PARCC ASSESSMENTS
FOR GRADES 3-5
MATHEMATICS
Topics covered

- Overview of PARCC and development of items
- Claims Structure
- Evidence Statements
- Task Types and Test Blueprints
- Test Administration
- Sample Items, Student Technology Skills, Scoring
- Calculator and Tools policy
- Other PARCC Information
- Glossary
- Resources
- Contacts
• Governing States in PARCC – IL, MD, NJ, NM, and DC.

• All governing states are involved in all aspects of the item development and assessment process.

• Pearson, New Meridian, MOWGs (Mathematics Operational Working Group), SEs (State Educators)
PARCC Assessment Priorities

1. Determine whether students are college- and career-ready or on track
2. Compare performance across states and internationally
3. Assess the full range of the New Jersey Student Learning Standards (NJSLS), including standards that are difficult to measure
4. Measure the full range of student performance, including the performance of high and low performing students
5. Provide data for accountability, including measures of growth
6. Incorporate innovative approaches throughout the system
Life Cycle of a Test Item

Start with Standards

Review
Local teachers, principals, curriculum coordinators, state content experts & higher ed faculty ensure that items are:
- Aligned to the standards
- Accurate
- Free from bias
- Developmentally appropriate

Field Test the Items

Build the Test with selected items

Administer the Test

Reuse Remaining Items

Release a Portion of the Items

PARCC state educators and experts are highly selective!

Classroom teachers and other local educators are involved at every step, including test design. More than 30 educators and other experts review each item. The process of developing test questions is unprecedented for its level of rigor and inclusiveness.

At any point during the process, items may be sent back for revision or eliminated altogether if they do not meet the states’ quality criteria.
Evidence-Centered Design (ECD) for the PARCC Assessments

ECD is a deliberate and systematic approach to assessment development that will help to **establish the validity** of the assessments, **increase the comparability** of year-to-year results, and **increase efficiencies/reduce costs**.
Claims Structure:
Mathematics Grades 3 - 5

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 Content\(^1\) with Connections to Practices
The student solves problems involving the Major Content\(^1\) for her grade/course with connections to the Standards for Mathematical Practice.

Grade 3: 30 points
Grade 4: 31 points
Grade 5: 30 points

Sub-Claim B: Additional & Supporting Content\(^2\) with Connections to Practices
The student solves problems involving the Additional and Supporting Content\(^2\) for her grade/course with connections to the Standards for Mathematical Practice.

Grade 3: 10 points
Grade 4: 9 points
Grade 5: 10 points

Sub-Claim C: Highlighted Practices MP.3,6 with Connections to Content\(^3\) (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.

Total Exam Score Points:
Grades 3-5: 66

Grades 3-5: 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).

Grades 3-5: 12 points

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\(^1\) For the purposes of the PARCC Mathematics assessments, the Major Content in a grade/course is determined by that grade level’s Major Clusters as identified in the PARCC Model Content Frameworks v.3.0 for Mathematics. Note that tasks on PARCC assessments providing evidence for this claim will sometimes require the student to apply the knowledge, skills, and understandings from across several Major Clusters.

\(^2\) The Additional and Supporting Content in a grade/course is determined by that grade level’s Additional and Supporting Clusters as identified in the PARCC Model Content Frameworks v.3.0 for Mathematics.

\(^3\) For Grades 3 – 8, Sub-Claim C includes only Major Content.
Evidence Statements

To assist teachers in understanding how the mathematical content and mathematical practice standards will be assessed, PARCC has released Evidence Statements for each grade.

Evidence Statements are descriptions of student work 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 (such as limitations on numbers or whether the task is to be a word problem) to ensure consistency across tasks written for the same Evidence Statement.
Evidence Statement Tables: Types of Evidence Statements

Several types of evidence statements are being used to describe what a task should be assessing, including:

1. Those using **exact standards language**

2. Those transparently **derived from exact standards language**, e.g., by splitting a content standard

3. **Integrative evidence statements** indicate proficiencies that align to more than one standard and reinforce coherence reflected in the standards.

4. **Sub-claim C evidence statements** puts MP.3 and MP.6 (Reasoning) as primary with connections to content

5. **Sub-claim D evidence statements** which put MP.4 (Modeling) as primary with connections to content
1. **Those using exact standards language**

### Evidence Statement using Exact Standards Language

<table>
<thead>
<tr>
<th>Evidence Statement Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to Mathematical Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.OA.1</td>
<td>Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. <em>For example, describe a context in which a total number of objects can be expressed as $5 \times 7$.</em></td>
<td>i) Tasks involve interpreting rather than calculating products in terms of equal groups, arrays, area, and/or measurement quantities. (See CCSSM, Table 2, Common multiplication and division situations, p. 89.) For example, “the total number of books if 5 shelves each have 7 books” can be represented by the expression $5 \times 7$ rather than “Marcie placed 7 books on each of 5 shelves. How many books does she have?” ii) Tasks do not require students to interpret products in terms of repeated addition, skip-counting, or jumps on the number line. iii) The italicized example refers to describing a real-world context, but describing a context is not the only way to meet the standard. For example, another way to meet the standard would be to identify contexts in which a total can be expressed as a specified product.</td>
<td>MP.2, MP.4</td>
</tr>
</tbody>
</table>

Where the ES connects to the NJSLS. Tasks will assess 3.OA.1
Evidence Statements Derived from Exact Standards

2. Those transparently derived from exact standards language, e.g., by splitting a content standard.

<table>
<thead>
<tr>
<th>Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.NF.4b-1</td>
<td>Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. b. Understand a multiple of a/b as a multiple of 1/b. For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5).</td>
<td>i) Tasks do not have a context. ii) Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy. iii) Tasks involve expressing a/b as a multiple of 1/b. iv) Results may equal fractions greater than 1 (including fractions equal to whole numbers). v) Whole number results are limited to 0 through 5. vi) Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.</td>
<td>MP.5, MP.7</td>
</tr>
<tr>
<td>4.NF.4b-2</td>
<td>Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. b. Use the understanding that a multiple of a/b is a multiple of 1/b to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 x (2/5) as 6/5. (In general, n x (a/b) = (n x a)/b.)</td>
<td>i) Tasks do not have a context. ii) Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy. iii) Tasks involve expressing a/b as a multiple of 1/b. iv) Results may equal fractions greater than 1 (including fractions equal to whole numbers). v) Whole number results are limited to 0 through 5. vi) Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.</td>
<td>MP.5, MP.7</td>
</tr>
</tbody>
</table>
3. **Integrative evidence statements** indicate proficiencies that align to more than one standard and reinforce coherence reflected in the NJSLS.

An Evidence Statement could be integrated across

- **Grade/Course** – Ex. 4.Int.2 (Integrated across Grade 4)
- **Domain** – 4.NF.Int.1 (Integrated across the Numbers and Operations - Fractions Domain)
- **Cluster** – 5.NFA.Int.1 (Integrated across the grade 5 Numbers and Operations – Fractions Domain, articulated in Cluster A (5.NF.1 and 5.NF.2 )

The extension numbers “.1, .2, 3-3” on all “Int” Evidence Statements are used for numbering/ordering purposes.
Grade/Course – Ex. 4.Int.1 (Integrated across Grade 4)

<table>
<thead>
<tr>
<th>Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to MP</th>
</tr>
</thead>
</table>
| 4.Int.2 | Solve one-step word problems involving multiplying two two-digit numbers. | i) The given numbers are such as to require a general strategy based on place value and the properties of operations (e.g., $63 \times 44$).
 ii) Word problems shall include a variety of grade-level appropriate applications and contexts. | MP.1, MP.7 |

Draws on content from **ALL of Grade 4**
### Integrative Evidence Statements

**Domain** – Ex. 4.NF.Int.1 (Integrated across the Numbers and Operations - Fractions Domain)

<table>
<thead>
<tr>
<th>Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.NF.Int.1</td>
<td>Solve one-step word problems requiring integration of knowledge and skills articulated in 4.NF.</td>
<td>i) Tasks are limited to denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.</td>
<td>MP.1, MP.4</td>
</tr>
</tbody>
</table>

- **Content Scope:** 4.NF

- **Draws on content from ALL of NF in Grade 4**
## Integrative Evidence Statements

**Cluster** – 5.NF.A.Int.1 (Integrated across the grade 5 Numbers and Operations – Fractions Domain, articulated in Cluster A (5.NF.1 and 5.NF.2 )

<table>
<thead>
<tr>
<th>Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.NF.A.Int.1</td>
<td>Solve word problems involving knowledge and skills articulated in 5.N.F.A.</td>
<td>i) Prompts do not provide visual fraction models; students may at their discretion draw visual fraction models as a strategy.</td>
<td>MP.1, MP.4, MP.5</td>
</tr>
</tbody>
</table>

Draws on content from **ALL of Cluster A in the Fractions Domain of Grade 5**
4. **Sub-claim C** puts MP.3 and MP.6 (Reasoning) as primary with connections to content.

<table>
<thead>
<tr>
<th>Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.C.8-2</td>
<td>Present solutions to multi-step problems in the form of valid chains of reasoning, using symbols such as equals signs appropriately (for example, rubrics award less than full credit for the presence of nonsense statements such as 1 + 4 = 5 + 7 = 12, even if the final answer is correct), or identify or describe errors in solutions to multi-step problems and present corrected solutions. Content Scope: Knowledge and skills articulated in 5.MD.5c</td>
<td>i) Multi step problems must have at least 3 steps</td>
<td>MP.3, MP.5, MP.6</td>
</tr>
</tbody>
</table>
Sub-claim D Evidence Statements

5. Sub-claim D Evidence Statements puts MP.4 (Modeling) as primary with connections to content.

<table>
<thead>
<tr>
<th>Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks</th>
<th>Relationship to MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.D.1</td>
<td>Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in this PBA Table excluding those standards listed in Evidence Statements for Subclaim C (i.e., 5.C.1-1 through 5.C.8-2)</td>
<td>i) Tasks may have scaffolding*. ii) Multi-step problems must have at least 3 steps.</td>
<td>MP.4</td>
</tr>
<tr>
<td>5.D.2</td>
<td>Solve multi-step contextual problems with degree of difficulty appropriate to Grade 5, requiring application of knowledge and skills articulated in 4.OA, 4.NBT, 4.NF, 4.MD.</td>
<td>i) Tasks may have scaffolding if necessary in order yield a degree of difficulty appropriate to Grade 5. ii) Multi step problems must have at least 3 steps.</td>
<td>MP.4</td>
</tr>
</tbody>
</table>

*Scaffolding in a task provides the student with an entry point into a pathway for solving a problem. In unscaffolded tasks, the student determines his/her own pathway and process. Both scaffolded and unscaffolded tasks will be included in reasoning and modeling items.
Using an 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 3.OA.4 which is provided below the task.

Johnny has 8 crayons. He wants to give an equal number of crayons to each of his 4 friends. He wrote the equation $4 \times ? = 8$ to find the number of crayons he should give to each friend. How many crayons should Johnny give to each friend?

**Based on the information in Evidence Statement 3.OA.4, would this be considered a PARCC-like task?**

<table>
<thead>
<tr>
<th>Evidence Statement Key</th>
<th>Evidence Statement Text</th>
<th>Clarifications</th>
<th>Math Practice(s)</th>
</tr>
</thead>
</table>
| 3.OA.4                 | Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $7 = w \div 3$, $6 \times 6 = ?$. | i) Tasks do not have a context.  
ii) Only the answer is required (methods, representations, etc. are not assessed here).  
iii) All products and related quotients are from the harder three quadrants of the times table ($a \times b$ where $a > 5$ and/or $b > 5$). | - |
The answer is “no.” Clarification (i) indicates that problems with context are not to be used when writing tasks for Evidence Statement 3.OA.4. Since this is a real-life application presented in the form of a word problem, the task does not meet this clarification. The task should be simple and straightforward, such as “Find the missing number: 4 x ? = 8.” Additionally, the task does not meet the content limits of clarification (iii) as 4 and 2 are both less than 5.

Evidence Statements for each grade is provided in the PARCC Informational Guides using the following link.
Overview of Task Types

- The PARCC assessments for mathematics will involve three primary types of tasks: Type I, II, and III.
- Each task type is described on the basis of several factors, principally the purpose of the task in generating evidence for certain sub claims.
# Overview of PARCC Mathematics Task Types

<table>
<thead>
<tr>
<th>Task Type</th>
<th>Description of Task Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. Tasks assessing concepts, skills and procedures</strong></td>
<td>• Balance of conceptual understanding, fluency, and application</td>
</tr>
<tr>
<td></td>
<td>• Can involve any or all mathematical practice standards</td>
</tr>
<tr>
<td></td>
<td>• Machine scorable including innovative, computer-based formats</td>
</tr>
<tr>
<td></td>
<td>• Sub-claims A and B</td>
</tr>
<tr>
<td><strong>II. Tasks assessing expressing mathematical reasoning</strong></td>
<td>• Each task calls for written arguments / justifications, critique of reasoning, or precision in mathematical statements (MP.3, 6).</td>
</tr>
<tr>
<td></td>
<td>• Can involve other mathematical practice standards</td>
</tr>
<tr>
<td></td>
<td>• May include a mix of machine scored and hand scored responses</td>
</tr>
<tr>
<td></td>
<td>• Sub-claim C</td>
</tr>
<tr>
<td><strong>III. Tasks assessing modeling / applications</strong></td>
<td>• Each task calls for modeling/application in a real-world context or scenario (MP.4)</td>
</tr>
<tr>
<td></td>
<td>• Can involve other mathematical practice standards</td>
</tr>
<tr>
<td></td>
<td>• May include a mix of machine scored and hand scored responses</td>
</tr>
<tr>
<td></td>
<td>• Sub-claim D</td>
</tr>
</tbody>
</table>
## PARCC BLUEPRINTS

<table>
<thead>
<tr>
<th>Items</th>
<th>Grade 3</th>
<th>Grade 4</th>
<th>Grade 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I 1 point</td>
<td>32</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Type I 2 point</td>
<td>4</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Type II 3 point</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type II 4 point</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type II 3 point</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type III 6 point</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Type III 3 point</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type III 6 point</td>
<td>36/40pts</td>
<td>33/40pts</td>
<td>33/40pts</td>
</tr>
<tr>
<td>Type II 4 point</td>
<td>4/14pts</td>
<td>4/14pts</td>
<td>4/14pts</td>
</tr>
<tr>
<td>Type III 3 point</td>
<td>3/12pts</td>
<td>3/12pts</td>
<td>3/12pts</td>
</tr>
<tr>
<td>Type III 6 point</td>
<td>43/66pts</td>
<td>40/66pts</td>
<td>40/66pts</td>
</tr>
</tbody>
</table>
Test Administration

The table that follows provides a breakdown of the testing units by grade level, including an estimate of the amount of time the typical student will need to complete each unit.

<table>
<thead>
<tr>
<th>Component</th>
<th>Format and Administration</th>
</tr>
</thead>
</table>
| Summative Assessment Hand- and Computer-Scored Items | **Format**  
Approximately 80% of the way through the school year  
4 mathematics units, 60 minutes/unit  
**Administration**  
30 day testing window |
PARCC RELEASED ITEMS & PRACTICE TESTS

- PARCC releases items every year.
- These are actual test items that appeared on the previous years’ tests.
- Each set of released items will have an answer key, detailing the ES assessed, as well as a rubric and sample student papers for Type II and Type III items.
- [http://parcc-assessment.org/released-items](http://parcc-assessment.org/released-items)
- PARCC also has a practice test for students to see the types of items and technology used to answer those items
- [https://parcc.pearson.com/practice-tests/math/](https://parcc.pearson.com/practice-tests/math/)
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 here: https://parcc.pearson.com/tutorial/

Technology-Enhanced Item Types in Online Assessments

The Summative Assessment 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
- equation editor only
NEW FOR 2018 and beyond

Grades 3-5 will have a drawing tool available on certain Type II/Type III items. It is NOT available for every constructed response item. It is available only on items where a student may use a drawing to help support his/her answer. Students are NOT required to use the drawing tool.

Students will have a tutorial on how to use the drawing tool prior to the administration of the test.

Responses that are within the drawing tool box will be scored.
Student Technology Skills

**Select (multiple choice):** Students choose only one correct answer.

The value of the digit 4 in the number 42,780 is 10 times the value of the digit 4 in which number?

- A. 34,651
- B. 146,703
- C. 426,135
- D. 510,400

**Multiple Select:** The multiple select is similar to multiple choice; however, students must choose the correct number of correct answers.

Which equations are true?
Select the **three** correct answers.

- A. $7 \div 7 = 0$
- B. $3 \times 4 = 12$
- C. $10 \div 5 = 5$
- D. $16 \div 2 = 8$
- E. $0 \times 6 = 0$
Inline Choice (drop down menus): Students select correct responses from a drop-down menu to complete mathematical or verbal statements.

Which symbol belongs in each fraction comparison?

Select from the drop-down menus to correctly complete each comparison.

\[
\begin{align*}
\frac{3}{4} & \quad \text{Choose...} & \frac{9}{10} \\
\frac{4}{12} & \quad \text{Choose...} & \frac{3}{4} \\
\frac{9}{10} & \quad \text{Choose...} & \frac{4}{12}
\end{align*}
\]
Student Technology Skills

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

Which fractions complete the number sentences shown to make true comparisons?
Complete each number sentence so that it is a true comparison.
Drag and drop a fraction into each box.

\[
\frac{2}{5} = \boxed{} \quad \frac{3}{5} < \boxed{}
\]

Fill-in-the-blank: Students provide a short, usually numeric, response in a provided box.


How many packs of light bulbs did Jane buy?

Enter your answer in the space provided.
**Student Technology Skills**

**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.

Where would a point be plotted to show $\frac{5}{3}$ on the number line?

Select the place on the number line to plot the point.
**Student Technology Skills**

**Grades 3-5 Equation Editor only:** This tool will also be used in Type I tasks when entering fractions and mixed number responses.

Diana works at a clothing store. She sold $\frac{1}{5}$ of the total number of green shirts on Monday and $\frac{3}{12}$ of the total number of green shirts on Tuesday.

What fraction of green shirts did Diana sell on Monday and Tuesday?

What fraction of green shirts did Diana not sell on Monday and Tuesday?

Enter your answers in the space provided. Enter **only** your answers.

**Fraction of green shirts sold Monday and Tuesday:**

**Fraction of green shirt not sold Monday and Tuesday:**
Student Technology Skills

**Grades 3-5 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.

Henry cut a piece of yarn that was \( \frac{11}{6} \) feet long into two pieces. List two different pairs of fractions that could show the lengths, in feet, of the two pieces. Explain how you found your pairs of fractions.

Enter your fraction pairs and your explanation in the space provided.
Mia placed point $P$ on the number line.

- Give the value of the number $P$ as a fraction.
- What does the denominator of your fraction represent on the number line?
- What does the numerator of your fraction represent on the number line?

Enter your answer and your explanation in the space provided.
## TYPE II ITEMS (Sub-claim C, Reasoning)

### 3.C.6-1/3.NF.2b

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3     | Student response includes each of the following 3 elements:  
|       | - Computation component: States that Point P represents 5/6  
|       | - Reasoning component: Correct explanation for what the denominator represents  
|       | - Reasoning component: Correct explanation for what the numerator represents  
|       | Sample Student Response:  
|       | Point P is at 5/6 on the number line. The denominator represents the total number of equal parts between 0 and 1. There are six equal segments between 0 and 1 so each segment is 1/6. The numerator represents the number of segments that the number is to the right of 0. So, if you count 5 segments of 1/6, you end up at 5/6. |
| 2     | Student response includes 2 of the 3 elements. |
| 1     | Student response includes 1 of the 3 elements. |
| 0     | Student response is incorrect or irrelevant |
TYPE II ITEMS (Sub-claim C, Reasoning)

Martin cut a pan of corn bread into equal pieces as shown in the model.

**Part A**

Martin gave $\frac{1}{3}$ of the corn bread to his neighbor.

Explain how you can use the model to show $\frac{1}{3}$. Then write a fraction that is equivalent to $\frac{1}{3}$.

Enter your explanation and your answer in the space provided.

**Part B**

Martin gave $\frac{6}{12}$ of the corn bread to his teacher.

Write a comparison using $<$, $>$, or $=$ to compare the fractions $\frac{1}{3}$ and $\frac{6}{12}$. Explain how the model can be used to compare these fractions.

Enter your comparison and your explanation in the space provided.
# TYPE II ITEMS (Sub-claim C, Reasoning)

## 4.C.4-1/4.NF.1

### Part A

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2     | Student response includes each of the following 2 elements:  
- Computation component: 4/12 or any equivalent fraction except 1/3  
- Reasoning component: Student explains how to use the model to represent the fraction, such as, “There are 3 rows, so 1/3 is one row. There are 4 pieces in each row and 12 pieces in all, so 4/12 would be equal to 1/3.”  
Note: A variety of explanations are valid, as long as it is clear that the student understands how to use the model to represent the fraction. |
| 1     | Student response includes 1 of the 2 elements. If a computation mistake is made, credit cannot be given for the computation component, but 1 point can be given for a correct explanation. |
| 0     | Student response is incorrect or irrelevant. |

### Part B

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2     | Student response includes each of the following 2 elements:  
- Reasoning component: 1/3 < 6/12 or 6/12 > 1/3  
- Reasoning component: Student explains how to use the model to compare the fractions, such as, “1/3 was 4 out of 12 pieces, and 6/12 is 6 out of 12 pieces. 4 pieces is less than 6 pieces, so 1/3 is less than 6/12.”  
Note: A variety of explanations are valid, as long as it is clear that the student understands how to use the model to compare the fractions. |
| 1     | Student response includes 1 of the 2 elements. |
| 0     | Student response is incorrect or irrelevant. |
TYPE II ITEMS (Sub-claim C, Reasoning)

Nick measured two crickets in science class. The lengths of the two crickets are shown.
- Cricket A: \( \frac{3}{8} \) inch
- Cricket B: \( \frac{5}{8} \) inch

The science teacher asked Nick to compare the length of each cricket to \( \frac{1}{2} \) inch.

**Part A**

Nick claims that the length of each cricket is greater than \( \frac{1}{2} \) because the numerator of each cricket length is greater than the numerator in \( \frac{1}{2} \).

Compare \( \frac{1}{2} \) inch to the length of each cricket using the \( >, <, \) or \( = \) symbol. Then explain whether Nick’s reasoning is correct.

Enter your comparisons and your explanation in the space provided.

**Part B**

Nick recorded the distance each cricket jumped.
- Distance for cricket A: \( 1 \frac{3}{4} \) feet
- Distance for cricket B: \( 3 \frac{3}{4} \) feet

Nick claims that cricket B jumped \( 2 \frac{1}{4} \) feet farther than cricket A because the difference between the whole numbers is 2 and the difference between the numerators is 1.

- Explain why Nick’s reasoning is incorrect.
- What is the correct difference, in feet, between the distance cricket A jumped and the distance cricket B jumped?

Enter your explanation and your answer in the space provided.
## TYPE II ITEMS (Sub-claim C, Reasoning)

### 5.C.7-4/4.NF.2

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2     | Student response includes each of the following 2 elements:  
  - Computation component: The student provides the inequalities “3/8 < 1/2” AND “5/8 > 1/2” OR other inequalities that are equivalent to these.  
  - Reasoning component: The student explains that Nick’s reasoning is not correct as he should have found a common denominator to compare 1/2 to 3/8 and 1/2 to 5/8. For example: "To compare the fractions, Nick should have changed 1/2 to 4/8.”  
Notes:  
  - A variety of explanations are valid. As long as it is clear that the student understands that only comparing the sizes of the numerators doesn’t work when the denominators are different, credit should be awarded.  
  - The student does not need to use the terms denominator or numerator as long as the explanation is clear as to which portion of the fraction the student is referencing. |
| 1     | Student response includes 1 of the 2 elements. Or, the student has an incorrect comparison(s), but provides a correct strategy. |
| 0     | Student response is incorrect or irrelevant. |
## TYPE II ITEMS (Sub-claim C, Reasoning)

### 5.C.7-4/4.NF.2

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2     | Student response includes each of the following 2 elements:  
   - Computation component: The student indicates that the difference between the distances jumped by the two crickets is $1 \frac{3}{4}$ feet.  
   - Reasoning component: The student explains why Nick’s reasoning is incorrect. For example, “Nick was supposed to subtract $1 \frac{3}{4}$ from $3 \frac{2}{4}$ which means he needed to change the numbers to $\frac{7}{4}$ and $\frac{14}{4}$ to be able to do that.  
     OR  
     The student explains that Nick could use the relationship between addition and subtraction, such as, "Since addition is the opposite of subtraction, he can count up from $1 \frac{3}{4}$ to get to $3 \frac{2}{4}$ by counting up by fourths.” |
| 1     | Student response includes 1 of the 2 elements. |
| 0     | Student response is incorrect or irrelevant. |
TYPE III ITEMS (Sub-claim D, Modeling)

Adam needs to put 19 pictures from Classroom A and 23 pictures from Classroom B on a bulletin board. He wants to display the pictures in an array.

Part A
Select a box for each picture to create an array to represent the pictures on the bulletin board.

Part B
Find the area of the array. Explain your answer using an equation or equations.

Enter your answer and your explanation using an equation or equations in the space provided.
## TYPE III ITEMS (Sub-claim D, Modeling)

### 3.D.1/3.OA.8

<table>
<thead>
<tr>
<th>Part A</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Modeling component: Student shades a 6 x 7 array.</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Student does not shade a 6 x 7 array.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part B</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Student response includes each of the following 2 elements.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Computation component: 42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Modeling component: Student writes an equation showing how to find the area of the array.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sample Student Response</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I shaded in an array of 6 x 7. I know 6 x 7 = 42, so the area of the array is 42.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Student response includes 1 of the 2 elements.</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>The student provides a valid equation showing the correct process for finding the area but makes a computational error, such as 6 x 7 = 48.</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Student response is incorrect or irrelevant.</td>
</tr>
</tbody>
</table>
Type III Items (Sub-claim D, Modeling)

Ms. Sloan asked 117 fourth-grade students the question, “How many pets do you have?” She displayed the data she collected in the bar graph shown.

**Part A**
How many of the students that responded have 2 pets?
Enter your answer in the box.

**Part B**
How many more students have 1 pet than students who have 3 pets? Explain your answer.
Enter your answer and explanation in the space provided.

**Part C**
Find the total number of pets the fourth-grade students have.
- Explain how you used the bar graph to solve the problem.
- Show your work using equations.
Enter your explanation, your work, and the total number of pets in the space provided.
### TYPE III ITEMS (Sub-claim D, Modeling)

**4.D.2/3.MD.3**

<table>
<thead>
<tr>
<th>Part A</th>
<th>Score</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Computation component: Student enters 20.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part B</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
|        | 2     | Student response includes each of the following 2 elements:  
|        |       | • Computation component: 5 students  
|        |       | • Modeling component: Student explains how to use the bar graph to determine how many more students have 1 pet than 3 pets.  
|        |       | Sample Student Response:  
|        |       | I looked at the height of the bar to find the number of students with one pet and saw it was 35. Then I looked at the height of the bar to find the number of students with 3 pets and saw it was 30. I subtracted 35 – 30 and got 5. So, there are 5 more students who have 1 pet than 3 pets.  
|        |       | Note: A variety of explanations are valid, as long as it is clear that the student understands how to use the bar graph to answer the question. |
|        | 1     | Student response includes 1 of the 2 elements. If a computation mistake is made, credit cannot be given for the computation component, but 1 point can be given for stating a correct process in the explanation. |
|        | 0     | Student response is incorrect or irrelevant. |
## TYPE III ITEMS (Sub-claim D, Modeling)

### 4.D.2/3.MD.3

<table>
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<th>Score</th>
<th>Description</th>
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</table>
| **3** | Student response includes each of the following 3 elements:  
  - Computation component: 201  
  - Modeling component: Student explains how to use the bar graph to solve the problem.  
  - Modeling component: Students shows work using equations.  
  Sample Student Response:  
    I read the height of each bar to know how many students had 1 pet, 2 pets, 3 pets, or 4 pets. I determined how many pets each bar shows by multiplying the number of students by the number of pets for each bar. Adding the numbers of pets for all the bars gives the total.  
    35 students have 1 pet  
    1 x 35 = 35 pets  
    20 students have 2 pets  
    2 x 20 = 40 pets  
    30 students have 3 pets  
    3 x 30 = 90 pets  
    9 students have 4 pets  
    4 x 9 = 36 pets  
    35 + 40 + 90 + 36 = 201 total pets  
  Note: A variety of explanations are valid as long as it is clear that the student understands how to use the bar graph to answer the question and shows work using equations. |
| **2** | Student response includes 2 of the 3 elements. If a computation mistake is made, credit cannot be given for the computation component, but points can be given for modeling. |
| **1** | Student response includes 1 of the 3 elements. |
| **0** | Student response is incorrect or irrelevant. |
TYPE III ITEMS (Sub-claim D, Modeling)

An egg farm packages 264 total cartons of eggs each month. The farm has 3 different sizes of cartons.
- The small carton holds 8 eggs, and \( \frac{1}{6} \) of the total cartons are small.
- The medium carton holds 12 eggs, and \( \frac{2}{3} \) of the total cartons are medium.
- The large carton holds 18 eggs, and the rest of the total cartons are large.

Determine how many of each size of carton is needed each month. Then determine how many eggs are needed to fill the 264 cartons. Show your work or explain your answers.

Enter your answers and your work or explanations in the space provided.
## TYPE III ITEMS (Sub-claim D, Modeling)

### 5.D.1/5.NF.4 and 5.NF.6

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<th>Score</th>
<th>Description</th>
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</table>
| 3     | Student response includes each of the following 3 elements:  
  • Computation: Number cartons: 44, 176, 44; 3256  
  • Modeling component: Correct work or explanation shown for determining the number of cartons of each size needed.  
  • Modeling component: Correct work or explanation shown for determining the total number of eggs needed to fill the 264 cartons.  
  Sample Student Response:  
  There are $264 \times \frac{1}{6} = 264/6 = 44$ cartons that hold 8 eggs. There are $264 \times \frac{2}{3} = 528/3 = 176$ cartons that hold 12 eggs. There are $264 - 44 - 176 = 44$ cartons that hold 18 eggs. The total number of eggs needed to fill all 264 cartons is $44 \times 8 + 176 \times 12 + 44 \times 18 = 3,256$ |
| 2     | Student response includes 2 of the 3 elements. Or, the student has a computation error, but provides a complete and valid explanation or process. |
| 1     | Student response includes 1 of the 3 elements. |
| 0     | Student response is incorrect or irrelevant. |
PARCC CALCULATOR POLICY

Allowable Calculators
- Grades 3-5: **No calculators allowed**, except for students with an approved calculator accommodation

Calculator Accommodations:
- 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. Test administrators are not required to collect calculators for items measuring fluency.

  - If a student needs a calculator as part of an accommodation in the non-calculator section, 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
PARCC MATHEMATICS TOOLS POLICY

- **Rulers/Protractors (required):**
  - Rulers are used on PARCC items at all grade levels.
  - Protractors are used on PARCC items for grades 4 and higher.
  - For computer-based assessments, the grade-appropriate rulers and protractors are provided through the computer-based platform.
  - For paper-based assessments, rulers and protractors are included in the PARCC-provided materials that are shipped to schools/districts.
  - Schools are **not allowed to provide their own rulers or protractors during PARCC assessments.**
PARCC MATHEMATICS TOOLS POLICY

- Grade 3 ruler provided on the PARCC paper-based assessments (1/4 inch units)

- Grades 4 and higher ruler provided on the PARCC paper-based assessments (1/8 inch units and centimeters)

- Grade 4 and higher protractor provided on the PARCC paper-based assessments
Mathematics Reference Sheets:

- Students in grades 3 and 4 will not have a reference sheet because the New Jersey Student Learning Standards for Mathematics for these grades do not require one. Students in grade 5 will be allowed to use the reference sheet posted. (See Informational Guide for Grade 5 for reference sheet.)

- For computer-based assessments, the grade 5 reference sheet is provided on the computer-based delivery platform. If desired, schools may also make printed copies available to students during administration.

- For paper-based assessments, the grade 5 reference sheet is provided in the PARCC-provided materials during shipment.

Scratch Paper:

- Blank scratch paper (graph, lined or un-lined paper) is intended for use by students to take notes and work through items during testing. If graph paper is used during instruction, it is recommended that schools provide graph paper as scratch paper for mathematics units. At least one sheet of scratch paper per unit must be provided to each student. Any work on scratch paper will not be scored.
Model Content Frameworks

- The frameworks serve as a bridge between the Standards and guiding the development of the formative tasks and diagnostic tools.
- Help curriculum developers and teachers as they work to implement the standards in their states and districts.
- Do not contain a suggested scope and sequence but rather provide examples of key content dependencies (where one concept ought to come before another), key instructional emphases, opportunities for in-depth work on key concepts and connections to critical practices.
- Clarify areas of emphasis in each grade and what changes in the standards from one grade to the next. It denotes which standards are Major content (sub-claim A), Additional content, and Supporting content (sub-claim B).
In mathematics, the performance levels at each grade level are written for each of five assessment sub-claims: (1) major content: (2) additional and supporting content: (3) reasoning; and (4) modeling.

The performance levels within each claim area are differentiated by a number of factors consistent with the NJSLS inclusion of standards for both mathematical content and mathematical practices and PARCC’s Cognitive Complexity Framework for Mathematics.

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 New Jersey Student Learning Standards. To support such claims, PARCC assessments are designed to measure and report results in multiple categories called master claims and sub-claims.

**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.

**Partnership for Assessment of Readiness for College and Careers (PARCC):** PARCC is a consortium of 4 states and D.C. working together to develop an assessment system for English language arts and mathematics anchored in what it takes to be ready for college and careers.
**Glossary**

**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 or at the conclusion of a course.

**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.
RESOURCES

- http://www.state.nj.us/education/assessment/
- http://www.state.nj.us/education/aps/cccs/math/
- http://parcc-assessment.org/
- http://parcc-assessment.org/released-items
- http://commoncoretools.me/
- https://www.illustrativemathematics.org/
- http://achievethecore.org/
- https://math.berkeley.edu/~wu/
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
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<td>609/633-6917</td>
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<td>609/341-3456</td>
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<td>609/292-4363</td>
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<td>609/292-8739</td>
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<td>PARCC Data Coordinator</td>
<td><a href="mailto:donald.white@doe.state.nj.us">donald.white@doe.state.nj.us</a></td>
<td>609/777-2051</td>
</tr>
</tbody>
</table>