

Louisiana Guide to PARCC Mathematics Assessments Grades 6-8

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I. Purpose of Assessment Guide

This document is designed to assist Louisiana educators in understanding the PARCC assessments for grades 6-8 which will be implemented beginning in Spring 2015. **It will continue to be updated as decisions are made by the PARCC consortium with a more detailed version available in Summer 2014.**

II. Introduction to PARCC

In grades 3-8 for English language arts (ELA) and mathematics, Louisiana has chosen to adopt the assessments developed by The Partnership for Assessment of Readiness for College and Careers (PARCC). PARCC is a consortium of 18 states working together to develop ELA and mathematics assessments. The design of the PARCC assessment system is driven by the following priorities:

- Determine whether students are college- and career-ready or on track
- Assess the full range of the Common Core State Standards (CCSS), including standards that are difficult to measure
- Measure the full range of student performance, including the performance of high- and low-performing students
- Provide data during the academic year to inform instruction, interventions and professional development
- Provide data for accountability, including measures of growth
- Incorporate innovative approaches throughout the assessment system

Louisiana has been a member of the PARCC consortium since its inception. As a result, many Louisiana educators at the school, district, state, and college/university levels have and are continuing to serve on various committees. These include, but are not limited to, the development of PARCC's policies and procedures and PARCC's extensive review of assessment tasks that will be taken by Louisiana's students.

III. PARCC Summative Assessments

All local education agencies (LEAs) in Louisiana will administer PARCC’s two summative assessments described below:

The **Performance-Based Assessment (PBA)** is administered after approximately 75% of the school year. While some tasks will be computer-scored, 68% of the assessment for each grade 6-8 will require students to solve real-life problems and to provide reasoning/explanations to support their work.

The **End-of-Year Assessment (EOY)** is administered after approximately 90% of the school year. In the mathematics End-of-Year Assessment, students will demonstrate their ability to understand and use skills identified as [Major, Supporting and Additional content](#) of the grade including mathematical fluency. To be able to provide results quickly, this assessment will have computer-scored tasks only.

These assessments are the focus of this guide. Additional information on the exact content of each assessment can be found in PARCC’s Evidence Statements. [Section VI](#) of this guide provides additional information on Evidence Statements.

IV. Overview of PARCC Mathematics Task Types and Reporting Categories

Each item on the PARCC assessment is referred to as a task and is identified by one of three types: Type I, Type II, and Type III. As shown in the graphic below, each of the three task types is aligned to one of five reporting categories (major content, additional and supporting content, fluency, reasoning, and modeling). The reporting categories are also called sub-claims. Each task type is designed to align with at least one of the [Standards for Mathematical Practice](#) (MP). For each task type, the table provides the method for scoring the task and shows which assessments include the task type.

Task Type	Description	Reporting Categories	Scoring Method	Mathematical Practice(s)	Summative Assessment
Type I	Conceptual understanding, fluency, and application	<p>Sub-claim A: Solve problems involving the major content for the grade level</p> <p>Sub-claim B: Solve problems involving the additional and supporting content for the grade level</p> <p>Sub-claim E: Demonstrate fluency as indicated in the CCSS for grades 3-6</p>	Computer-scored only	Can involve any or all mathematical practice standards	EOY and PBA
Type II	written arguments/justifications, critique of reasoning, or precision in mathematical statements	Sub-claim C: Express mathematical reasoning by constructing mathematical arguments and critiques	a mix of computer-scored 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 modeling practice	a mix of computer-scored and hand-scored tasks	Primarily MP.4, but may also involve any of the other practices	PBA only

Samples of each task type are provided beginning on [page 11](#) in this document. Additional samples are available in pdf format at <http://www.parcconline.org/samples/math> and in interactive format at <http://practice.parcctestnav.com/#>.

V. Design of PARCC’s Summative Assessments for Grades 6-8

Each of PARCC’s summative mathematics assessments in grades 6-8 has a total of 82 points. The Phase I – Performance-Based Assessment has 38 points and Phase II – End-of-Year Assessment has 44 points. Student results on the Performance-Based Assessment will be combined with results on the End-of-Year Assessment to produce an overall mathematics score.

The tables below show the breakdown of task types and point values on PARCC’s mathematics Performance-Based Assessment and End-of-Year Assessments for grades 6 and 7. The total number of tasks (blue), total number of points (green), and the percentage of the total points on the assessment that each type represents (light blue) are included.

Performance-Based Summative Assessment Grades 6 and 7			
	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	38
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 Grade 6			
Task Type/Point Value	Number of Tasks	Total Points	Percent of Test
Type I 1 Point	26	26	59%
Type I 2 Point	7	14	32%
Type I 4 points	1	4	9%
Totals	34	44	100%

End-of-Year Summative Assessment Grade 7			
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%
Totals	33	44	100%

The tables below show the breakdown of task types and point values on PARCC’s mathematics Performance-Based Assessment and End-of-Year Assessment for grade 8. The total number of tasks (blue), total number of points (green), and the percentage of the total points on the assessment that each type represents (light blue) are included.

Performance-Based Summative Assessment Grade 8			
	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	38
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 Grade 8			
Task Type/ Point Value	Number of Tasks	Total Points	Percent of Test
Type I 1 Point	26	26	59%
Type I 2 Point	5	10	23%
Type I 4 points	2	8	18%
Totals	33	44	100%

VI. Evidence Statements

To assist teachers in understanding how the Common Core content and mathematical practice standards will be assessed, PARCC has released Evidence Statements for each grade. Evidence Statements are descriptions of the work that students are expected to do and are used by writers to guide their development of assessment tasks. Evidence Statements describe what within a student's work indicates that the student has mastered a specific standard. The clarifications provide additional information to ensure consistency across tasks written for the same Evidence Statement. One row from the Grade 6 End-of-Year Assessment Evidence Statement table is shown below. The information highlighted in blue is not part of the Evidence Statement, but explains the purpose or provides an interpretation of the information found in each column.

Evidence Statement Key	Evidence Statement Text	Clarifications	Math Practice(s)	Calculator
6.NS.4-1 Connects an Evidence Statement to a content standard (CCSS) or a task type.	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Description of what the task will require students to do.	i) Tasks do not have a context. ii) Tasks require students to find the greatest common factor or the least common multiple only. Clarification (i): The task will not be presented in a word problem. Clarification (ii): Students will find EITHER the greatest common factor OR the least common multiple, but not both in the same task.	- Not all Evidence Statements are aligned to a MP as indicated by the hyphen in this example. If multiple practices are listed, each task need <u>not</u> address all listed.	No Indicates if calculators are allowed on tasks written for the Evidence Statement.

As an example of how a teacher might use Evidence Statements, let's assume that a teacher has written the following task to include on a unit assessment. The teacher indicates the task is aligned to Evidence Statement 6.EE.7.

Mary's mother gave her some money. Mary spent \$2.75 and now has \$1.35 remaining. She wants to know how much money her mother gave her. Mary wrote $x - 2.75 = 1.35$ to help her find the amount of money she received from her mother. Find x , the amount of money that Mary's mother gave her.

Based on the information in Evidence Statement 6.EE.7, would this be considered a PARCC-like task?

Evidence Statement Key	Evidence Statement Text	Clarifications	Math Practice(s)	Calculator
6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q , and x are nonnegative rational numbers	i) Problem situations are of "algebraic" type, not "arithmetic" type. See ITN Appendix E , Table F.d and the Progression for Expressions and Equations , pp. 3, 4. ii) 50% of tasks involve whole number values of p , q , and/or x ; 50% of tasks involve fraction or decimal value of p , q , and/or x . Fractions and decimals should not appear in the same problem. (Cf. 7.EE.3) iii) A valid equation and the correct answer are both required for full credit. iv) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	1, 2, 6, 7	Yes

While a real-life problem, clarification (ii) indicates that the student must provide a valid equation and correctly solve it to receive full credit. Providing the equation for the student to solve does not meet this criterion. Additionally, the equation does not have the format indicated in the Evidence Statement. Changing $x - 0.75 = 0.5$ to the required form, $x + (-0.75) = 0.5$, creates a situation in which one of the values is a negative number. The Evidence Statement indicates that only positive values can be used in the equation. The intent of the standard associated with this Evidence Statement is to introduce only two types of one-step

equations – one that can be solved by subtraction and the other solved by division. Therefore, this task would not be a PARCC-like task.

Links to each set of Evidence Statements are provided below. Additional guidance and training on how to use the Evidence Statements will be available throughout Spring and Summer 2014.

Grade 6 PBA Evidence Statements	Grade 6 EOY Evidence Statements
Grade 7 PBA Evidence Statements	Grade 7 EOY Evidence Statements
Grade 8 PBA Evidence Statements	Grade 8 EOY Evidence Statements

VII. PARCC Policies Affecting Test Administration

Testing Format and Administration for Mathematics Summative Assessments

At the end of school year 2014-15, students in grades 6, 7, and 8 will take PARCC assessments **on computers**. Local education agencies (LEAs) can apply for a waiver to administer the assessment in paper and pencil form for one year, if technology systems are not ready for the 2014-15 administration.

The table that follows provides a breakdown of the testing sessions by grade level, including an estimate of the amount of time the typical student will need to complete each session. These estimates may be refined based on the results of the field tests and are summarized from PARCC's [Assessment Administration Guidance](#).

Component	Format and Administration
Performance-Based Assessment (PBA) Hand- and Computer- Scored Items	Format Approximately 75% of the way through the school year 2 mathematics sessions (50 minutes/session) Administration 20 day testing window for Computer Based Tests (CBT): March 2-27, 2015 5 day testing window for Paper Based Tests (PBT): March 16-20, 2015
End-of-Year Assessment (EOY) Computer-Scored Items Only	Format Approximately 90% of the way through the school year 2 mathematics sessions (55 minutes/session) Administration 20 day testing window for Computer Based Tests (CBT): April 27-May 22, 2015 5 day testing window for Paper Based Tests (PBT): May 4-8, 2015

For 2015 only, results will not be available until early Fall. Therefore, no summer retests will be offered for Summer 2015.

While it is anticipated that most students will complete the test sessions within these estimated times, all participating students will have a set amount of additional time for each session to provide them with ample time to demonstrate their knowledge. Students with disabilities who have a documented (e.g., IEP) extended time accommodation will be given time beyond the set additional time.

Calculators

PARCC mathematics assessments in grades 6-8 are to be divided into calculator and non-calculator sessions. With the exception of students who have a documented (e.g., IEP) assistive technology accommodation,

- students in grades 6 and 7 are permitted to use *a four-function calculator with square root and percent keys.*
- students in Grade 8 are permitted to use *a scientific calculator.*

Online calculators of the types indicated above will be available during the administration of the calculator session for each mathematics test. PARCC's complete calculator policy is located at

<http://www.parcconline.org/sites/parcc/files/PARCCApprovedCalculatorPolicy-July%202012.pdf>

Reference Sheets

Students in grades 6, 7, and 8 will be provided a reference sheet available at

http://www.parcconline.org/sites/parcc/files/ApprovedPARCCReferenceSheet_081712.pdf. A copy of each reference sheet is provided below.

<u>Grade 6</u>		
1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5,280 feet	1 pound = 0.454 kilograms	1 quart = 2 pints
1 mile = 1,760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2,000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallons
		1 liter = 1000 cubic centimeters
Triangle	$A = \frac{1}{2}bh$	
Right Rectangular Prism	$V = Bh$ or $V = lwh$	

<u>Grade 7</u>		
1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5,280 feet	1 pound = 0.454 kilograms	1 quart = 2 pints
1 mile = 1,760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2,000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallons
		1 liter = 1000 cubic centimeters
Triangle	$A = \frac{1}{2}bh$	
Parallelogram	$A = bh$	
Circle	$A = \pi r^2$	
Circle	$C = \pi d$ or $C = 2\pi r$	
General Prisms	$V = Bh$	

Grade 8

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5,280 feet	1 pound = 0.454 kilograms	1 quart = 2 pints
1 mile = 1,760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2,000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallons
		1 liter = 1000 cubic centimeters

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pythagorean Theorem	$a^2 + b^2 = c^2$

Other Permitted Testing Materials

Students will be permitted to have school-issued scratch paper. All scratch paper is to be collected by the test administrator at the conclusion of testing each day. The test administration manuals will provide more specific information needed to administer the assessments.

VIII. Student Technology Skills

Students taking the PARCC online assessments have an opportunity to practice using the computer tools provided in PARCC’s online testing system. These tools include both the enhanced-technology and accessibility features available to all students. PARCC has developed a Tutorial and Sample Tasks for the purpose of learning how to use these tools. Both are accessible <http://practice.parcc.testnav.com/#>.

The computer operating system and web browser requirements for viewing the online Tutorial and Sample Tasks are the same as those for the general online testing system. For a complete set list of supported systems, see http://www.pearsononlinetesting.com/TestNav/8/requirements_testnav_8_0_4.html. Check with your district technology coordinator for questions regarding equipment compatibility issues.

Technology Enhancements in Online Assessments

Both the Performance-Based and End-of Year online assessments will have computer-scored Type I tasks. Students will use computer-based enhancements such as:

- select (multiple choice)
- multiple select
- inline choices (drop down menus)
- drag-and-drop
- fill-in-the-blank
- hotspots

- combination equation builder and text editor

The following examples are screenshots of computer-based enhancements taken from online samples provided by PARCC.

Select (multiple choice): Students choose only one correct answer. The multiple select format is similar, but allows for choosing more than one correct answer.

What does $18 + 22$ equal?

A. 40

B. 18

C. 0

D. 52

Inline Choice (drop down menus): Students select correct responses from a drop-down menu to complete mathematical or verbal statements.

Kelvin ran a 100-meter race at an average speed of v meters per second. He completed the race in 12.5 seconds.

Part A

Use the drop-down menus to complete an equation that can be used to find v .

Choose... = Choose... Choose... v

Drag-and-drop: Students select and move information to provide correct responses.

Baseball stadiums have different numbers of seats. Drag the tiles to arrange the stadiums from least to greatest number of seats.

San Francisco Giants' stadium: 41,915 seats	Washington Nationals' stadium: 41,888 seats	San Diego Padres' stadium: 42,445 seats
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Fill-in-the-blank: Students provide a short, usually numeric, response in a provided box.

Patricia needs to read for 120 minutes each week.

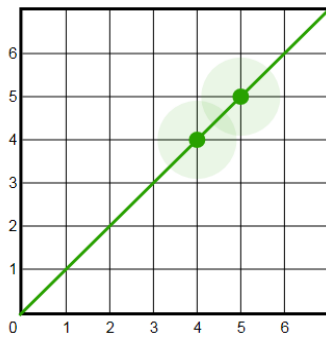
- She read for 26 minutes on Monday.
- She read for 39 minutes on Tuesday.
- She read for 38 minutes on Thursday.

How many more minutes does Patricia need to read this week?

Enter your answer in the box.

 minutes

Hotspots: Students provide correct responses by selecting an object such as a point on a number line, squares to show an array, or a point on a coordinate plane.



Grades 6-8 Equation and Text Editor: Students use this tool in conjunction with the keyboard to provide detailed explanations or to show problem-solving methods used in Type II and Type III tasks. This tool will also be used in Type I tasks when entering fractions and mixed number responses.

Mr. Ruiz has 210 students who are interested in joining the marching band. He decides to have 80% of the band be made up of percussion and brass instruments. Use the unit rate you found in Part A to determine how many students should play brass instruments.

Show or explain all your steps.

Calculator interface showing a toolbar with mathematical symbols (undo, redo, copy, paste, plus, minus, multiply, divide, fraction, square root, power, square root, equals, approximate) and a list of categories on the right: Numbers, Arithmetic and Units, Exponents and Roots, Relations, Geometry, and Groups.

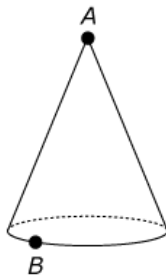
IX. Grade-Level Examples of PARCC Tasks

On the next few pages are Sample Tasks released by PARCC and designed to help educators understand each task type. At least one sample of each task type is provided from the grade span 6-8. The samples presented in this document can be found on the online testing system. The original pdf versions of these and other Sample Tasks, along with annotations and rubrics, are available from <http://www.parcconline.org/samples/math>.

PARCC has released an online Tutorial and Sample Tasks. Both the tutorial and the digital versions of some of the Sample Tasks shown below are available at <http://practice.parcctestnav.com/#>. Technology requirements for using the online testing system can be found at http://www.pearsononlinetesting.com/TestNav/8/requirements_testnav_8_0_4.html.

Grade 8 - Type I – 1 point

A right circular cone is shown in the figure. Point A is the vertex of the cone and point B lies on the circumference of the base of the cone.



The cone has a height of 24 units and a diameter of 20 units. What is the distance from point A to point B ? Enter your answer in the box.

 units

<p>Evidence Statement</p>	<p>8.G.7-2: Apply the Pythagorean Theorem in a simple three-dimensional cases</p> <p>Clarifications:</p> <ul style="list-style-type: none"> i) Tasks have “thin context” or no context. ii) Tasks require students to find one side of a right triangle in three dimensions, given information on a diagram that straight forwardly determines the other two sides. iii) In 50% of tasks, the answer is a whole number and is to be given as a whole number. iv) In 50% of tasks, the answer is irrational and is to be given approximately to three decimal places. <p>The testing interface can provide students with a calculation aid of the specified kind for these tasks.</p> <p>This standard is major content in the grade based on the PARCC Model Content Frameworks.</p>
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Most Relevant Standards for Mathematical

8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

Students use the Pythagorean Theorem strategically to solve this application problem (MP.5) and reason quantitatively (MP.2) based on the mathematical situation.

This application task illustrates how the Pythagorean Theorem can be used to solve mathematical problems in three dimensions. Students must analyze the situation and use the Pythagorean Theorem as a tool to find a solution to the problem. These tasks will reflect a balance of whole number and irrational answers to attend to the rigor expected at Grade 8.

Using a fill-in-the-blank response allows for quick scoring of student responses while reducing the chance that students guess correctly or get a hint from answer choices to use the Pythagorean Theorem.

The correct response is 26.

This task can be accessed in pdf format at

http://www.parcconline.org/sites/parcc/files/PARCC_SampleItems_Mathematics_G8LengthofSegment_081513_Final.pdf

Grade 7 – Type I – 2 points

On Friday, three friends shared how much they read during the week.

- Barbara read the first 100 pages from a 320-page book in the last 4 days.
- Colleen read the first 54 pages from a 260-page book in the last 3 days.
- Nancy read the first 160 pages from a 480-page book in the last 5 days.

Part A

A person's average reading rate can be defined as the number of pages read divided by the number of days. Place the three friends' reading rates in order from greatest to least by clicking on the names and dragging them into the correct order.

Greatest Rate (pages per day)

Barbara

Colleen

Nancy

Least Rate (pages per day)

Part B

If the three friends continue to read every day at their rates, who will finish reading her book first? Second? Third?

Order the friends from the first one who is predicted to finish her book to the third one who is predicted to finish her book. Click on the names and drag them into the correct order.

First

Barbara

Colleen

Nancy

Third

Evidence Statement	7.RP.3-1: Use proportional relationships to solve multi-step ratio problems.
Most Relevant Standards for Mathematical Content	<p>7.RP.3: Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i></p> <p>This standard is major content in the grade based on the PARCC Model Content Frameworks.</p>
<p>This two-point task has some features of Modeling (MP.4) because a mathematical quantity (pages per day) is being defined to capture a real-world notion, “reading rate,” that does not have a mathematical definition already associated with it.</p> <p>The task engages students in the important procedural skills of calculating and comparing unit rates. Students use contextual information to order the unit rates from greatest to least and then use those rates to solve an application problem. Using ratios to solve problems is a critical skill for Grade 7 students. It builds on their earlier work with ratios in Grade 6 to set the stage for important Grade 8 work with functions.</p> <p>The use of technology in this task makes it difficult to guess the correct answer or use a choice-elimination strategy. A calculation aid will be available.</p> <p>This task can be accessed in pdf format at http://www.parcconline.org/sites/parcc/files/PARCC_SampleItems_Mathematics_G7ReadingBooks_081913_Final.pdf.</p>	

Scoring Information

Task is worth 2 points. Task can be scored as 0, 1, or 2.

Part A: This part is worth 1 point.

Nancy ($160/5 = 32$ pages per day)

Barbara ($100/4 = 25$ pages per day)

Colleen ($54/3 = 18$ pages per day)

Part B: The part is worth 1 point.

Barbara ($(320 - 100)/25 = 8.8$ days)

Nancy ($(480 - 160)/32 = 10.0$ days)

Colleen ($(260 - 54)/18 = 11.4$ days)

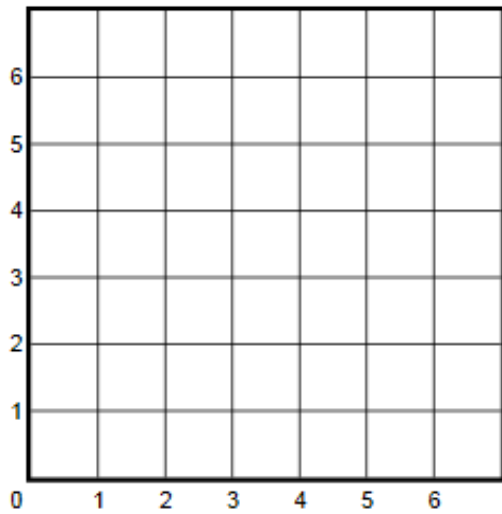
Grade 7 – Type II – 3 points

Part A

Each box below identifies a line containing a pair of points. Indicate whether each line represents a proportional relationship between x and y by dragging the boxes to the appropriate location: Proportional Relationship or Not a Proportional Relationship.

Line 1 containing (1, 3) and (2, 3)	Line 2 containing (1, 2) and (2, 4)
Line 3 containing (3, 1) and (6, 2)	Line 4 containing (0, 2) and (5, 4)
Line 5 containing (4, 4) and (5, 5)	

Proportional Relationship	Not a Proportional Relationship
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Part B

For the lines in Part A that do not represent a proportional relationship, explain why they do not.

For each line in Part A that does not represent a proportional relationship, describe how you would change the coordinates of one of the two given points on the line to create a proportional relationship.



- ▶ Numbers
- ▶ Arithmetic and Units
- ▶ Exponents and Roots
- ▶ Relations
- ▶ Geometry
- ▶ Groups

Evidence Statement	<p>7.C.4: Base explanations/reasoning on a coordinate plane diagram (whether provided in the prompt or constructed by the student in her response).</p> <p>Content Scope: Knowledge and skills articulated in 7.RP.A. For this task, the scope is 7.RP.2a.</p>
Most Relevant Standards for Mathematical Content	<p>7.RP.2a: Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>This standard is major content in the grade based on the PARCC Model Content Frameworks.</p>

MP.3 and MP.6 are prominent as students are asked to explain how to make the non-proportional relationships into proportional relationships. The rubric requires students to use precise language to receive full credit for Part B. Students who use the grid to graph the points (MP.5) may look for structure (MP.7) to expedite the analysis of the five lines).

This conceptual understanding task illustrates how students can test for equivalent ratios using a graphing tool and explain their reasoning with precision required at Grade 7. Students first show that they understand proportional relationships by deciding whether five lines are proportional. Then, students confirm their understanding by explaining how the two lines that represent non-proportional relationships could be changed to become proportional relationships. There are an infinite number of possible points that could satisfy this requirement and students must justify their new points using correct mathematical descriptions.

This task can be accessed in pdf format at

http://www.parcconline.org/sites/parcc/files/PARCC_SampleItems_Mathematics_G7ProportionalRelationships_081913_Final.pdf.

Rubric and Information for Sample Response

Task is worth 3 points. Task can be scored as 0, 1, 2, or 3.

Part A: This part is machine-scored and worth 1 point for a correct indication of whether each line represents a proportional relationship or not. Check marks in each column indicate the box into which the information is to be dropped.

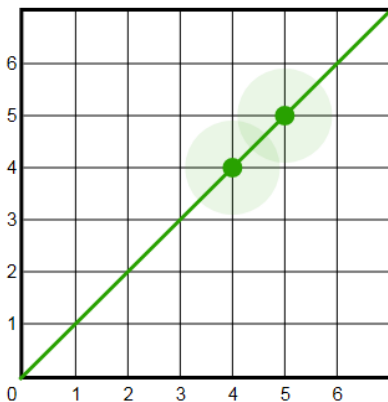
Line	Proportional Relationship	Not a Proportional Relationship
Line 1 containing (1, 3) and (2, 3)		✓
Line 2 containing (1, 2) and (2, 4)	✓	
Line 3 containing (3, 1) and (6, 2)	✓	
Line 4 containing (0, 2) and (5, 4)		✓
Line 5 containing (4, 4) and (5, 5)	✓	

Part B: This part is worth 2 reasoning points.

Reasoning point 1: The student indicates that lines 1 and 4 do not represent a proportional relationship because in both lines, the x and y values of the two given points are in different ratios. Or, the student provides another valid response, such as, the lines do not contain the origin.

Reasoning point 2: For line 1 to become a proportional relationship, either the second point can be changed so that its y -coordinate is 3 times its x -coordinate (NOTE: Solutions include, but are not limited to: (0, 0); (2, 6); (3, 9); and (1, 1.5)) OR the first point can be changed so that its y -coordinate is $\frac{3}{2}$ of its x -coordinate (NOTE: Solutions include, but are not limited to: (0, 0); (4, 6); (6, 9); and (1, 1.5)).

While a graphing tool is provided, work done using the tool is not scored. It is provided as a way to expedite the analysis process. The graph of line 5 is drawn below to exemplify the use of the graphing tool.



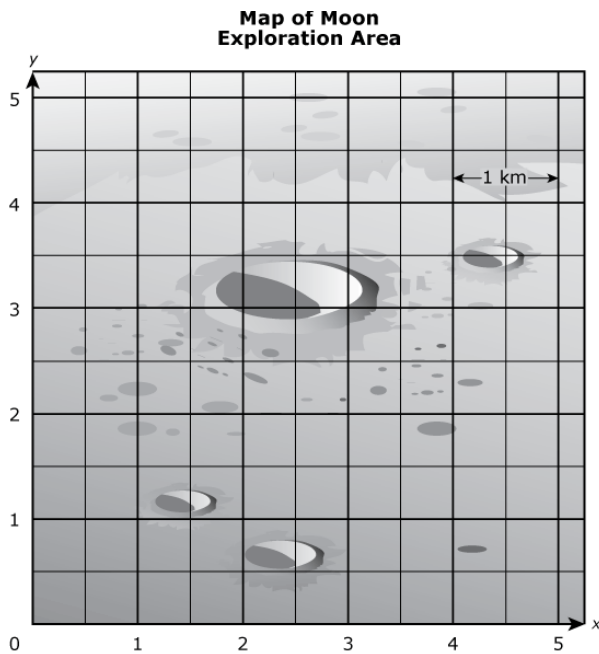
Grade 6 – Type III – 6 points

Scientists are sending a rover to the moon. Their plan is to study a rectangular area of the moon using the map shown. On the grid, 1 unit represents 1 kilometer (km).

Part A

The rover will land at (3.5, 1), explore up to (3.5, 4), and then over to (2, 4).

Plot these three points on the map.



Part B

What are the coordinates of the fourth vertex of the rectangle that the scientists plan to explore?

Enter your answer in the box.

(,)

Part C

What is the horizontal length of the rectangle? Enter your answer in the box. kilometers

What is the vertical length of the rectangle? Enter your answer in the box. kilometers

Part D

Find the area of the moon exploration area in square **meters**. Show your work.



- ▶ Numbers
- ▶ Arithmetic and Units
- ▶ Exponents and Roots
- ▶ Relations
- ▶ Geometry
- ▶ Groups

Evidence Statement	<p>6.D.2: Solve multi-step contextual problems with degree of difficulty appropriate to Grade 6, requiring application of knowledge and skills articulated in 5.NBT.B, 5.NF, 5.MD and 5.G.A.</p> <p>Clarification: Tasks may have scaffolding if necessary in order to yield a degree of difficulty appropriate to Grade 6.</p>
Most Relevant Standards for Mathematical Content	<p>5.NF.4b: Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</p> <p>5.MD.1: Convert among different---sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi---step, real world problems.</p> <p>5.G.1: Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation</p>
<p>Students use the technology to create a model of the moon exploration area (MP.4). This model requires significant interpretation requiring student to reason abstractly and quantitatively (MP.2). Explanation will require precise use of language and differentiation of meaning of the sections in the model.</p> <p>Students must closely analyze to see that the map scale is 0.5 km, not 1 km, to plot points and find lengths. Students must also realize that conversion is required to find the area in square km (either by converting the side lengths before multiplying or by converting square meters to square kilometers).</p>	

This is an example of a task assessing securely held content from grade 5; however, the plotting of points whose coordinates are decimals represent the rigor expected in grade 6. Additionally, the calculations resulting in an area of millions of square meters reflect the fluency with numbers appropriate for grade 6 students. Unlike traditional multiple choice, it is difficult to guess the correct answer or use a choice elimination strategy in this task.

This task may be accessed in pdf format at

<http://www.parcconline.org/sites/parcc/files/FractionModelFINAL.pdf>

Rubric

Task is worth 6 points. Task can be scored as 0, 1, 2, 3, 4, 5, or 6. Scoring consists of 4 points for modeling and 2 points for computation.

Part A, machine - scored

1 modeling point for creating a model with three correctly plotted points.

Part B, machine - scored

1 modeling point for writing the point of the fourth coordinate point.

Part C, machine scored

1 computational point for finding that the horizontal length is 1.5 kilometers.

1 computational point for finding that the vertical length is 3 kilometers.

Part D, hand scored

1 modeling point for creating a solution path that addresses unit conversion.

1 modeling point for creating a solution path to determine the area in square meters

Sample Response

Part A. Student plots points at (2, 4), (3.5, 4) and 3.5, 1).

Part B. (2, 1)

Part C. 1.5 kilometers and 3 kilometers

Part D. I converted 3 kilometers to 3,000 meters and 1.5 kilometers to 1,500 meters. Then, I multiplied 3,000 by 1,500 to find that the moon exploration area is 4,500,000 square meters. OR, Student can show steps used to solve the problem.

X. Glossary

Claim: A statement about student performance based on how students respond to test questions. PARCC tests are designed to elicit evidence from students that support valid and reliable claims about the extent to which they are college and career ready or on track toward that goal and are making expected academic gains based on the Common Core State Standards. To support such claims, PARCC assessments are designed to measure and report results in multiple categories called master claims and sub-claims.

End of Year Assessment (EOY): End-of-year assessments are administered after approximately 90 percent of the school year. The ELA/literacy End-of-Year Assessment will focus on reading comprehension. The mathematics EOY will ask students to demonstrate solid understanding of mathematics concepts and demonstrate mathematical fluency.

Evidence Statement: Words or phrases that describe student work and support claims about students' mastery of particular standards. Evidence statements describe what one can point to in a student's work to show that the student has mastered a specific standard.

Local Education Agency (LEA) – An LEA is an agency or other organization responsible for administrative control or direction of a school.

Partnership for Assessment of Readiness for College and Careers (PARCC): PARCC is a consortium of 18 states working together to develop an testing system for English language arts and mathematics anchored in what it takes to be ready for college and careers.

Performance-Based Assessment (PBA): For PARCC, the performance-based assessment will be administered approximately 75 percent of the way through the academic study of the grade or course content. Student results on the Performance-Based Assessment will be combined with their results on End-of-Year Assessment to produce overall PARCC scores in each content area. PBAs in mathematics will focus on reasoning and modeling and include questions that require both short and extended responses.

Standards for Mathematical Practice: The Standards for Mathematical Practice describe ways in which students ought to engage with mathematics through elementary, middle and high school. Examples of these practices include problem solving, procedural fluency and conceptual understanding.

Standard Setting: The process used to establish performance (achievement) level cut scores.

Summative Assessment: A summative assessment is designed to measure a student's knowledge and skills at the end of an instructional period, such as an entire school year or at the conclusion of a course. The PARCC summative assessment will include two components — the Performance-Based Assessment (PBA) component and the End-of-Year Assessment (EOY) component. The results of the two components will be combined to produce overall summative assessment results.

Task: In mathematics, a task is an operational item that may either have a single prompt or multiple prompts. The PARCC mathematics tests contain three types of tasks:

Type I tasks assess concepts, skills and procedures.

Type II tasks assess students' ability to express mathematical reasoning.

Type III tasks assess modeling and applications.

Technology-Enhanced Items (TEIs): TEIs are tasks administered on a computer and take advantage of the computer-based environment to present situations and capture responses in ways that are not possible on a paper-based test.