Smarter Balanced
Understanding Score Reports
Topics

- Overview of Scores
- Claims and Targets
- Achievement Levels
High School* Math Level 3 or Above

Mean 31.15
Standard Dev. 14.32
Median 28.75
Minimum 5
Maximum 84.2
Range 79.2

*Data includes schools that report out as K-12 or Jr/Sr High.
Participation levels > 80%.
High School New Assessment

2008 OAKS Proficient (TESA)

2015 Smarter Balanced Percent Proficient

High Schools > 200 Students

r = .6110
Three Year Change

2011 OAKS Percent Proficient vs. 2008 OAKS Percent Proficient

Average Growth: 18.3
Standard Deviation: 11.4

High Schools > 200 Students

r = .5524
Student Performance at Each Achievement Level

How did my district perform overall in Mathematics?

Test: Grade 8 Mathematics
Year: 2014-2015
Name: Demo District

Average Scale Score and Percent at Each Achievement Level
OAKS/Smarter Mathematics Grade 8 Test for Students in Demo District

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of Students</th>
<th>Average Scale Score</th>
<th>Percent Proficient</th>
<th>Percent at Each Achievement Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Oregon</td>
<td>40954</td>
<td>2562 ±1</td>
<td>44</td>
<td>31 25 20 23</td>
</tr>
<tr>
<td>Demo District 9999</td>
<td>89</td>
<td>2592 ±11</td>
<td>56</td>
<td>20 24 22 34</td>
</tr>
<tr>
<td>Demo Middle School (88889999)</td>
<td>89</td>
<td>2592 ±11</td>
<td>56</td>
<td>20 24 22 34</td>
</tr>
</tbody>
</table>
District Performance for Each Claim

What are my district's strengths and weaknesses in Mathematics?

Test: Grade 5 Mathematics
Year: 2014-2015
Name: Demo District

Average Scale Score, Percent Proficient, and Percentage in Each Claims Performance Level
Grade 5 Mathematics Test for Students in Demo District

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of Students</th>
<th>Average Scale Score</th>
<th>Percent Proficient</th>
<th>Claims</th>
<th>Percentage in Each Claims Performance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Oregon</td>
<td>39174</td>
<td>2467 ±15</td>
<td>47</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Concepts and Procedures</td>
<td>34 34 33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Problem Solving and Modeling &amp; Data Analysis</td>
<td>34 31 35</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Communicating Reasoning</td>
<td>33 31 36</td>
</tr>
<tr>
<td>Demo District (9999)</td>
<td>84</td>
<td>2467 ±15</td>
<td>47</td>
<td>Mathematics</td>
<td>34 34 33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Concepts and Procedures</td>
<td>34 34 33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Problem Solving and Modeling &amp; Data Analysis</td>
<td>34 31 35</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Communicating Reasoning</td>
<td>33 31 36</td>
</tr>
<tr>
<td>Demo School (99991111)</td>
<td>5</td>
<td>2460 ±15</td>
<td>46</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Concepts and Procedures</td>
<td>35 32 33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Problem Solving and Modeling &amp; Data Analysis</td>
<td>31 32 37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Communicating Reasoning</td>
<td>35 33 32</td>
</tr>
</tbody>
</table>
**Performance on Each Content Standard**

OAKS/Smarter Mathematics Grade 5 Test for Students in Demo School

<table>
<thead>
<tr>
<th>Target</th>
<th>Performance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concepts and Procedures</strong></td>
<td></td>
</tr>
<tr>
<td>Write and interpret numerical expressions.</td>
<td></td>
</tr>
<tr>
<td>Analyze patterns and relationships.</td>
<td></td>
</tr>
<tr>
<td>Understand the place value system.</td>
<td></td>
</tr>
<tr>
<td>Perform operations with multi-digit whole numbers and with decimals to hundredths.</td>
<td></td>
</tr>
<tr>
<td>Use equivalent fractions as a strategy to add and subtract fractions.</td>
<td></td>
</tr>
<tr>
<td>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</td>
<td></td>
</tr>
<tr>
<td>Convert like measurement units within a given measurement system.</td>
<td></td>
</tr>
<tr>
<td>Represent and interpret data.</td>
<td></td>
</tr>
<tr>
<td>Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</td>
<td></td>
</tr>
<tr>
<td>Graph points on the coordinate plane to solve real-world and mathematical problems.</td>
<td></td>
</tr>
<tr>
<td>Classify two-dimensional figures into categories based on their properties.</td>
<td></td>
</tr>
</tbody>
</table>

**Comparison Scores**

<table>
<thead>
<tr>
<th>Name</th>
<th>Average Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Oregon</td>
<td>2467 ±15</td>
</tr>
<tr>
<td>Demo District</td>
<td>2467 ±15</td>
</tr>
<tr>
<td>Demo School (99991111)</td>
<td>2460 ±15</td>
</tr>
</tbody>
</table>
### Student Performance on Each Claim

**How did my students perform on the Mathematics test?**

- **Test:** Grade 5 Mathematics
- **Year:** 2014-2015
- **Name:** Demo School

#### Scale Scores, Achievement Levels, and Claims Performance Levels

<table>
<thead>
<tr>
<th>Name</th>
<th>SSID</th>
<th>Scale Score</th>
<th>Achievement Level</th>
<th>Concepts and Procedures Performance Level</th>
<th>Problem Solving and Modeling &amp; Data Analysis Performance Level</th>
<th>Communicating Reasoning Performance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo, CATHY</td>
<td>99999999904</td>
<td>2586 ±8</td>
<td>1</td>
<td>✓</td>
<td>⊗</td>
<td>✓</td>
</tr>
<tr>
<td>Demo, ERIN</td>
<td>99999999901</td>
<td>2460 ±22</td>
<td>1</td>
<td>⊗</td>
<td>⊗</td>
<td>✓</td>
</tr>
<tr>
<td>Demo, GERALDINE</td>
<td>99999999902</td>
<td>Invalidated</td>
<td>Invalidated</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Demo, Keyshawn</td>
<td>99999999900</td>
<td>2586 ±7</td>
<td>4</td>
<td>⊗</td>
<td>⊗</td>
<td>✓</td>
</tr>
<tr>
<td>Demo, LAUREN</td>
<td>99999999903</td>
<td>2666 ±9</td>
<td>3</td>
<td>⊗</td>
<td>⊗</td>
<td>✓</td>
</tr>
<tr>
<td>Demo, LYNN</td>
<td>99999999987</td>
<td>2668 ±23</td>
<td>4</td>
<td>⊗</td>
<td>⊗</td>
<td>✓</td>
</tr>
</tbody>
</table>
From Standards to Assessment

CCSS

Content Specifications

Claims

Targets
Claim 1 – Concepts and Procedures

Claim 1 is the only claim that is directly linked to the Common Core State Content Standards.

They are linked by way of the targets (which are cluster headings).

Grade 3: Target A

Operations and Algebraic Thinking

Represent and solve problems involving multiplication and division.

1. Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.

2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

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 x ? = 48, 5 = ? ÷ 3, 6 x 6 = ?.
Claim 2 - Problem Solving

Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.

Assessment Targets

Extracted from the text describing the expectations for students to engage in mathematical practices

Target A: Apply mathematics to solve well-posed problems in pure mathematics and those arising in everyday life, society, and the workplace.

Target B: Select and use appropriate tools strategically.

Target C: Interpret results in the context of a situation.

Target D: Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).
Claim 3 - Communicating Reasoning

Students clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

Assessment Targets

Extracted from the text describing the expectations for students to engage in mathematical practices

Target A: Test propositions or conjectures with specific examples.
Target B: Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures.
Target C: State logical assumptions being used.
Target D: Use the technique of breaking an argument into cases.
Target E: Distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in the argument—explain what it is.
Target F: Base arguments on concrete referents such as objects, drawings, diagrams, and actions.
Target G: At later grades, determine conditions under which an argument does and does not apply. (For example, area increases with perimeter for squares, but not for all plane figures.)
Let’s Start with the Blueprints

Four math claims, but three reporting categories
CAT portion has ALL of the Claim 1 items
Claims 2, 3, and 4 exist in both CAT and PT portions
Both CAT and PT portions contribute to overall score

<table>
<thead>
<tr>
<th>Claim/Score Reporting Category</th>
<th>Content Category</th>
<th>Stimuli</th>
<th>Items</th>
<th>Total Items by Claim</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CAT</td>
<td>PT</td>
<td>CAT</td>
</tr>
<tr>
<td>1. Concepts and Procedures</td>
<td>Priority Cluster</td>
<td>0</td>
<td>0</td>
<td>13-15</td>
</tr>
<tr>
<td></td>
<td>Supporting Cluster</td>
<td>0</td>
<td></td>
<td>4-5</td>
</tr>
<tr>
<td>2. Problem Solving</td>
<td>Problem Solving</td>
<td>0</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>4. Modeling and Data Analysis</td>
<td>Modeling and Data Analysis</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>3. Communicating Reasoning</td>
<td>Communicating Reasoning</td>
<td>0</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>
On the surface, there doesn’t appear to be much difference from grade 3 to HS. Let’s look closer…
In investigating Claim 1 (Concepts and Procedures) you can determine the relative importance of topics. What do you notice for Grade 4?

<table>
<thead>
<tr>
<th>Claim</th>
<th>Content Category</th>
<th>Assessment Targets</th>
<th>DOK</th>
<th>Items CAT PT</th>
<th>Total Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concepts and Procedures</td>
<td>Priority Cluster</td>
<td>A. Use the four operations with whole numbers to solve problems.</td>
<td>1, 2</td>
<td>8-9</td>
<td>0 17-20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E. Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
<td>1, 2</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F. Extend understanding of fraction equivalence and ordering.</td>
<td>1, 2</td>
<td>1-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.</td>
<td>1, 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D. Generalize place value understanding for multi-digit whole numbers.</td>
<td>1, 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H. Understand decimal notation for fractions, and compare decimal fractions.</td>
<td>1, 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supporting Cluster</td>
<td>I. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</td>
<td>1, 2</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>K. Geometric measurement: understand concepts of angle and measure angles.</td>
<td>1, 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Gain familiarity with factors and multiples.</td>
<td>1, 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Generate and analyze patterns.</td>
<td>2, 3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>J. Represent and interpret data.</td>
<td>1, 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</td>
<td>1, 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The number of items for Claims 2, 3, and 4 is the same across all grades (as are the targets).
Understanding Item Specifications
Over 1000 math items

http://www.smarterbalance.org/smarter-balanced-assessments

- Mathematics Smarter Balanced Summative Assessment Blueprint (PDF) (DocX)
- CAT Item Specs, Version 3.0 (9/28/2015)
- Claim 1, Grade 3 (ZIP)
- Claim 1, Grade 4 (ZIP)
- Claim 1, Grade 5 (ZIP)
- Claim 1, Grade 6 (ZIP)
- Claim 1, Grade 7 (ZIP)
- Claim 1, high school (ZIP)
- Claim 2, Grades 3-8 and high school (ZIP)
- Claim 3, Grades 3-8 and high school (ZIP)
- Claim 4, Grades 3-8 and high school (ZIP)
- Mathematics PT Item Specs All Grades (ZIP)
### Grade 3 Target G Item Specification

**Claim 1:** Concepts and Procedures  
Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

**Content Domain:** Measurement and Data

**Target G:** Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (DOK 1, 2)

Tasks for this target generally require students to solve straightforward one-step word problems using the four operations in situations involving time intervals in hours, liquid volume in liters, and mass/weight in grams and kilograms. Situations in which intervals of time are limited to addition and subtraction. Some foundational tasks assess telling and writing time to the nearest minute may be appropriate for building a range of difficulty in the adaptive item bank. The emphasis for this target is not on cultural aspects of time such as clocks but rather on time as a measurement quantity that can be operated on arithmetically like other more tangible measurement quantities.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</td>
<td>3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</td>
</tr>
</tbody>
</table>

**Description of the Target**

**Targeted Standards**
## Grade 3 Target G Item Specification

<table>
<thead>
<tr>
<th>Related Below-Grade and Above-Grade Standards for Purposes of Planning for Vertical Scaling:</th>
<th>Related Grade 2 Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.MD.A, 2.MD.A.3 2.MD.C, 2.MD.C.7</td>
<td>2MD.A Measure and estimate lengths in standard units.</td>
</tr>
<tr>
<td>4.MD.A, 4.MD.A.1, 4.MD.A.2</td>
<td>2.MD.A.3 Estimate lengths using units of inches, feet, centimeters, and meters.</td>
</tr>
<tr>
<td>2MD.C Work with time and money.</td>
<td>2MD.C Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.</td>
</tr>
</tbody>
</table>

### Related Grade 4 Standards

4.MD.A Solve problems involving measurement and conversion of measurements.

#### 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz.; L, ml; hr., min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft. is 12 times as long as 1 in. Express the length of a 4 ft. snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...

#### 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Grade 3 Target G Item Specification

<table>
<thead>
<tr>
<th>Achievement Level Descriptors</th>
<th>Statements of Required Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong> Students should be able to tell and write time to the nearest five-minute interval and solve addition and subtraction problems involving fifteen-minute time intervals.</td>
<td></td>
</tr>
<tr>
<td><strong>Level 2</strong> Students should be able to tell and write time to the nearest minute and solve one-step addition problems involving five-minute time intervals. They should be able to measure liquid volumes using liters and masses of objects using grams and kilograms and add or subtract to solve one-step word problems involving masses or liquid volumes that are given in the same units.</td>
<td></td>
</tr>
<tr>
<td><strong>Level 3</strong> Students should be able to solve one-step addition and subtraction problems involving time intervals in minutes. They should be able to multiply or divide to solve one-step problems involving masses or volumes that are given in the same units.</td>
<td></td>
</tr>
<tr>
<td><strong>Level 4</strong> Students should be able to solve one-step addition or subtraction problems involving all time intervals from hours to minutes.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence Required:</th>
<th>Multiple Choice, single correct response; Equation, word problems, tables, graphs, number line diagrams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The student tells and writes time to the nearest minute.</td>
<td></td>
</tr>
<tr>
<td>2. The student solves one-step word problems with addition and subtraction including time intervals in minutes.</td>
<td></td>
</tr>
<tr>
<td>3. The student solves one-step word problems involving liquid volume (liters) and mass (grams, kilograms) using operations.</td>
<td></td>
</tr>
</tbody>
</table>

**Allowable Response Types:**
- Multiple Choice, single correct response
- Equation
- Word problems
- Tables, graphs, number line diagrams

**Allowable Stimulus Materials:**
- Number line diagrams
- Measurement scales, tables, graphs
- Cups, analog clocks, digital clocks
# Grade 3 Target G Item Specification

<table>
<thead>
<tr>
<th>Construct-Relevant Vocabulary:</th>
<th>grams (g), kilograms (kg), liters (L), estimate, time, time intervals, minute, hour, measure, liquid volume, mass, standard units, metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable Tools:</td>
<td>None</td>
</tr>
<tr>
<td>Target Specific Attributes:</td>
<td>Word problems involving intervals of time are limited to addition and subtraction.</td>
</tr>
</tbody>
</table>

## Important Development Notes

- **Accessibility Guidance:**
  - Item writers should consider the following Language and Visual Element/Design guidelines when developing items.
  - Language Key Considerations:
    - Use simple, clear, and easy-to-understand language

## Development Notes

Some tasks coding to Evidence Statement 2 will be assessed in Claim 2 and Claim 4.

- Items calculating the interval of time using a number line with the beginning and ending times labeled will be assessed in Claim 2.
- Items calculating the interval of time using a chart with beginning and ending times labeled will be assessed in Claim 4.
- Items calculating an end time, given the start time using text or graphics and interval of time will be assessed in Claim 2.
Grade 3 Target G Item Specification

Task Model 1

Response Type: Multiple Choice, single correct response

DOK Level 1

3.MD.A.1
Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Evidence Required:
1. The student tells and writes time to the nearest minute.

Tools: None

Prompt Features: The student is prompted to identify time to the minute on an analog clock.

Stimulus Guidelines:
- Item difficulty can be adjusted via these example methods:
  - Model shows time to 15 or 30 minute intervals.
  - Model shows time to 5 minute intervals.
  - Model shows time to 1 minute intervals.

TM1
Stimulus: The student is prompted to identify time, in minutes, on an analog clock.

Example Stem: Use this clock to answer the question.

[Image of an analog clock]

Select the time, to the nearest minute, shown on the clock.

A. 1:15
B. 2:07
C. 3:07
D. 7:15

Rubric: (1 point) The student correctly selects the time displayed on the clock (e.g., C).

Response Type: Multiple Choice, single correct response
Grade 3 Target G Item Specification

Task Model 2
Response Type: Equation/Numeric

DOK Level 2
3.MD.A.1
Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Evidence Required:
2. The student solves one-step word problems with addition and subtraction including time intervals in minutes.

Tools: None

Prompt Features: The student is prompted to enter an interval of time in minutes.

Stimulus Guidelines:
- Times within each item can include any of the following:
  - 15 minutes intervals
  - 5 minute intervals
  - 1 minute intervals
- Item difficulty can be adjusted via this example method:
  - Calculate intervals of time presented in a contextual word problem.

TM2
Stimulus: The student is presented with a one-step, contextual problem using images of clocks or text only.

Example Stem: A music class starts at 1:32 p.m and ends at 2:15 p.m.

Enter the length, in minutes, of the music class.

Rubric: (1 point) The student correctly enters the length of the class in minutes (e.g., 43).

Response Type: Equation/Numeric
Grade 3 Target G Item Specification

**Task Model 3**

**Response Type:** Equation/Numeric

**DOK Level 2**

3.MD.A.2
Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

**Evidence Required:**
3. The student solves one-step word problems involving liquid volume (liters) and mass (grams, kilograms) using the four operations.

**Tools:** None

**Prompt Features:** The student is prompted to enter the solution to a one-step contextual word problem involving measurement.

**Stimulus:**
- Measurements may be mass (g, kg) or liquid volume (L).
- Item difficulty can be adjusted via these example methods:
  - Addition/subtraction within 100; with or without regrouping
  - Addition with a sum within 1000; with or without regrouping
  - Subtraction with a minuend within 1000; with or without regrouping
  - Multiplication with a product within 100
  - Division with a single-digit divisor and dividend within 100
- A graphic may or may not be included.

**TM3**

**Stimulus:** The student is presented with a one-step contextual word problem.

**Example Stem 1:** A bunch of celery has a mass of 48 grams. A carrot has a mass that is 15 grams more than the celery.

![Celery and Carrot](image)

Enter the mass, in grams, of the carrot.

**Example Stem 2:** A farmer takes 46 kilograms of potatoes to the market. The farmer sells 29 kilograms of the potatoes.

Enter the number of kilograms of potatoes the farmer has left.

**Rubric:** (1 point) The student writes the correct solution (e.g., 63; 17).

**Response Type:** Equation/Numeric
<table>
<thead>
<tr>
<th>Task Model 3</th>
<th>TM3 (continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response Type:</strong> Equation/Numeric</td>
<td><strong>Example Stem 3:</strong> Harold buys 2-liter bottles of juice for a picnic. He buys 8 bottles.</td>
</tr>
<tr>
<td><strong>DOK Level 2</strong></td>
<td>How many liters of juice did Harold buy?</td>
</tr>
<tr>
<td>3.MD.A.2</td>
<td><strong>Example Stem 4:</strong> Mrs. Ross made 48 liters of fruit juice for a school picnic. She gives all of the juice to 8 classrooms with each classroom getting the same amount of juice.</td>
</tr>
<tr>
<td>Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</td>
<td>How many liters of juice does Mrs. Ross give each classroom?</td>
</tr>
<tr>
<td><strong>Evidence Required:</strong> 3. The student solves one-step word problems involving liquid volume (liters) and mass (grams, kilograms) using the four operations.</td>
<td><strong>Rubric:</strong> (1 point) The student writes the correct solution (e.g., 16; 6).</td>
</tr>
<tr>
<td><strong>Tools:</strong> None</td>
<td><strong>Response Type:</strong> Equation/Numeric</td>
</tr>
</tbody>
</table>
Brady started to fill the box shown with some unit cubes.

Enter the total number of unit cubes needed to completely fill the box. Include the unit cubes already shown in your total.

<table>
<thead>
<tr>
<th>Item</th>
<th>Claim</th>
<th>Domain</th>
<th>Target</th>
<th>DOK</th>
<th>CONTENT</th>
<th>MP</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>#16</td>
<td>2</td>
<td>NS, MD</td>
<td>D</td>
<td>2</td>
<td>6.NS.B, 5.MD.C.5</td>
<td>6, 7</td>
<td>210</td>
</tr>
</tbody>
</table>
Example Item 3C.1b (Grade 7)
Primary Target 3C (Content Domain G), Secondary Target 1F (CCSS 7.G.B), Tertiary Target 3G

Glenn saw the figure below and said, "If I find the length (l), width (w), and radius (r), then the area (A) of the shaded region is \( A = l \cdot w - \pi r^2.\)"

Which assumptions must Glenn be making in order for his equation to give the correct area of the shaded region? Select all that apply.

A. The quadrilateral is a rhombus.
B. The quadrilateral is a rectangle.
C. The curved figure in the center is a circle.
D. The curved figure in the center is a sphere.
Example Item 4E.2a (Grade 8)
Primary Target 4E (Content Domain F), Secondary Target 1F (CCSS 8.F.B), Tertiary Target 4F, Quaternary Target 4D
(Source: Adapted from Illustrative Mathematics 8-F Modeling with a Linear Function)

Select all situations that can be modeled by the linear equation $y = 2x + 5$.

A. There are initially 5 rabbits on a farm. Each month thereafter the number of rabbits is 2 times the number in the month before. How many rabbits are there after $x$ months?

B. Joe earns $2 for each magazine sale. He also earns $5 for each hour he spends trying to sell magazines. How much money will he earn after selling magazines for $x$ hours?

C. Sandy charges $2 an hour for babysitting. Parents are charged $5 if they arrive home later than scheduled. Assuming the parents arrived home late, how much money does she earn for $x$ hours?

D. The Reader’s Club is a members-only audio book rental store. There is a $2 sign-up fee and a $5 per audio book rental fee. How much would Laney owe on her first visit if she becomes a member and rents $x$ audio books?

E. Andre is saving money for a new CD player. He began saving with a $5 gift and will continue to save $2 each week. How much money will he have saved at the end of $x$ weeks?
Level 4: The student has exceeded the achievement standard and demonstrates advanced progress toward mastery of the knowledge and skills needed for likely success in future coursework*.

Level 3: The student has met the achievement standard and demonstrates progress toward mastery of the knowledge and skills needed for likely success in future coursework*.

Level 2: The student has nearly met the achievement standard and may require further development to demonstrate the knowledge and skills needed for likely success in future coursework*.

Level 1: The student has not met the achievement standard and needs substantial improvement to demonstrate the knowledge and skills needed for likely success in future coursework*

* Likely success in entry-level credit-bearing college coursework after high school.
### Threshold Achievement Level Descriptors

#### Target Sampling Mathematics Grade 5

<table>
<thead>
<tr>
<th>Claim</th>
<th>Content Category</th>
<th>Assessment Targets</th>
<th>DOK</th>
<th>Items CAT</th>
<th>Items PT</th>
<th>Total Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concepts and Procedures</td>
<td>Priority Cluster</td>
<td>E. Use equivalent fractions as a strategy to add and subtract fractions.</td>
<td>1, 2</td>
<td>5-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</td>
<td>1, 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</td>
<td>1, 2</td>
<td>4-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>D. Perform operations with multi-digit whole numbers and with decimals to hundredths.</td>
<td>1, 2</td>
<td>3-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Understand the place value system.</td>
<td>1, 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supporting Cluster</td>
<td>J. Graph points on the coordinate plane to solve real-world and mathematical problems.</td>
<td>1</td>
<td>2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>K. Classify two-dimensional figures into categories based on their properties.</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Write and interpret numerical expressions.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Analyze patterns and relationships.</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G. Convert like measurement units within a given measurement system.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H. Represent and interpret data.</td>
<td>1, 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CONCEPTS AND PROCEDURES

#### Targets E and F:

#### Number and Operations – Fractions

- Subtract fractions and mixed numbers with unlike denominators in word problems.
- Use benchmark fractions and number sense of fractions to estimate and assess the reasonableness of answers.
- Multiply a mixed number by a mixed number.
- Use visual models when multiplying two fractions, including when one fraction is larger than 1.
- Interpret division of a whole number by any unit fraction.
Achievement Level 1

Grade 3
Claim 1
Target F

11497
Decide whether each comparison is true or false. Click True or False for each comparison.

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{2}{8} \leq \frac{3}{8} )</td>
<td>☐</td>
</tr>
<tr>
<td>( \frac{6}{5} \geq \frac{7}{5} )</td>
<td>☐</td>
</tr>
</tbody>
</table>

Grade 4
Claim 1
Target L

16281
Decide whether the line appears to be a line of symmetry for the shape. Select Yes or No for each shape.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
This graph shows the balance in Bennett’s bank account as a function of time.

Drag the star to mark the point where his account had the highest balance. Then drag the circle to mark the point where his account had the lowest balance.
Achievement Level 2

Grade 3
Claim 3
Target D

Drag a number into each box to make each statement true. You may use numbers more than once.

\[
\frac{\square}{5} > \frac{3}{5}
\]

\[
\frac{\square}{5} < \frac{3}{5}
\]

\[
\frac{\square}{5} = \frac{3}{5}
\]

Grade 5
Claim 3
Target F

The art teacher gives stickers to the 96 students in her classes. She has 264 stickers to give out. She gives out one sticker at a time to each of her students until the stickers are all gone. How many students get more than 2 stickers?

A 36
B 72
C 82
D 96
Achievement Level 2

**8058**
Evan’s car can travel 84 miles on 3 gallons of gas. Using this rate, he constructs a table showing the number of miles that his car can travel on different amounts of gas.

**Part A**
Click on each of the errors in Evan’s table.

**Part B**
Select the number of miles Evan’s car can travel on 1 gallon of gas.

<table>
<thead>
<tr>
<th>Gallons of Gas</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles Traveled</td>
<td>56</td>
<td>112</td>
<td>156</td>
<td>224</td>
<td>300</td>
</tr>
</tbody>
</table>

**532**
Enter the value of \( x \) that makes the equation true.

\[ \sqrt{x} - 2 = 4 \]

Grade 6
Claim 3
Target E

Grade 11
Claim 1
Target H
Achievement Level 3

Grade 3
Claim 1
Target H

Mr. Lowe asked his students to vote for their favorite bird. A total of 22 students voted.

<table>
<thead>
<tr>
<th>Bird</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robin</td>
<td></td>
</tr>
<tr>
<td>Bluejay</td>
<td></td>
</tr>
<tr>
<td>Cardinal</td>
<td></td>
</tr>
<tr>
<td>Hawk</td>
<td></td>
</tr>
</tbody>
</table>

Click above Hawk on the graph to show the number of students who chose it as their favorite bird.

Grade 5
Claim 1
Target I

Jonas has a file cabinet in the shape of a right rectangular prism.

- The area of the base of the file cabinet is 450 square inches.
- The height of the file cabinet is 53 inches.

Enter the volume, in cubic inches, of the file cabinet.
Achievement Level 3

**Grade 11**
Claim 1
Target O

**Grade 7**
Claim 1
Target E

Consider this right triangle.

\[ \begin{align*}
A & \quad 12 \\
B & \quad 37 \\
C & \quad 35
\end{align*} \]

Determine whether each equation is correct. Select Yes or No for each equation.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \sin(A) = \frac{35}{37} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \cos(A) = \frac{12}{35} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \sin(B) = \frac{35}{37} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \tan(B) = \frac{12}{35} )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure A is a scale image of Figure B, as shown.

The scale that maps Figure A onto Figure B is 1:4 \( \frac{1}{2} \). Enter the value of \( x \).
Joel is playing a number game.

- First, he subtracts 300 from a number.
- Then, he adds 25 to the new number.
- The answer is a number less than 460.

Click Yes, if the number is one Joel could have started with. Click No, if the number is one Joel could not have started with.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>736</td>
<td></td>
</tr>
<tr>
<td>734</td>
<td></td>
</tr>
<tr>
<td>738</td>
<td></td>
</tr>
<tr>
<td>732</td>
<td></td>
</tr>
</tbody>
</table>
Achievement Level 4

Grade 8
Claim 4
Target A

Steven is making a pattern of a spiral as shown in the figure.

He started by making an isosceles right triangle with legs of length 1. He then made a new isosceles right triangle, using the hypotenuse of the first triangle as one of the legs of the new right triangle. He will continue making right triangles using this pattern until he has made a triangle with a hypotenuse with a length of 8.

Determine how many of these triangles, including the three shown in the figure, Steven will make.
Equation Editor Tutorial

Practice creating equations:

1. $5(3 + 2) - 4$
2. $2 \frac{1}{2} - \frac{2}{3} = 1 \frac{5}{6}$
3. $\frac{x^{3-2}}{4} = \frac{1}{4}$

Press here to see how you did.
Thoughts about Smarter Balanced Tests

“Smarter Balanced is committed to ensuring high quality assessments that promote higher level thinking. The assessments are designed by real educators from across the United States... I had the opportunity to observe and contribute to tasks that truly assess students on what educators are teaching... My involvement in this process removes the myth that we are ‘teaching to the test.’ We are in reality, ‘testing to the teaching.’ ”

~ Shannon Callahan, mathematics teacher, Helena, MT
Equation Editor Tutorial
http://demo.tds.airast.org/EQTutorial/?c=Oregon_PT

Sample Items by Student Performance Levels
http://www.cde.ca.gov/ta/tg/ca/caasppssreports.asp

ORS User Guide
http://www.ode.state.or.us/wma/teachlearn/testing/oaks/oaks_reports_userguide.pdf

Threshold ALDs
http://www.ode.state.or.us/search/page/?id=4301

Smarter Balanced Assessment Blueprint
http://www.ode.state.or.us/wma/teachlearn/testing/dev/testspecs/sb_math_blueprint_1415.pdf

Publishers Criteria (Progress to Algebra)
http://www.corestandards.org/assets/Math_Publishers_Criteria_K-8_Summer%202012_FINAL.pdf