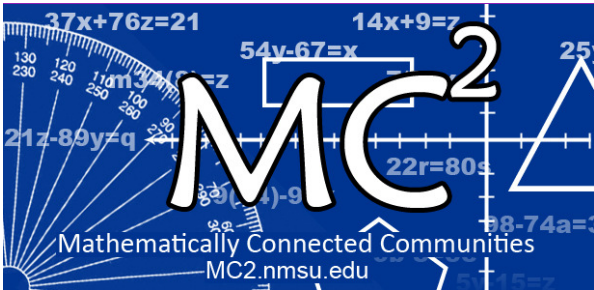


January 29, 2015
Webinar

Count Down to

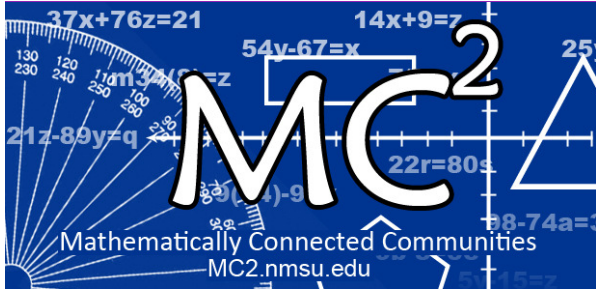
PARCC

Partnership for Assessment of
Readiness for College and Careers



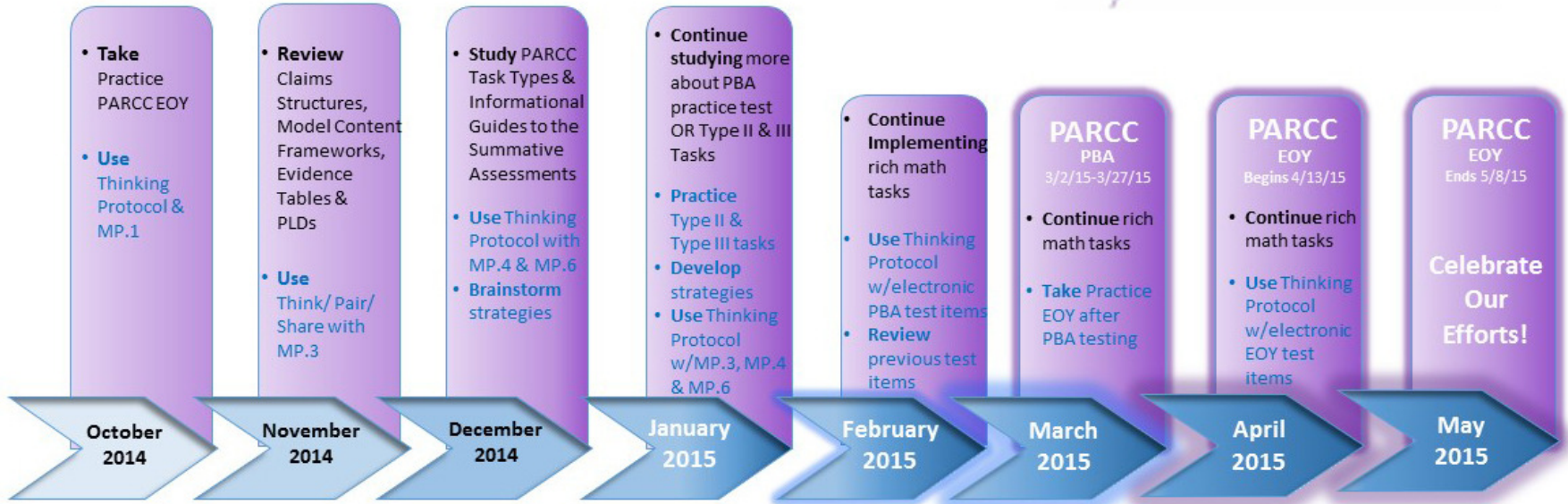
Webinar Agenda...

- Overview of Countdown to PARCC Format (2 min.)
- Description of Resources for Teacher Planning (20 min.) to prepare for PBA
- Description of Suggestions for Math Practices in the Classroom (10 min.)
- Q & A – Please type in questions that you would like for us to address (10 min.)



Monthly Resources for Teachers

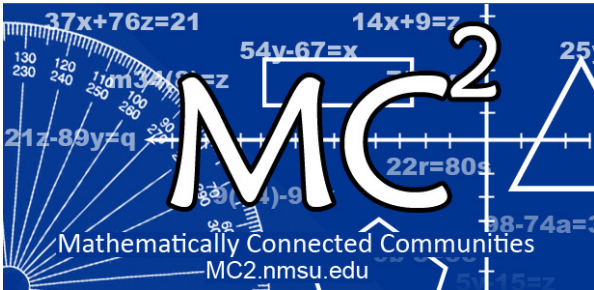
MC² Countdown to PARCC



Color Code Key: Teacher Support & Classroom Strategies

*The bulleted tasks above are recommended by MC² to assist teachers in preparing for PARCC.

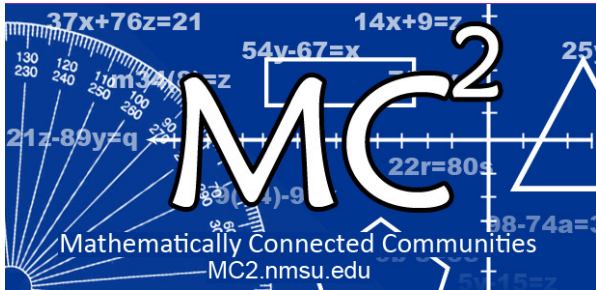
Click on the image to enlarge the graphic.



Aligned to CCSS-M with Emphasis on Math Practices 1, 3, 4, and 6

- 1. Make sense of problems and persevere in solving them.**
2. Reason abstractly and quantitatively
- 3. Construct viable arguments and critique the reasoning of others**
- 4. Model with Mathematics**
5. Use appropriate tools strategically
- 6. Attend to precision**
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning





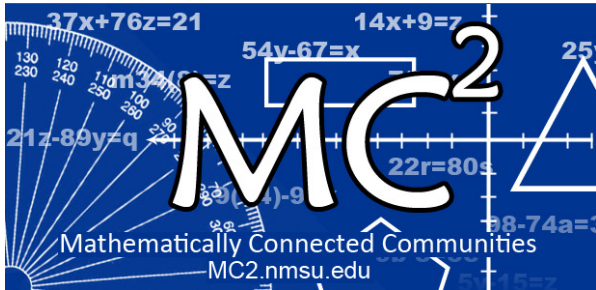
What can you expect to find on the Countdown each month?

Supports/Resources for Teachers

- Suggestions for teachers to develop a solid understanding of PARCC expectations for students
- Ideas for using the PARCC website and your curriculum resources to design activities for students

Supports for Daily/Weekly Classroom Instruction to:

- Build student **confidence and competence** with PARCC assessment items and solving various and complex tasks
- Develop students' **critical thinking** skills in mathematics and habits of minds outlined in the CCSS-M Standards for **Mathematical Practice**
- Develop familiarity with test item technology (**testnav**) and the various types of assessment items that students will encounter on PARCC assessments



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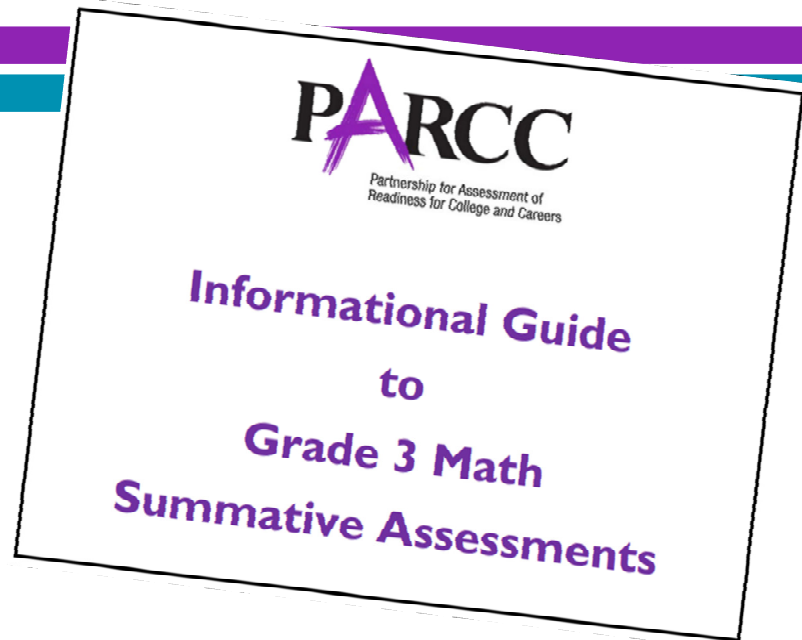
PARCC Mathematics Test

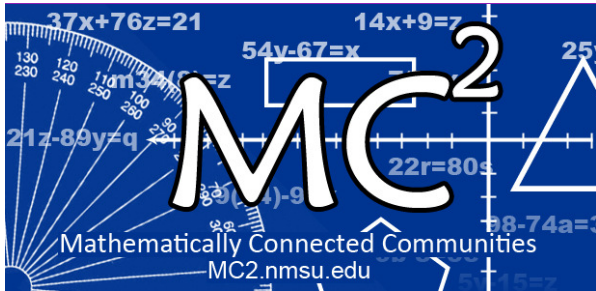
Documents:

<http://www.parcconline.org/mathematics-test-documents>

Contents:

- Claims Structure
- Task Types
- High Level Blue Prints
- Grade Specific Evidence Statements
(Listed by PBA, EOY, and PBA/EOY Combination)





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Claims Structure*: Mathematics - Grade 7

Master Claim: On-Track for college and career readiness. The degree to which a student is college and career ready (or “on-track” to being ready) in mathematics. The student solves grade-level/course-level problems in mathematics as set forth in the Standards for Mathematical Content with connections to the Standards for Mathematical Practice.

Sub-Claim A: Major Content¹ with Connections to Practices

The student solves problems involving the Major Content¹ for her grade/course with connections to the Standards for Mathematical Practice.

43 points

Sub-Claim B: Additional & Supporting Content² with Connections to Practices

The student solves problems involving the Additional and Supporting Content² for her grade/course with connections to the Standards for Mathematical Practice.

13 points

Sub-Claim C: Highlighted Practices MP.3 and MP.6 with Connections to Content³ (expressing mathematical reasoning)

The student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others, and/or attending to precision when making mathematical statements.

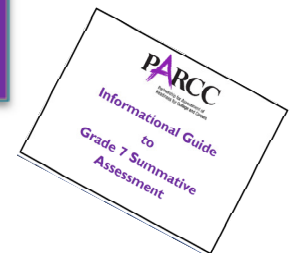
14 points

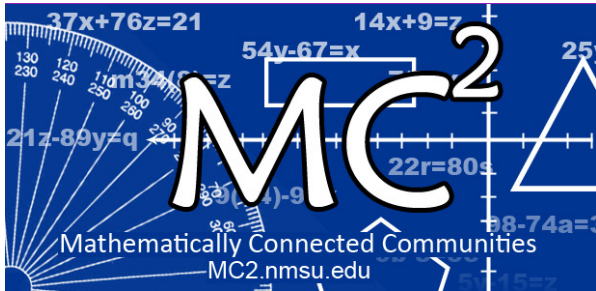
Sub-Claim D: Highlighted Practice MP.4 with Connections to Content (modeling/application)

The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), *engaging particularly in the Modeling practice*, and where helpful, making sense of problems and persevering to solve them (MP.1), reasoning abstractly and quantitatively (MP.2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).

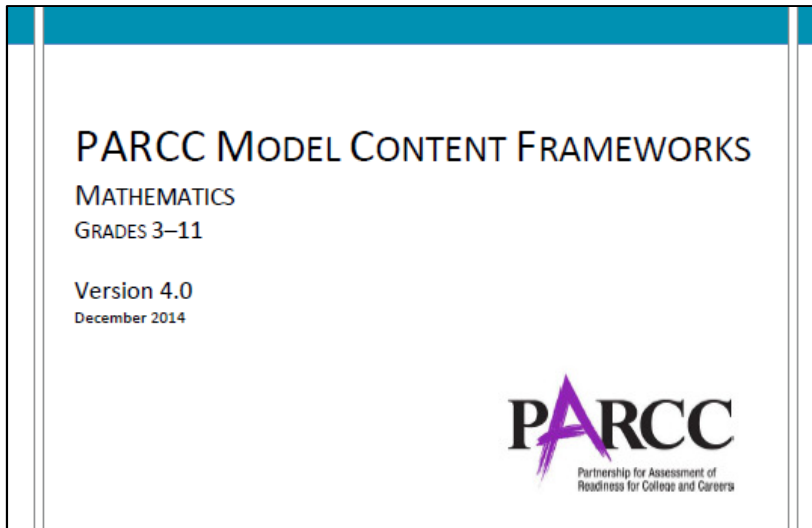
12 points

Total Exam
Score Points:
82





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http://parcconline.org/sites/parcc/files/PARCC_MCF_Mathematics-12-11-2014.pdf

7th Grade Content Clusters

Key: ■ Major Clusters; ■ Supporting Clusters; ● Additional Clusters

Ratios and Proportional Reasoning

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.

Expressions and Equations

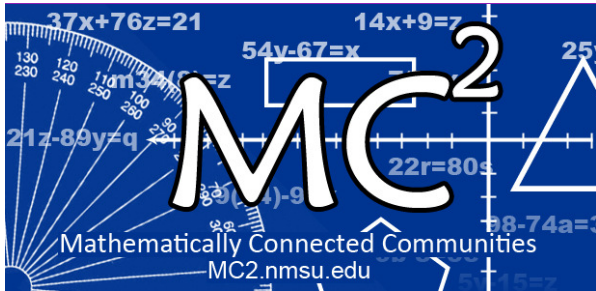
- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry

- Draw, construct and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area and volume.

Statistics and Probability

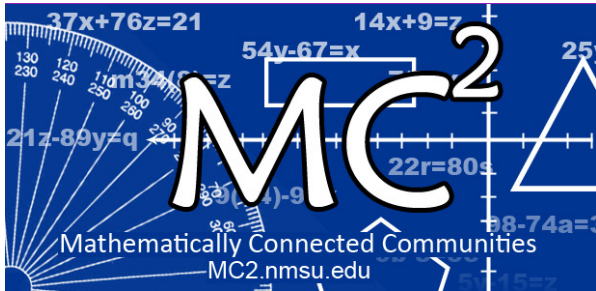
- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.



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Overview of PARCC Mathematics Task Types

Task Type	Description	Reporting Categories	Scoring Method	Mathematical Practice(s)	Summative Assessment
Type I	conceptual understanding, fluency, and application	Sub-Claim A: Solve problems involving the <u>major content</u> for the grade level Sub-Claim B: Solve problems involving the <u>additional and supporting content</u> for the grade level	computer-scored only	can involve any or all practices	EOY and PBA
Type II	written arguments/justifications, critique of reasoning, or precision in mathematical statements	Sub-Claim C: Express mathematical <u>reasoning</u> by constructing mathematical arguments and critiques	computer- and hand-scored tasks	primarily MP.3 and MP.6, but may also involve any of the other practices	PBA only
Type III	modeling/application in a real-world context or scenario	Sub-Claim D: solve real-world problems engaging particularly in the <u>modeling</u> practice	computer- and hand-scored tasks	primarily MP.4, but may also involve any of the other practices	PBA only



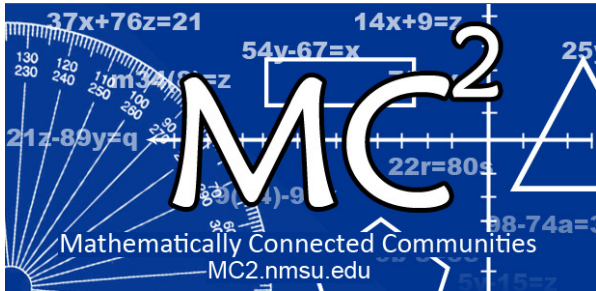
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Performance-Based Summative Assessment (PBA)			
	Task Type/ Point Value	Number of Tasks	Total Points
Number and Point Values for each Task Type	Type I 1 Point	8	8
	Type I 2 Point	2	4
	Type II 3 Point	2	6
	Type II 4 Point	2	8
	Type III 3 Point	2	6
	Type III 6 Point	1	6
	Total		17
Percentage of Assessment Points by Task Type	Type I	(12/38) 32%	
	Type II	(14/38) 36%	
	Type III	(12/38) 32%	

End-of-Year Summative Assessment (EOY)			
Task Type/ Point Value	Number of Tasks	Total Points	Percent of Test
Type I 1 Point	24	24	55%
Type I 2 Point	8	16	36%
Type I 4 points	1	4	9%
Total	33	44	100%

Grade 7

High Level Blueprints - Mathematics



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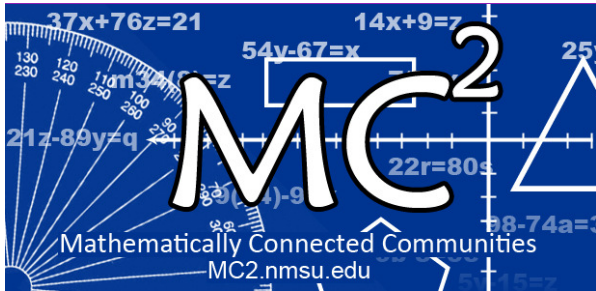
Grade 8 Evidence Statements

PBA Only

PBA and EOY

EOY Only

Subclaim	Evidence Statement Key	Evidence Statement Text	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP's	Calculator
C	8.C.1.1	Base reasoning on the principle that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. Content Scope: Knowledge and skills articulated in 8.EE.6	PBA i) Tasks require students to derive the equation $y=mx$ for a line through the origin and the equation $y=mx+b$ for a line intersecting the vertical axis at b .	MP.2 MP.3 MP.7 MP.8	Yes
C	8.C.1.2	Base reasoning on the principle that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. Content Scope: Knowledge and skills articulated in 8.EE.8a	PBA -	MP.2 MP.3 MP.5 MP.6 MP.7	Yes
C	8.C.2	Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any). Content Scope: Knowledge and skills articulated in 8.EE.7a, 8.EE.7b, 8.EE.8b	PBA i) Tasks may have three equations, but students are only required to analyze two equations at a time.	MP.3 MP.6	Yes
C	8.C.3.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in 8.F.3-2	PBA i) Tasks require students to justify whether a given function is linear or nonlinear.	MP.3 MP.6	Yes
C	8.C.3.2	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in 8.G.2, 8.G.4	PBA -	MP.3 MP.5 MP.6	Yes



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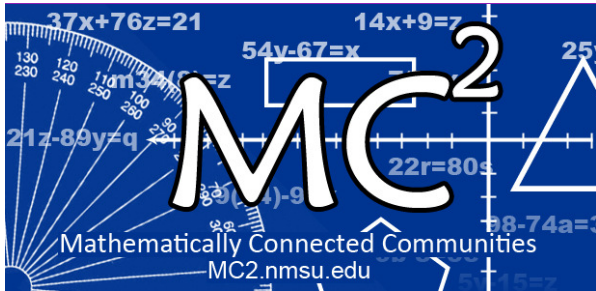
Grade 8 Evidence Statements

PBA Only

PBA and EOY

EOY Only

Subclaim	Evidence Statement Key	Evidence Statement Text	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MPs	Calculator
A	8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. <i>For example, $3^2 \times 3^5 = 1/3^3 = 1/27$</i>	<p>PBA/EOY</p> <ul style="list-style-type: none"> i) Tasks do not have a context. ii) Tasks focus on the properties and equivalence, not on simplification. iii) Half of the expressions involve one property; half of the expressions involves two or three properties. iv) Tasks should involve a single common base or a potential common base, such as, a task that includes 3, 9 and 27. 	MP.7	No
A	8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. <i>For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.</i>	<p>PBA/EOY</p>	MP.4	No
A	8.EE.4-1	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.	<p>PBA/EOY</p> <ul style="list-style-type: none"> i) Tasks have "thin context"² or no context. ii) Rules or conventions for significant figures are not assessed. iii) Some of the tasks involve both decimal and scientific notation. 	MP.6 MP.7 MP.8	No
A	8.EE.4-2	Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	<p>PBA/EOY</p> <ul style="list-style-type: none"> i) Tasks have "thin context". ii) Tasks require students to recognize $3.7E-2$ (or $3.7e-2$) from technology as 3.7×10^{-2}. 	MP.6 MP.7 MP.8	Yes
A	8.EE.5-1	Graph proportional relationships, interpreting the unit rate as the slope of the graph.	<p>PBA/EOY</p> <ul style="list-style-type: none"> i) Tasks may or may not contain context. 	MP.1 MP.5	Yes



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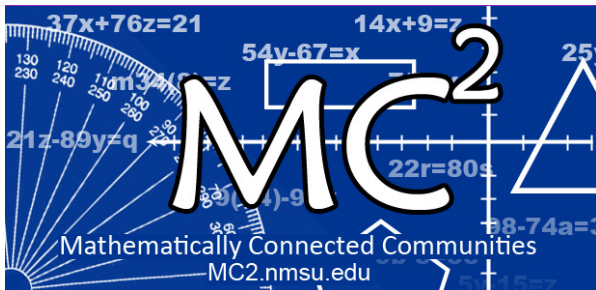
Grade 8 Evidence Statements

PBA Only

PBA and EOY

EOY Only

Subclaim	Evidence Statement Key	Evidence Statement Text	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MPs	Calculator
B	8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion, which repeats eventually into a rational number.	EOY i) Tasks do not have a context. ii) An equal number of tasks require students to write a fraction a/b as a repeating decimal, or write a repeating decimal as a fraction. iii) For tasks that involve writing a repeating decimal as a fraction, the given decimal should include no more than two repeating decimals, i.e. 2.16666..., 0.23232323...	MP.7 MP.8	No
B	8.NS.2	Use rational approximations of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g. π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	EOY i) Tasks do not have a context.	MP.5 MP.7 MP.8	No
A	8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2=p$ and $x^3=p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	EOY i) Tasks may or may not have a context. ii) Students are not required to simplify expressions such as $\sqrt{8}$ to $2\sqrt{2}$. Students are required to express the square roots of 1, 4, 9, 16, 25, 36, 49, 64, 81 and 100; and the cube roots of 1, 8, 27, and 64.	MP.7	No
A	8.EE.6-1	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.	EOY i) Tasks do not have a context.	MP.2 MP.7	Yes
			EOY		



January – For Teachers PARCC Information Guide

Grade 8 Assessment Policies

Calculators:

- PARCC mathematics assessments allow a scientific calculator in Grade 8.
- For students who meet the guidelines in the *PARCC Accessibility Features and Accommodations Manual* for a calculation device, this accommodation allows a calculation device to be used on the non-calculator section of any PARCC mathematics assessment. The student will need a hand-held calculator because an online calculator will not be available. If a student needs a specific calculator (e.g., large key, talking), the student can also bring his or her own, provided it is specified in his or her approved IEP or 504 Plan and meets the same guidelines.

Scratch Paper (required):

- Blank scratch paper (graph, lined or un-lined paper) is intended for use by students to take notes and work through items during testing. At least two pages per unit must be provided to each student. Any work on scratch paper will **not** be scored.

Allowable Geometry Tools:

- A protractor, tracing paper, reflection tools, straight edge, and compass are allowable materials for the grade 8 assessments.
- If schools allow students to bring their own tools, they must be given to the school test coordinator or test administrator prior to testing to ensure that the tools are appropriate for testing (e.g., tools do not have any writing on them).

Mathematics Reference Sheet:

Triangle	$A = \frac{1}{2}bh$	Cylinder	$V = \pi r^2 h$
Parallelogram	$A = bh$	Sphere	$V = \frac{4}{3}\pi r^3$
Circle	$A = \pi r^2$	Cone	$V = \frac{1}{3}\pi r^2 h$

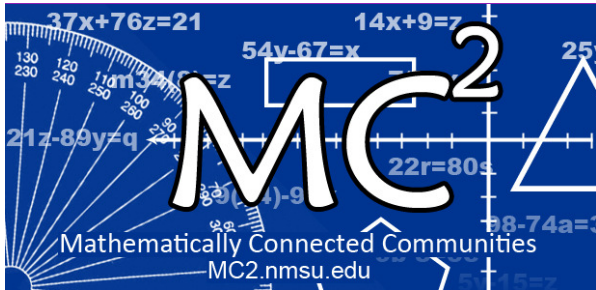
The logo for Mathematically Connected Communities (MC2) is displayed on a blue background. It features the letters 'MC2' in a large, white, stylized font. Surrounding the logo are various mathematical elements: a protractor on the left, several linear equations (e.g., $37x+76z=21$, $14x+9=z$, $54y-67=x$, $21z-89y=q$, $22r=80s$, $88-74a=3$), and a right-angled triangle on the right. At the bottom of the logo area, the text 'Mathematically Connected Communities' and the website 'MC2.nmsu.edu' are visible.

January – For Teachers Take the PBA Practice Test

- **Take the PBA Practice Test:** <http://parcc.pearson.com/practice-tests/#>
- **Complete the written explanations** as students are expected to do.
- **Use the scoring rubrics** to understand the expectations.

Discuss with Colleagues:

- What are the mathematical expectations of the PBA? How do the questions align to the CCSS-M standards at your grade level?
- What kinds of mathematical reasoning are necessary to be successful in the written responses?
- What technology experiences do students need in order to be successful with the testing format?



January – For Teachers Plan Instruction for February

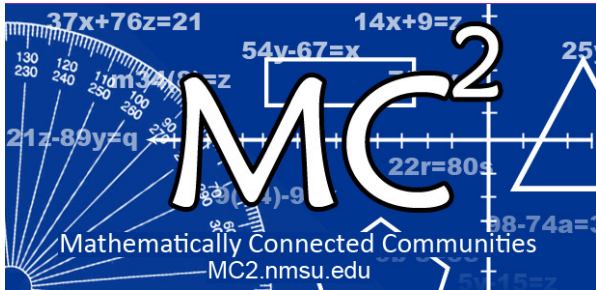
Review your current curriculum and instructional resources

- Consider how well the resources are aligned to the CCSS-M
- Modify lessons to match expectations of CCSS-M and PARCC



Discuss/Plan with Colleagues:

- ❖ What experiences do students need with the CCSS-M content and math practices to successfully solve the PARCC PBA problems?
- ❖ Find mathematical tasks that prepare students for the expectations of PARCC PBA.
- ❖ Use PARCC Practice Items and tasks from www.illustrativemathematics.org as instructional activities if you're unsure where to begin.

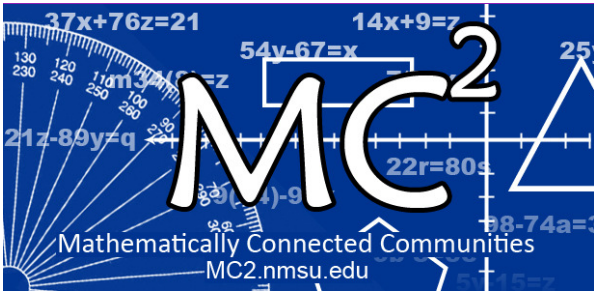


January – For Teachers PARCC Test Prep

MC² agrees with the PARCC statement...

“There’s no need for “test prep” in the traditional sense:

- Because the test is deeply aligned to the standards – a curriculum aligned to standards would be most effective*
- Because the test questions and tasks require students to show their understanding of concepts, their ability to write, capacity to reason mathematically, and the ability to apply these skills*
- You can’t drill for that – but effective and engaging teaching all year long will prepare students”*



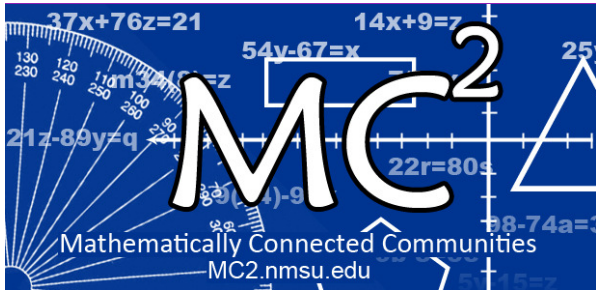
For the Classroom

Use the *MC² Thinking Protocol* for sample PARCC items
1-2 per week as a class warm-up or formative assessment

Thinking Protocol (15-20 min.):

1. Students think individually about the test item. (3 min.)
2. Think with a partner about the problem. Change colored writing utensils to add to the solution. Don't erase from your original ideas. (5 min.)
3. Share strategies. Teacher selects 2-3 students or partners to share their ideas. The purpose is to add new ideas/strategies to the whole group's thinking. (6 min.)
4. Ask students to reflect on the problem and identify what was easy about the problem. What required more effort? (1 min.)

Go to: <http://mc2.nmsu.edu/>



For the Classroom (continued)

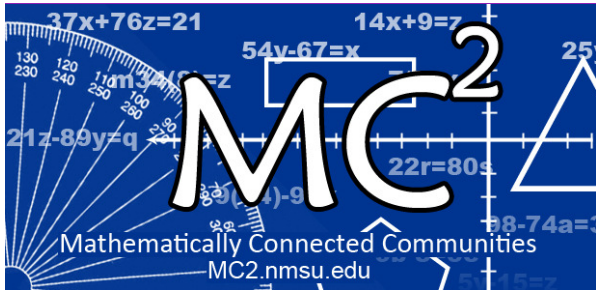
Thinking/Writing Prompts to Promote Mathematical Practices in the Thinking Protocol

Math Practice 1: **Make sense of problems and persevere in solving them.**

1. What do I know about the problem?
2. What questions do I have?
3. Explain your reasoning or thinking in solving the problem.

Math Practice 3: **Construct viable arguments and critique the reasoning of others.**

1. What are the assumptions, definitions, and previous knowledge to help in thinking about this problem?
2. What are some possible conjectures that you have about the problem?
3. Explain your mathematical argument so that somebody else can make sense of your thinking.



For the Classroom (continued)

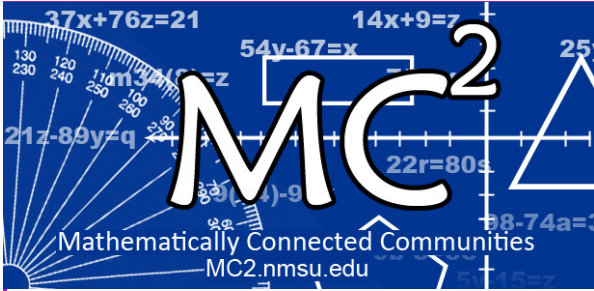
Thinking/Writing Prompts to Promote Mathematical Practices in the Thinking Protocol

Math Practice 4: Model with mathematics.

1. What are the important quantities in the problem that are needed to solve it?
2. What mathematical operation(s) or representation(s) will you use to solve the problem?
3. Explain how you know your answer makes sense in the context of the situation.

Math Practice 6: Attend to precision.

1. What are the important units in the problem? (What are we measuring or counting?)
2. What relationship between the units/quantities do you need to know in order to solve the problem?
3. Use appropriate and precise mathematical language, units, labels and computations to clearly describe your mathematical reasoning.



For the Classroom (continued)

4th Grade PARCC PBA Sample Assessment Standard 4.NF.A:
Extend understanding of fraction equivalence and ordering

For Example:

Math Practice Prompts

1. Explain your mathematical argument so that somebody else can make sense of your thinking. (MP.3)
2. Explain how you know your answer makes sense. (MP.4)

Ava and Mia are comparing the fractions $\frac{3}{2}$ and $\frac{5}{6}$.

PART A: Ava created this number line to graph $\frac{3}{2}$.

Select the correct point on the number line to represent $\frac{3}{2}$.



Mia created this number line to graph $\frac{5}{6}$.

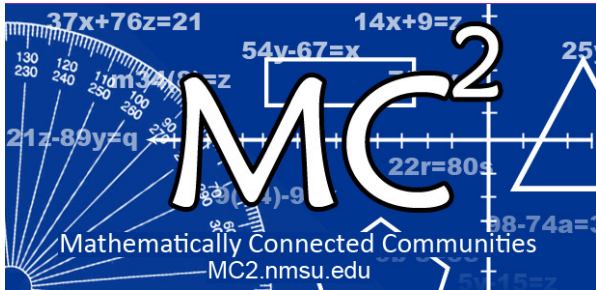
Select the correct point on the number line to represent $\frac{5}{6}$.



PART B: Is $\frac{3}{2}$ greater than or less than $\frac{5}{6}$? Explain how you know.

PART C: Write a fraction that is between $\frac{3}{2}$ and $\frac{5}{6}$.

Explain how you know your fraction is between $\frac{3}{2}$ and $\frac{5}{6}$.

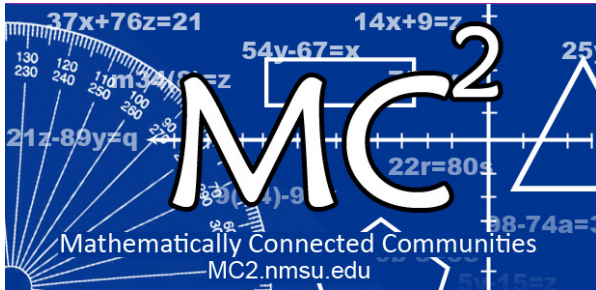


For the Classroom (continued)

Use rich mathematical tasks in class that promote MP.3:
Construct viable arguments and critique the reasoning of others

Sentence Frames for teachers to use in their classrooms:

- I made a conjecture when I...
- I justified my conclusion by...
- I constructed a viable argument when...
- I made sense of another's argument when I ...
- A question I asked to help clarify my own or someone else's thinking was...

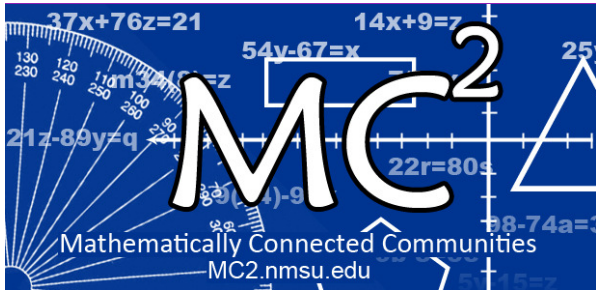


For the Classroom (continued)

Use rich mathematical tasks in class that promote MP.4: **Model with Mathematics**

Sentence Frames for teachers to use in their classrooms:

- The important quantities in this problem are ____ because ____.
- I estimate the answer to be ____ because ____.
- I decided to represent the problem by (table, equation, graph, diagram, flow-chart, formula, etc.) ____ because ____.
- The equation I used to represent the problem matches my mathematical thinking because ____.
- I changed my strategy when ____.

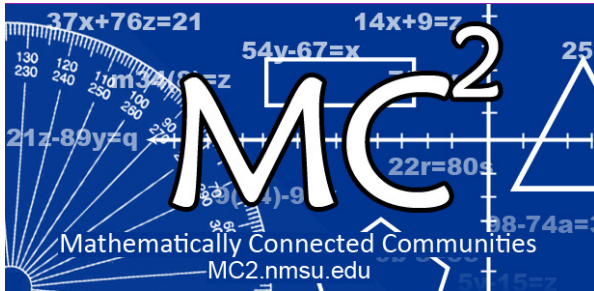


For the Classroom (continued)

Use rich mathematical tasks in class that promote MP.6: **Attend to Precision**

Sentence Frames for teachers to use in their classrooms:

- The explanation could be stronger if _____.
- I examined _____ claim and offered _____ to make it clearer.
- We checked the accuracy of our calculations by _____.
- I used _____ vocabulary in the anchor chart to make my communication precise.
- We know the equal sign was used appropriately because _____.
- In this problem, our symbols and variables represent _____.
- The use of units helped me to make sense of the problem when _____.



Thank You!

Please email MC² at mc2@nmsu.edu, if you have any:

- Questions
- Comments or suggestions for future webinars. We are considering content for our next webinar.

We appreciate your feedback.