked to the Standards for Mathematical Practice in this document. Connecticut's ELL Framework can be accessed at <http://www.sde.ct.gov/sde/cwp/view.asp?a=2618&q=320848> by selecting the document 'English Language Learner Framework - Coded (Revised February 2011) [DOC]' from the menu.

ELL Framework Goal 2

ELL Framework Goal	Content Standards and Student Questions	Language Functions
Goal 2: Use English to achieve in all academic settings including language arts, math, science and social studies	2-1: Use English to participate orally in academic settings What can I do to be able to increase and improve my use of English in different classes?	A: Follow oral and written directions B: Negotiate and manage interaction to accomplish tasks C: Follow the conventions of standard English
	2-2: Use English to read and write in academic settings What can I do to increase and improve my use of English when I have to read and write in different classes?	A: Develop reading skills B: Develop writing skills C: Develop research skills
	2-3: Use English to become independent learners in academic settings What can I do to be a better learner and achieve in different classes?	A: Apply cognitive strategies B: Apply reading strategies C: Apply writing strategies

Correlation Examples:

Unless otherwise indicated the ELL Standards referenced apply to all grades, PK-12

The following three pages provide examples of links between the Standards for Mathematical Practice and ELL Framework indicators at the Beginning, Intermediate, and Advanced ELL Framework levels. In order to clearly show the Standard for Mathematical Practice and the linked ELL Framework pieces, the examples only show a link to one level of the ELL Framework. However, in the actual document, the Standards for Mathematical Practice are linked to indicators at the Beginning, Intermediate and Advanced levels in the three-column charts.

Beginning-level link example:

Standard for Mathematical Practice-2

2. Reason abstract and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situation. They bring two complementary abilities to bear on problems involving quantitative relationships; the ability to *decontextualize*-to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents-and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

ELL Framework Goal 2

Beginning: At this level, students have limited or no understanding of English.

2-2: Use English to read and write in academic settings.

A: Develop reading skills in all academic areas including math, science and social studies.

- PK-12 a)** Activate prior knowledge.
- PK-12 c)** Develop vocabulary.
- PK-12 d)** Expand knowledge of content.
- PK-12 e)** Connect prior knowledge to new information.

Intermediate-level link example:

Standard for Mathematical Practice-1

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

ELL Framework Goal 2

Intermediate: At this level, students have a better understanding of the English language and can function in a limited capacity to satisfy immediate needs.

2-3: Use strategies to become independent learners in academic settings.

A: Apply cognitive strategies in all academic areas including math, science and social studies.

PK-12 d) Know when to use native language resources.

PK-12 e) Use self-monitoring and self-correcting strategies.

3-5 f) Construct learning aids (*as it related to pictures, charts*).

Advanced-level link example:

Standard for Mathematical Practice-3

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into accounts the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic ore reasoning from which is flawed, and--if there is a flaw in the argument--explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

ELL Framework Goal 2

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

C: Follow the conventions of standard English.

PK-2 g) Produce increasingly complex language.

PK-2 h) Communicate clearly and precisely.

PK-2 i) Adjust language, as appropriate, to audience, purpose and task.

3-12 h) Produce increasingly complex language.

3-12 i) Communicate clearly and precisely.

3-12 j) Adjust language, as appropriate, to audience, purpose and task.

CCS Standards for Mathematical Practice/ELL Correlation

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education.

Unless otherwise indicated the ELL Standards referenced apply to all grades, PK-12

Standard for Mathematical Practice-1

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Beginning: At this level, students have limited or no understanding of English.

Team Notes: *As it relates to mathematical problem solving routines, steps to problem solving, mathematical processes.*

Approximate modeling of key vocabulary, simplified language, visual modeling, linguistic modeling, symbolic, peer coaching, gesturing/body language.

2-1: Use English to participate orally in academic settings.

A: Follow oral and written directions
PK-12 a) Repeat modeled language

Intermediate: At this level, students understand more complex speech but may require some repetition.

Team Notes: *Approximate modeling of key vocabulary, simplified language, visual modeling, linguistic modeling, symbolic, peer coaching, gesturing/body language.*

2-1: Use English to participate orally in academic settings.

A: Follow oral and written directions
PK-12 d) follow multistep directions
PK-12 e) Ask a teacher to restate or simplify

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

Team Notes: *Appropriate modeling of key vocabulary, simplified language, visual modeling, linguistic modeling, symbolic, peer coaching, gesturing/body language.*

2-1 Use English to participate orally in academic settings.

A: Follow oral and written directions
PK-12 f) Explain directions to others

2-1: Use English to participate orally in academic

<p>PK-12 b) Participate in daily classroom routines</p> <p>PK-12 c) Follow one-or two-step directions</p> <p>2-1: Use English to participate orally in academic settings</p> <p>B: Negotiate and manage interaction to accomplish tasks</p> <p>PK-12 e) Listen to and respect the opinions of others</p> <p>3-12 n) Listen to and incorporate feedback</p> <p>2-1: Use English to participate orally in academic settings</p> <p>C: Follow the conventions of standard English</p> <p>PK-12 a) Repeat words, phrases and simple sentences accurately</p> <p>2-2: Use English to read and write in academic settings</p> <p>A: Develop reading skills in all academic areas including</p> <p>PK-12 a) Activate prior knowledge</p> <p>PK-12 c) Develop vocabulary</p> <p>PK-12 d) Expand knowledge of content</p> <p>PK-12 e) Connect prior knowledge to new information</p> <p>PK-2 f) Demonstrate comprehension of text through gestures and simple responses</p> <p>PK-2 g) Develop fluency</p> <p>PK-12 h) Explore a variety of genre</p> <p>2-2: Use English to read and write in academic settings</p> <p>B: Develop writing skills in all academic areas including math, science and social studies</p> <p>PK-12 e) Produce original sentences</p>	<p>directions</p> <p>2-1: Use English to participate orally in academic settings.</p> <p>B: Negotiate and manage interaction to accomplish tasks.</p> <p>PK-12 e) Listen to and respect the opinions of others.</p> <p>PK-12 n) Listen to and incorporate feedback</p> <p>3-5- p) Persuade others during discussions and presentations</p> <p>2-1: Use English to participate orally in academic settings</p> <p>C: Follow the conventions of standard English</p> <p>PK-12 c) Produce original sentences with increasing accuracy</p> <p>2-2: Use English to read and write in academic settings</p> <p>A: Develop reading skills in all academic areas including math, science and social studies.</p> <p>PK-2 i) Expand academic vocabulary</p> <p>PK-2 j) Identify main idea</p> <p>3-12 j) Expand academic vocabulary</p> <p>3-12 k) Identify main idea and supporting details</p> <p>3-12 m) Retell, explain and expand the text to check comprehension (<i>as it relates to restating a problem for problem solving.</i>)</p> <p>3-12 n) Select and organize relevant information</p> <p>3-12 p) Classify data and information</p> <p>3-12 q) Answer literal and inferential questions about grade-appropriate texts</p> <p>3-12 r) Increase fluency</p> <p>2-2: Use English to read and write in academic</p>	<p>settings</p> <p>B: Negotiate and manage interaction to accomplish tasks</p> <p>PK-12 e) Listen to and respect the opinion of others</p> <p>3-12 n) Listen to and incorporate feedback</p> <p>3-5 p) Persuade others during discussions and presentations</p> <p>2-1: Use English to participate orally in academic settings</p> <p>C: Follow the conventions of standard English</p> <p>PK-2 h) Communicate clearly and precisely</p> <p>PK-2 i) Adjust language, as appropriate, to audience, purpose and task</p> <p>2-2 Use English to read and write in academic settings</p> <p>A: Develop reading skills in all academic areas including math, science and social studies</p> <p>3-5 u) Analyze, synthesized and construct meaning from text</p> <p>6-12 v) Analyze, synthesized and construct meaning from text</p> <p>2-2 Use English to read and write in academic settings</p> <p>B: Develop writing skills in all academic areas including math, science and social studies</p> <p>6-12 l) Develop clear ideas with supporting details and evidence</p> <p>6-12 m) Adjust language, as appropriate, to audience, purpose and task</p> <p>6-8 r) Recognize and use syntax</p> <p>2-3 Use strategies to become independent learners in academic settings</p> <p>A: Apply cognitive strategies in all academic areas</p>
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<p>2-2: Use English to read and write in academic settings C: Develop research skills in all academic areas including math, science and social studies. PK-12 a) Generating questions for gathering data 3-12 b) Observe and record information PK-2 c) Consult print and non-print resources in the native language when needed 3-12 d) Consult print and non-print resources in the native language when needed 3-12 e) Use available technology to gather information</p> <p>2-3: Use strategies to become independent learners in academic settings A: Apply cognitive strategies in all academic areas including math, science and social studies PK-12 a) Follow verbal and non-verbal cues PK-12 c) Recognize the need for and see assistance</p> <p>2-3: Use strategies to become independent learners in academic settings B: Apply reading strategies in all academic areas including math, science and social studies. PK-12 a) Preview illustrations and text PK-12 b) Make connections to prior knowledge PK-12 c) Make inference from visuals PK-12 d) Make, verify and revise predictions PK-12 f) Use context to construct meaning PK-12 h) Use graphic organizers to enhance comprehension</p> <p>2-3: Use strategies to become independent learners in academic settings C: Apply writing strategies in all academic areas</p>	<p>settings B: Develop writing skills in all academic areas including math, science and social studies 3-12 l) Develop clear ideas with supporting details and evidence 3-12 q) Recognize and use syntax</p> <p>2-2: Use English to read and write in academic settings C: Develop research skills in all academic areas including math, science, and social studies PK-2 e) Observe and record information</p> <p>2-3: Use Strategies to become independent learners in academic settings A: Apply cognitive strategies in all academic areas including math, science and social studies PK-12 d) Know when to use native language resources PK-12 e) Use self-monitoring and self-correcting strategies 3-5 f) Construct learning aids (<i>as it related to pictures, charts</i>)</p> <p>2-3: Use Strategies to become independent learners in academic settings B: Apply reading strategies in all academic areas including math, science and social studies PK-12 j) Visualize images suggested by the text PK-12 k) Make inferences from explicit information PK-12 l) Make and verify hypotheses while reading PK-2 m) Identify main idea 3-12 m) Identify main idea and supporting details</p>	<p>including math, science and social studies PK-2 f) Evaluate one’s own success in a completed learning task 3-5 g) Develop independent study skills 6-8 i) Evaluate one’s own success in a completed learning task 9-12 j) Evaluate one’s own success in a completed learning task</p> <p>2-3 Use strategies to become independent learners in academic settings B: Apply reading strategies in all academic areas including math, science and social studies 9-12 t) Monitor comprehension while reading and self-correct 9-12 w) Support interpretation with evidence from text</p> <p>2-3 Use strategies to become independent learners in academic settings C: Apply writing strategies in all academic areas including math, science and social studies 6-8 r) Use the conventions of persuasion 9-12 s) Use the conventions of persuasion</p>
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<p>including math, science and social studies PK-12 a) Construct a chart or other graphic</p>	<p>9-12 s) Take margin notes or highlight during reading (<i>This should be used and encouraged K-8 in order to be successful on the CMT</i>)</p> <p>2-3: Use Strategies to become independent learners in academic settings</p> <p>C: Apply writing strategies in all academic areas including math, science and social studies</p> <p>PK-12 h) Brainstorm ideas before writing</p>	
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Standard for Mathematical Practice 1

STUDENTS' ROLE:

- Seek and explain the meaning of the problem.
- Look for efficient ways to represent and solve it.
- Ask themselves, “Does this make sense?” and “Can I solve the problem in a different way?”
- Identify the connections between two different approaches to a problem.

Make sense of problems and persevere in solving them



When presented with a problem, I can make a plan, carry out my plan, and evaluate its success.

BEFORE...	DURING...	AFTER...
<p>EXPLAIN the problem to myself.</p> <ul style="list-style-type: none">• <i>Have I solved a problem like this before?</i> <p>ORGANIZE information...</p> <ul style="list-style-type: none">• <i>What is the question I need to answer?</i>• <i>What is given?</i>• <i>What is not given?</i>• <i>What are the relationships between known and unknown quantities?</i>• <i>What tools will I use?</i>• <i>What prior knowledge do I have to help me?</i>	<p>PERSEVERE</p> <p>MONITOR my work</p> <p>CHANGE my plan if it isn't working out</p> <p>ASK myself, “Does this make sense?”</p>	<p>CHECK</p> <ul style="list-style-type: none">• <i>Is my answer correct?</i>• <i>How do my representations connect to my algorithms?</i> <p>EVALUATE</p> <ul style="list-style-type: none">• <i>What worked?</i>• <i>What didn't work?</i>• <i>What other strategies were used?</i>• <i>How was my solution similar to or different from my classmates'?</i>

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Jordan School District 2011, Grade 6

Standard for Mathematical Practice-2

2. Reason abstract and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situation. They bring two complementary abilities to bear on problems involving quantitative relationships; the ability to *decontextualize*-to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents-and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Beginning: At this level, students have limited or no understanding of English.

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
PK-12 a) Activate prior knowledge
PK-12 c) Develop vocabulary
PK-12 d) Expand knowledge of content
PK-12e) Connect prior knowledge to new information

2-3: Use strategies to become independent learners in academic settings

- B:** Apply reading strategies in all academic areas including math, science and social studies
PK-12 b) Make connections to prior knowledge
PK-12 c) Make inferences from visuals
PK-12 f) Use context to construct meaning
PK-12 h) Use graphic organizers to enhance comprehension

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
PK-2 i) Expand academic vocabulary
3-12 j) Expand academic vocabulary
3-12 n) Select and organize relevant information
3-12 p) Classify data and information

2-3: Use strategies to become independent learners in academic settings

- A:** Apply cognitive strategies in all academic areas including math, science and social studies
PK-12 e) Use self-monitoring and self-correcting strategies

2-3: Use strategies to become independent learners in academic settings

- B:** Apply reading strategies in all academic areas including math, science and social studies

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
3-5 u) Analyze, synthesize and construct meaning from text
6-12 v) Analyze, synthesize and construct meaning from text

2-3: Use strategies to become independent learners in academic settings

- A:** Apply cognitive strategies in all academic areas including math, science and social studies.
6-8 j) Analyze and evaluate study behaviors and learning Environments
9-12 k) Analyze and evaluate study behaviors and learning environments

2-3: Use strategies to become independent learners in academic settings


	<p>PK-12 j) Visualize images suggested by the text</p> <p>PK-12 k) Make inferences from explicit information</p>	<p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-2 k) Make inferences from implicit information</p> <p>3-8 s) Make inferences from implicit information</p> <p>9-12 t) Make inferences from implicit information</p> <p>3-8 v) Support interpretation with evidence from text</p> <p>9-12 w) Support interpretation with evidence from text</p>
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Standard for Mathematical Practice 2

STUDENTS' ROLE:

- Decontextualize – to manipulate symbolic representations by applying properties of operations.
- Contextualize – to understand the meaning of the number or variable as related to the problem.
- Understand the meaning of the quantities, not just how to compute them.

Reason abstractly and quantitatively



I can use reasoning habits to help me contextualize and decontextualize problems.

CONTEXTUALIZE

I can take numbers and put them in a real-world context.

For example, if given
 $3 \times 2.5 = 7.5$
I can create a context:

I walked 2.5 miles per day for 3 days. I walked a total of 7.5 miles.

DECONTEXTUALIZE

I can take numbers out of context and work mathematically with them.

For example, if given
'I walked 2.5 miles per day for 3 days. How far did I walk?',
I can write and solve
 $3 \times 2.5 = 7.5$

Reasoning Habits include *1) creating an understandable representation of the problem solved, 2) considering the units involved, 3) attending to the meaning of quantities, and 4) using properties to help solve problems.*

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Jordan School District 2011, Grade 6

Standard for Mathematical Practice-3

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from which is flawed, and--if there is a flaw in the argument--explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

Beginning: At this level, students have limited or no understanding of English.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

PK-12 a) Participate in full-class, group and paired activities

PK-12 b) Take turns when speaking

PK-12 c) Join in group response at appropriate times

PK-12 d) Express opinions

PK-12 e) Listen to and respect the opinions of others

PK-12f) Respond to basic feedback appropriately

2-1: Use English to participate orally in academic settings

C: Follow the conventions of standard English

PK-12 a) Repeat words, phrases and simple sentences accurately

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

PK-12 h) Express and defend opinions

PK-12 i) Use personal experience to add to a discussion

PK-12 j) Contribute relevant ideas to a discussion

PK-12 k) Distinguish among cooperative roles

3-12 l) Question the opinions of others and respect their answers

3-12 m) Use formal language to negotiate and reach consensus

3-12 n) Listen to and incorporate feedback

6-12 o) Distinguish fact from opinion during discussion

2-1: Use English to participate orally in academic

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

3-5 p) Persuade other during discussions and presentations

3-5 q) Distinguish fact from opinion during discussion

6-12 r) Elaborate on and extend the ideas of others

6-12 s) Evaluate information for relevancy

9-12 t) Prepare for and participate in a debate

2-1: Use English to participate orally in academic settings

C: Follow the conventions of standard English

PK-2 g) Produce increasingly complex language

PK-2 h) Communicate clearly and precisely

<p>2-2: Use English to read and write in academic settings A: Develop reading skills in all academic areas including math, science and social studies PK-12 a) Active prior knowledge PK-12 c) Develop vocabulary PK-12 d) Expand knowledge of content PK-12 e) Connect prior knowledge to new information PK-12 g) Develop fluency (<i>fluency=able to express readily w/o effort</i>)</p> <p>2-2: Use English to read and write in academic settings B: Develop writing skills in all academic areas including math, science and social studies PK-12 c) Copy simple sentences (<i>teacher creates a word/sentence bank or stems to assist students with identifying their own opinion</i>), PK-12 e) Produce original sentences PK-12 f) Write on a topic</p> <p>2-2 Use English to read and write in academic settings C: Develop research skills in all academic areas including math, science and social studies PK-12 a) Generate questions for gathering data PK-2 b) Use appropriate visual and auditory sources 3-12 c) Use appropriate visual, print and auditory sources</p> <p>2-3: Use strategies to become independent learners in academic settings A: Apply cognitive strategies in all academic areas including math, science and social studies</p>	<p>settings C: Follow the conventions of standard English PK-12 d) Initiate conversations PK-12 e) Engage in extended conversations</p> <p>2-2 Use English to read and write in academic settings A: Develop reading skills in all academic areas including math, science and social studies PK-2 i)Expand academic vocabulary 3-12 j) Expand academic vocabulary 3-12 n) Select and organize relevant information 3-12 p) Classify data and information 3-12 r) Increase fluency</p> <p>2-2 Use English to read and write in academic settings B: Develop writing skills in all academic areas including math, science and social studies PK-12 h) Publish and share final products 3-12 l) Develop clear ideas with supporting details and evidence 9-12 q) Organize ideas for a relevant and logical argument</p> <p>2-2: Use English to read and write in academic settings C: Develop research skills in all academic areas including math, science and social studies 3-12 f) Raise additional questions generated by research 6-12 g) Select and organize information from appropriate sources for a specific purpose</p> <p>2-3: Use strategies to become independent learners in academic settings A: Apply cognitive strategies in all academic</p>	<p>PK-2 i) Adjust language, as appropriate, to audience, purpose and task 3-12 h) Produce increasingly complex language 3-12 i) Communicate clearly and precisely 3-12 j) Adjust language, as appropriate, to audience, purpose and task</p> <p>2-2: Use English to read and write in academic settings A: Develop reading skills in all academic areas including math, science and social studies 3-5 o) Respond to a story orally or in writing 3-5 t) Develop a critical stance 3-5 u) Analyze, synthesize and construct meaning from text 3-5 v) Critique and evaluate text 3-5 x) Interpret and respond to text 6-12 u) Develop a critical stance 6-12 v) Analyze, synthesize and construct meaning from text 6-12 w) Critique and evaluate text 6-12 y) Interpret and respond to text</p> <p>2-2: Use English to read and write in academic settings B: Develop writing skills in all academic areas including math, science and social studies 3-5 p) Write expository essays 6-8 q) Write expository and persuasive essays 9-12 s) Write expository and persuasive essays (<i>essay=open ended responses to problems or solution to problems</i>)</p> <p>2-2: Use English to read and write in academic settings C: Develop research skills in all academic areas</p>
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<p>PK-12 b) Rehearse and visualize information</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-12 b) Make connections to prior knowledge</p> <p>PK-12 c) Make inferences from visuals</p> <p>PK-12 d) Make, verify and revise predictions</p> <p>PK-12 f) Use context to construct meaning</p> <p>PK-12 h) Use graphic organizers to enhance comprehension</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>C: Apply writing strategies in all academic areas including math, science and social studies</p> <p>PK-12 a) Construct a chart or other graphic</p> <p>PK-12 b) Use visuals to prompt writing</p> <p>PK-12 c) Use observations and experiences (especially family and cultural)</p> <p>PK-12 d) Make lists</p>	<p>areas including math, science and social studies</p> <p>PK-12 e) use self-monitoring and self-correcting strategies</p> <p>3-12 f) Construct learning aids</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-12 j) Visualize images suggested by the text</p> <p>PK-12 k) Make inference from explicit information</p> <p>PK-12 l) Make and verify hypotheses while reading</p> <p>PK-2 m) Identify main idea</p> <p>3-12 m) Identify main idea and supporting details</p> <p>9-12 s) Take margin notes or highlight during reading</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>C: Apply writing strategies in all academic areas including math, science and social studies</p> <p>PK-12 f) Restate a prompt to establish focus</p> <p>PK-12 i)Engage in discussion with peers</p> <p>PK-2 l) Publish and share final drafts</p> <p>3-12 n) Publish and share final drafts</p> <p>PK-2 m) Develop idea banks (journals, clippings, pictures, list of books, films)</p> <p>PK-12 o) Develop idea banks (journals, clippings, pictures, list of books, films)</p> <p>3-8 p) Use elaboration and specific details</p> <p>9-12 q) Use elaboration and specific details</p>	<p>including math, science and social studies</p> <p>PK-2 f) Present results of a research project</p> <p>3-5 g) Present results of a research project</p> <p>6-12 h) Present results of a research project</p> <p>6-12 j) Take notes from a text or presentation</p> <p>6-12 l) Draw conclusion from selected sources</p> <p>6-12 m) Document and justify ideas using evidence from text</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>A: Apply cognitive strategies in all academic areas including math, science and social studies</p> <p>6-8 j) Analyze and evaluate study behaviors and learning environments</p> <p>9-12 k) Analyze and evaluate study behaviors and leaning environments</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-2 p) Monitor comprehension while reading and self-correct</p> <p>3-8 t) Monitor comprehension while reading and self-correct</p> <p>9-12 u) Monitor comprehension while reading and self-Correct</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>3-8 v) Support interpretation with evidence from text</p> <p>9-12 w) Support interpretation with evidence</p>
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		<p>from text</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>C: Apply writing strategies in all academic areas including math, science and social studies</p> <p>K-2 o) Use sequencing</p> <p>3-8 q) Use sequencing</p> <p>9-12 r) Use sequencing</p> <p>6-8 r) Use the conventions of persuasion</p> <p>9-12 s) Use the conventions of persuasion</p>
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Standard for Mathematical Practice 3

STUDENTS' ROLE:

- Construct arguments using verbal or written explanations (expressions, equations, graphs, etc.)
- Evaluate their own thinking and the thinking of others by asking questions like, “How did you get that?” “Why is that true?” “Does that always work?”

Construct viable arguments and critique the reasoning of others



I can make conjectures and critique the mathematical thinking of others.

I can construct, justify, and communicate arguments by...

- ◆ considering context
- ◆ using examples and non-examples
- ◆ using objects, drawings, diagrams and actions

I can critique the reasoning of others by...

- ◆ listening
- ◆ comparing arguments
- ◆ identifying flawed logic
- ◆ asking questions to *clarify or improve arguments*

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Jordan School District 2011, Grade 6

Standard for Mathematical Practice-4

4. Model with mathematics

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Beginning: At this level, students have limited or no understanding of English.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
- PK-12 a)** Participate in full-class, group and paired activities
- PK-12 d)** Express opinions

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
- PK-12 c)** Develop vocabulary
- PK-12 d)** Expand knowledge of content
- PK-12 e)** Connect prior knowledge to new information

2-2: Use English to read and write in academic settings

- B:** Develop writing skills in all academic areas including math, science and social studies

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
- PK-12 h)** Express and defend opinions
- PK-12 i)** Use personal experiences to add to a discussion
- 3-12 l)** Question the opinions of others and respect their answers
- 3-12 m)** Use formal language to negotiate and reach consensus

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
- PK-2 i)** Expand academic vocabulary
- 3-12 j)** Expand academic vocabulary
- 3-12 n)** Select and organize relevant information

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
- 6-12 r)** Elaborate on and extend the ideas of others
- 6-12 s)** Evaluate information for relevancy

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
- 3-5 u)** Analyze, synthesize and construct meaning from text
- 6-12 v)** Analyze, synthesize and construct meaning from text

2-2: Use English to read and write in academic settings

- C:** Develop research skills in all academic areas

<p>PK-12 d) Engage in effective pre-writing activities (brainstorming, discussing, graphic organizers, etc.)</p> <p>2-2: Use English to read and write in academic settings</p> <p>C: Develop research skills in all academic areas including math, science and social studies (<i>at the PK-2 level observe and record mathematics as a matter of course. At the PK-2 level students are observing and recording numerical data as a matter of course</i>)</p> <p>PK-12 a) Generate questions for gathering data</p> <p>3-12 b) Observe and record information</p> <p>PK-2 d) Use available technology to gather information</p> <p>3-12 e) Use available technology to gather information</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-12 c) Make inferences from visuals</p> <p>PK-12 d) Make, verify and revise predictions</p> <p>PK-12 f) Use context to construct meaning</p> <p>PK-12 h) Use graphic organizers to enhance comprehension</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>C: Apply writing strategies in all academic areas including math, science and social studies</p> <p>PK-12 a) Construct a chart or other graphic</p> <p>PK-12 c) Use observations and experience (especially family and cultural)</p> <p>PK-12 d) Make lists</p>	<p>3-12 p) Classify data and information</p> <p>2-2: Use English to read and write in academic settings</p> <p>B: Develop writing skills in all academic area including math, science and social studies</p> <p>PK-2 i) Revise, expand and edit a draft with teacher assistance</p> <p>3-12 l) Develop clear ideas with supporting details and evidence</p> <p>3-12 n) Revise, expand and edit a draft with peer input</p> <p>2-2: Use English to read and write in academic settings</p> <p>C: Develop research skills in all academic areas including math, science and social studies</p> <p>PK-2 e) Observe and record information</p> <p>3-12 g) Present results of a research project</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>A: Apply cognitive strategies in all academic areas including math, science and social studies</p> <p>PK-12 e) Use self-monitoring and self-correcting strategies</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-12 j) Visualize images suggested by the text</p> <p>PK-12 k) Make inferences from explicit information</p> <p>2-3: Use strategies to become independent learners in academic settings</p>	<p>including math, science and social studies</p> <p>6-12 i) Observe and record numerical data</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>A: Apply cognitive strategies in all academic areas including math, science and social studies</p> <p>PK-2 f) Evaluate one's own success in a completed learning task</p> <p>3-5 g) Develop independent study skills</p> <p>6-8 i) Evaluate one's own success in a completed learning task</p> <p>9-12 j) Evaluate one's own success in a completed learning Task</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>B: Apply reading strategies in all academic areas including math, science and social studies</p> <p>PK-2 o) Make inferences from implicit information</p> <p>3-8 s) Make inferences from implicit information</p> <p>9-12 t) Make inferences from implicit information</p> <p>2-3: Use strategies to become independent learners in academic settings</p> <p>C: Apply writing strategies in all academic area including math, science and social studies</p> <p>PK-2 n) Use elaboration and specific details</p> <p>3-8 p) Use elaboration and specific details</p> <p>9-12 q) Use elaboration and specific details</p>
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	C: Apply writing strategies in all academic areas including math, science and social studies PK-12 i) Engage in discussion with peers	
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Standard for Mathematical Practice 4

STUDENTS' ROLE:

- Model problem situations symbolically, graphically, and contextually
- Connect and explain the connections between different representations
- Use all the different representations as appropriate to a problem context
- Modeling is defined as the act of constructing a mathematical representation of a situation (not a noun)

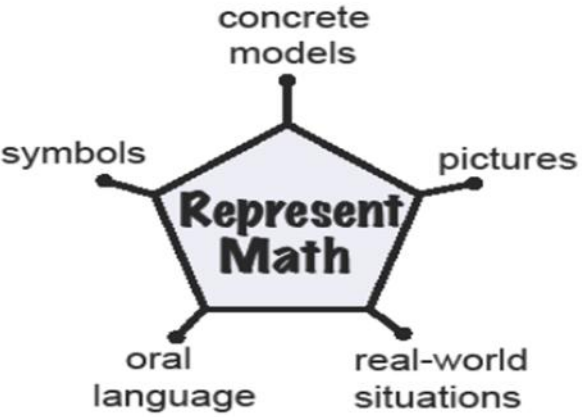
Model with mathematics



I can recognize math in everyday life and use math I know to solve everyday problems.

I can...

- ◆ make assumptions and estimate to make complex problems easier
- ◆ identify important quantities and use tools to show their relationships
- ◆ evaluate my answer and make changes if needed



The diagram features a central pentagon with the words "Represent Math" inside. Five lines extend from the vertices of the pentagon to labels: "concrete models" at the top, "symbols" at the top-left, "pictures" at the top-right, "oral language" at the bottom-left, and "real-world situations" at the bottom-right.

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Jordan School District 2011, Grade 6

Standard for Mathematical Practice-5

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

Beginning: At this level, students have limited or no understanding of English.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
- PK-12 g)** Request and share classroom materials

2-2: Use English to participate orally in academic settings

- C:** Develop research skills in all academic areas including math, science and social studies
- PK-2 d)** Use available technology to gather information
- 3-12 e)** Use available technology to gather information

2-3: Use strategies to become independent learners in academic settings

- B:** Apply reading strategies in all academic areas including math, science and social studies
- PK-12 c)** Make inferences from visuals

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
- PK-12 i)** Use personal experiences to add to a discussion

2-2: Use English to read and write in academic settings

- C:** Develop research skills in all academic areas including math, science and social studies
- 6-12 g)** Select and organize information from appropriate sources for a specific purpose

2-3: Use strategies to become independent learners in academic settings

- A:** Apply cognitive strategies in all academic areas including math, science and social studies
- PK-12 e)** Use self-monitoring and self-

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
- 6-12 s)** Evaluate information for relevancy

2-2: Use English to read and write in academic settings

- C:** Develop research skills in all academic areas including math, science and social studies
- 3-5 h)** Select and organize information from appropriate sources for a specific purpose
- 6-12 k)** Locate and research information on academic topics from multiple sources
- 6-12 l)** Draw conclusions from selected sources

2-3: Use strategies to become independent learners in academic settings


<p>2-3: Use strategies to become independent learners in academic settings. C: Apply writing strategies in all academic areas including math, science and social studies PK-12 a) Construct a chart or other graphic</p>	<p>correcting strategies</p> <p>2-3: Use strategies to become independent learners in academic settings C: Apply writing strategies in all academic areas including math, science and social studies PK-12 k) Use technology to enhance writing</p>	<p>A: Apply cognitive strategies in all academic areas including math, science and social studies PK-2 f) Evaluate one's own success in a completed learning task 3-5 g) Develop independent study skills 6-8 i) Evaluate one's own success in a completed learning task 9-12 j) Evaluate one's own success in a completed learning task</p>
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Standard for Mathematical Practice 5

STUDENTS' ROLE:

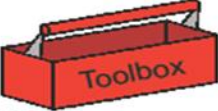
- Mathematically proficient students:
 - o are sufficiently familiar with appropriate tools to decide when each tool is helpful, knowing both the benefit and limitations
 - o detect possible errors
 - o identify relevant external mathematical resources, and use them to pose or solve problems

Use appropriate tools strategically



I know when to use certain tools to help me explore and deepen my math understanding.

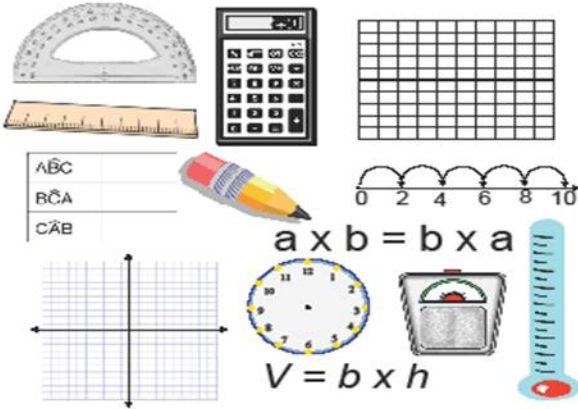
I have a math toolbox.



◆ I know ***HOW*** to use math tools.

◆ I know ***WHEN*** to use math tools.

◆ I can reason: ***"Did the tool I used give me an answer that makes sense?"***



$a \times b = b \times a$

$V = b \times h$

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Jordan School District 2011, Grade 6

Standard for Mathematical Practice-6

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

Beginning: At this level, students have limited or no understanding of English.

2-1: Use English to participate orally in academic settings

- A:** Follow oral and written directions
PK-12 a) Repeat modeled language

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
PK-12 f) Respond to basic feedback appropriately

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
PK-12 c) Develop vocabulary
PK-2 f) Demonstrate comprehension of text through gestures and simple responses
PK-12 g) Develop fluency

2-2: Use English to read and write in academic settings

- B:** Develop writing skills in all academic areas

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
PK-12 h) Express and defend opinions
PK-12 j) Contribute relevant ideas to a discussion
3-12 m) Use formal language to negotiate and reach consensus

2-2: Use English to read and write in academic settings

- A:** Develop reading skills in all academic areas including math, science and social studies
PK-2 i) Expand academic vocabulary
3-12 j) Expand academic vocabulary

2-2: Use English to read and write in academic settings

- B:** Develop writing skills in all academic areas including math, science and social studies
9-12 q) Organize ideas for a relevant and logical argument

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

- B:** Negotiate and manage interaction to accomplish tasks
K-2 l) Modify a statement made by a peer
3-5 o) Modify a statement made by a peer
6-12 p) Modify a statement made by a peer
6-12 r) Elaborate on and extend the ideas of others

2-1: Use English to participate orally in academic settings

- C:** Follow the conventions of standard English
PK-2 h) Communicate clearly and precisely
3-12 i) Communicate clearly and precisely

2-2: Use English to read and write in academic settings

- C:** Develop research skills in all academic areas including math, science and social studies
PK-2 f) Present results of a research project
3-5 g) Present results of a research project
6-12 h) Present results of a research project


<p>including math, science and social studies PK-12 e) Produce original sentences</p> <p>2-2: Use English to read and write in academic settings C: Develop research skills in all academic areas including math, science and social studies PK-2 b) Use appropriate visual and auditory sources 3-12 c) Use appropriate visual, print and auditory sources</p> <p>2-3: Use strategies to become independent learners in academic settings A: Apply cognitive strategies in all academic areas including math, science and social studies PK-12 b) Rehearse and visualize information</p> <p>2-3: Use strategies to become independent learners in academic settings C: Apply writing strategies in all academic areas including math, science and social studies PK-12 a) Construct a chart or other graphic PK-12 d) Make lists</p>	<p>2-2: Use English to read and write in academic settings C: Develop research skills in all academic areas including math, science and social studies 6-12 g) Select and organize information from appropriate sources for a specific purpose</p> <p>2-3: Use strategies to become independent learners in academic settings A: Apply cognitive strategies in all academic areas including math, science and social studies 3-12 f) Construct learning aids</p> <p>2-3: Use strategies to become independent learners in academic settings C: Apply writing strategies in all academic areas including math, science and social studies PK-12 j) Use graphic organizers to plan writing PK-12 k) Use technology to enhance writing</p>	<p>3-5 h) Select and organize information from appropriate sources for a specific purpose</p> <p>2-3: Use strategies to become independent learners in academic settings B: Apply reading strategies in all academic areas including math, science and social studies 3-8 u) Use knowledge of common word parts to learn new words and aid in comprehension 9-12 v) Use knowledge of common word parts to learn new words and aid in comprehension</p> <p>2:3: Use strategies to become independent learners in academic settings C: Apply writing strategies in all academic areas including math, science and social studies PK-2 n) Use elaboration and specific details 3-8 p) Use elaboration and specific details 9-12 q) Use elaboration and specific details</p>
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Standard for Mathematical Practice 6

STUDENTS' ROLE:

- Use clear and precise language/definitions in their discussions with others and in their own reasoning.
- State the meaning of symbols
- Specify units of measure
- Calculate accurately and efficiently with an appropriate degree of precision for the problem context

Attend to precision



I can use precision when solving problems and communicating my ideas.

Problem Solving

- ◆ I can calculate *accurately*.
- ◆ I can calculate *efficiently*.
- ◆ My answer matches what the problem asked me to do – *estimate* or find an *exact answer*.

Communicating

- ◆ I can **SPEAK**, **READ**, **WRITE**, and **LISTEN** mathematically.
- ◆ I can correctly use...
 - math **symbols**
 - math **vocabulary**
 - **units of measure**

Standard for Mathematical Practice-7

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing and auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than five for any real numbers x and y .

Beginning: At this level, students have limited or no understanding of English.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

3-12 n) Listen to incorporate feedback

2-2: Use English to read and write in academic settings

A: Develop reading skills in all academic areas including math, science and social studies

PK-12 a) Activate prior knowledge

PK-12 e) Connect prior knowledge to new information

2-3: Use Strategies to become independent learners

B: Apply reading strategies

PK-12 b) Make connections to prior knowledge

PK-12 c) Make inferences from visuals

PK-12 d) Make, verify and revise predictions

PK-12 f) Use context to construct meaning

PK-12 h) Use graphic organizers to enhance

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-3: Use strategies to become independent learners in academic settings

B: Apply reading strategies in all academic areas including math, science and social studies

PK-12 k) Make inferences from explicit information

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

PK-2 l) Modify a statement made by a peer

3-5 o) Modify a statement made by a peer

6-12 p) Modify a statement made by a peer

2-2: Use English to read and write in academic settings

A: Develop reading skills in all academic areas including math, science and social studies

3-5 u) Analyze, synthesize and construct meaning from text

6-12 v) Analyze, synthesize and construct meaning from text

2-3: Use strategies to become independent learners in academic settings

A: Apply cognitive strategies in all academic areas including math, science and social

comprehension		studies PK-2 f) Evaluate one's own success in a completed learning task 3-5 g) Develop independent study skills 6-8 i) Evaluate one's own success in a completed learning task 9-12 j) Evaluate one's own success in a completed learning task
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Standard for Mathematical Practice 7


STUDENTS' ROLE:

- Mathematically proficient students:
 - o Look closely to discern a pattern or structure to model and solve problems
 - o Step back for an overview and shift perspective
 - o See complicated things as single objects, or as composed of several objects

Students should be able to:

- Look for patterns or structures to model and solve problems (Example: Addition is the same, no matter which number system is used. To add, one must add like units.)

Look for and make use of structure



I can see and understand how numbers and spaces are organized and put together as parts and wholes.

Numbers

For Example:

- ◆ Base 10 structure
- ◆ operations and properties
- ◆ terms, coefficients, exponents







	10	+	3	
10	100		30	
+				
5	50		15	

13×15
 $(10 + 3) \times (10 + 5)$
 $100 + 30 + 50 + 15$
195

Spaces

For Example:

- ◆ dimension
- ◆ location
- ◆ attributes
- ◆ transformation

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Jordan School District 2011, Grade 6

Standard for Mathematical Practice-8

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x-1)(x+1)$, $(x-1)(x^2+x+1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Beginning: At this level students have limited or no understanding of English.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

3-12 n) Listen to incorporate feedback

2-2: Use English to read and write in academic settings

A: Develop reading skills in all academic areas including math, science and social studies

PK-12 a) Activate prior knowledge

PK-12 e) Connect prior knowledge to new information

2-3: Use Strategies to become independent learners

B: Apply reading strategies

PK-12 b) Make connections to prior knowledge

PK-12 c) Make inferences from visuals

PK-12 d) Make, verify and revise predictions

PK-12 f) Use context to construct meaning

PK-12 h) Use graphic organizers to enhance comprehension

Intermediate: At this level, students understand more complex speech but may require some repetition.

2-3: Use strategies to become independent learners in academic settings

A: Apply cognitive strategies in all academic areas including math, science and social studies

PK-12 e) Use self-monitoring and self-correcting strategies

2-3: Use strategies to become independent learners in academic settings

B: Apply reading strategies in all academic areas including math, science and social studies

PK-12 l) Make and verify hypotheses while reading (*does this really fit here? Is this too much of a stretch?*)

Advanced: At this level, the students' language skills are adequate for most day-to-day communication needs.

2-1: Use English to participate orally in academic settings

B: Negotiate and manage interaction to accomplish tasks

PK-2 l) Modify a statement made by a peer

3-5 o) Modify a statement made by a peer

6-12 p) Modify a statement made by a peer

2-2: Use English to read and write in academic settings

A: Develop reading skills in all academic areas including math, science and social studies

3-5 u) Analyze, synthesize and construct meaning from text

6-12 v) Analyze, synthesize and construct meaning from text

2-3: Use strategies to become independent learners in academic settings

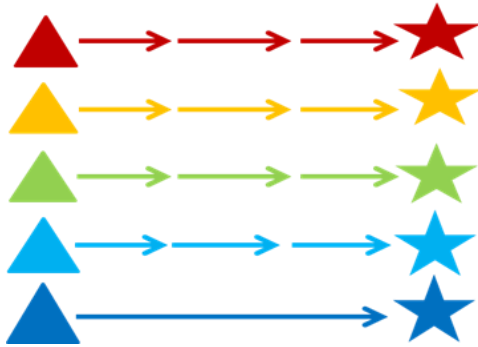
A: Apply cognitive strategies in all academic areas including math, science and social studies

		<p>PK-2 f) Evaluate one's own success in a completed learning task</p> <p>3-5 g) Develop independent study skills</p> <p>6-8 i) Evaluate one's own success in a completed learning task</p> <p>9-12 j) Evaluate one's own success in a completed learning task</p>
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Standards for Mathematical Practice

STUDENTS' ROLE:

- Mathematically proficient students:
 - o Notice if calculations are repeated and look for both general methods and for shortcuts
 - o Use repeated reasoning to understand algorithms, make generalizations about patterns, derive formulas
 - o Maintain oversight of the process while attending to the details, as they work to solve a problem
 - o Continually evaluate the reasonableness of their intermediate results



Look for and express regularity in repeated reasoning



I can notice when calculations are repeated. Then, I can find more efficient methods and short cuts.

For example: $25 \div 11$

$$\begin{array}{r} 2.2727 \\ 11 \overline{)25.0000} \\ \underline{-22} \\ 30 \\ \underline{-22} \\ 80 \\ \underline{-77} \\ 30 \\ \underline{-22} \\ 80 \\ \underline{-77} \\ 30 \end{array}$$

I am repeating this calculation. The quotient is a repeating decimal.

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