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| <p><b>Task Model 1a</b></p> <p><b>Response Type:</b><br/>Equation/Numeric</p> <p><b>DOK Level 1</b></p> <p><b>4.MD.A.1</b><br/>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. <i>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), ...</i></p> <p><b>Evidence Required:</b><br/>1. The student converts measurements from larger units to smaller units within a single system of units.</p> <p><b>Tools:</b> None</p> | <p><b>Prompt Features:</b> The student converts measurements within one system of units.</p> <p><b>Stimulus Guidelines:</b></p> <ul style="list-style-type: none"> <li>• Conversion must be from larger unit to smaller unit within the same system of measurement.</li> <li>• Items will involve one of these:             <ul style="list-style-type: none"> <li>◦ Distances (km, m, cm; in, ft, yd)</li> <li>◦ Intervals of time (hr, min, sec)</li> <li>◦ Liquid volumes (L, mL)</li> <li>◦ Masses of objects (kg, g; lb, oz)</li> </ul> </li> <li>• Item difficulty can be adjusted via these example methods:             <ul style="list-style-type: none"> <li>◦ Conversions involving one or two levels of separation within the same system of measurement (e.g., feet to inches would be one level of separation; yards to inches would be two levels of separation)</li> <li>◦ Use of fractions and decimals</li> </ul> </li> </ul> <p><b>TM1a</b><br/><b>Stimulus:</b> The student is presented with a measurement.</p> <p><b>Example Stem 1:</b> Enter the unknown number that makes the statement true.</p> <p>3.5 centimeters = □ millimeters</p> <p><b>Example Stem 2:</b> Enter the unknown number that makes the statement true.</p> <p>6 feet = □ inches</p> <p><b>Rubric:</b> (1 point) The student enters the correct value (e.g., 35; 72).</p> <p><b>Response Type:</b> Equation/Numeric</p> |
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**Task Model 1b****Response Type:**  
**Matching Tables****DOK Level 1****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), ...*

**Evidence Required:**

1. The student converts measurements from larger units to smaller units within a single system of units.

**Tools:** None

**Prompt Features:** The student converts measurements within one system of units.

**Stimulus Guidelines:**

- Measurements in the table must be in smaller units than the measurement in the stem.
- Answer choices should be in the form of whole number, decimal (only if dealing with money), or fractional units from the same system.
- Items will involve one of these:
  - Distances (km, m, cm; in, ft, yd)
  - Intervals of time (hr, min, sec)
  - Liquid volumes (L, mL)
  - Masses of objects (kg, g; lb, oz)
- Item difficulty can be adjusted via this example method:
  - Conversions involving one or two levels of separation within the same system of measurement (e.g., feet to inches would be one level of separation; yards to inches would be two levels of separation)

**TM1b**

**Stimulus:** The student is presented with one measurement in the stem.

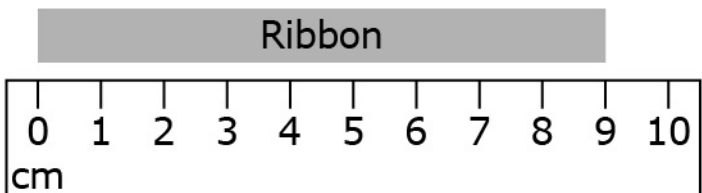
**Example Stem:** Decide whether each measurement is equal to 5 yards. Select Yes or No for each measurement.

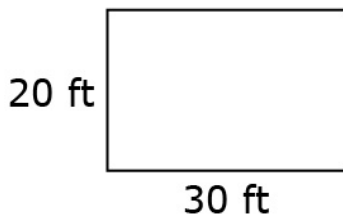
|            | Yes | No |
|------------|-----|----|
| 180 inches |     |    |
| 27 inches  |     |    |
| 15 feet    |     |    |

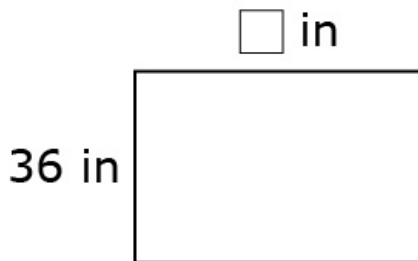
**Rubric:** (1 point) Student correctly selects yes or no for each of the given equivalencies (e.g., Y, N, Y).

**Response Type:** Matching Tables

| <p><b>Task Model 2</b></p> <p><b>Response Type:</b><br/><b>Fill-in Table</b></p> <p><b>DOK Level 2</b></p> <p><b>4.MD.A.1</b><br/>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. <i>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), ...</i></p> <p><b>Evidence Required:</b><br/>2. The student records measurement equivalents in a two-column table.</p> <p><b>Tools:</b> None</p> | <p><b>Prompt Features:</b> The student is prompted to complete a table of equivalent measurements.</p> <p><b>Stimulus Guidelines:</b></p> <ul style="list-style-type: none"> <li>The left column represents larger units and the right is for smaller units.</li> <li>The right column should be empty.</li> <li>Items will involve one of these:             <ul style="list-style-type: none"> <li>Distances (km, m, cm; in, ft, yd)</li> <li>Intervals of time (hr, min, sec)</li> <li>Liquid volumes (L, mL)</li> <li>Masses of objects (kg, g; lb, oz)</li> </ul> </li> <li>Item difficulty can be adjusted via these example methods:             <ul style="list-style-type: none"> <li>Conversions involving one or two levels of separation within the same system of measurement (e.g., feet to inches would be one level of separation; yards to inches would be two levels of separation)</li> <li>The use of fractions or decimals</li> <li>The number of conversions the student must make (from 2 to 4 conversions per item)</li> </ul> </li> </ul> <p><b>TM2</b><br/><b>Stimulus:</b> The student is presented with a two-column table.</p> <p><b>Example Stem:</b> Enter the unknown numbers to complete the table of equal measurements.</p> <table border="1"> <thead> <tr> <th>Feet</th><th>Inches</th></tr> </thead> <tbody> <tr> <td>3</td><td></td></tr> <tr> <td>5</td><td></td></tr> </tbody> </table> <p><b>Interaction:</b> The student enters the number of inches into the response boxes.</p> <p><b>Rubric:</b> (1 point) The student enters the correct equivalencies for the given measurements (e.g., 36, 60).</p> <p><b>Response Type:</b> Fill-in Table</p> | Feet | Inches | 3 |  | 5 |  |
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| Feet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Inches                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |        |   |  |   |  |
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| <p><b>Task Model 3a</b></p> <p><b>Response Type:</b><br/><b>Equation/Numeric</b></p> <p><b>DOK Level 2</b></p> <p><b>4.MD.A.2</b><br/>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.</p> <p><b>Evidence Required:</b><br/>3. The student identifies measurement quantities from diagrams, such as number line diagrams that feature a measurement scale, and uses the information to solve word problems.</p> <p><b>Tools:</b> None</p> <p><b>Version 3 update:</b><br/>Revised the stem in TM3a to clarify the change in units. Retired TM3b.</p> | <p><b>Prompt Features:</b> The student uses a diagram, such as a number line that features a measurement scale, to solve word problems.</p> <p><b>Stimulus Guidelines:</b></p> <ul style="list-style-type: none"> <li>Items will involve one of these: <ul style="list-style-type: none"> <li>Distances (km, m, cm; in, ft, yd)</li> <li>Intervals of time (hr, min, sec)</li> <li>Liquid volumes (L, mL)</li> <li>Masses of objects (kg, g; lb, oz)</li> </ul> </li> </ul> <p><b>TM3a</b><br/><b>Stimulus:</b> The student is presented with an object or quantity that can be measured using a number line diagram with a measurement scale.</p> <p><b>Example Stem:</b> A ribbon is shown above a centimeter ruler. Enter the length, in <b>millimeters</b>, of the ribbon.</p> <div>  </div> <p><b>Rubric:</b> (1 point) The student enters the correct measurement shown in the diagram (e.g., 90).</p> <p>Note: Depending on the diagram, a range of responses may need to be accepted. It is reasonable to allow 89-91 mm for the example shown above.</p> <p><b>Response Type:</b> Equation/Numeric</p> |
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| <p><b>Task Model 4a</b></p> <p><b>Response Type:</b><br/>Equation/Numeric</p> <p><b>DOK Level 1</b></p> <p><b>4.MD.A.3</b><br/>Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i></p> <p><b>Evidence Required:</b><br/>4. The student uses the area and perimeter formulas for rectangles to solve problems in mathematical and real-world contexts.</p> <p><b>Tools:</b> None</p> | <p><b>Prompt Features:</b> The student uses the area formula and/or perimeter formula to solve a problem in a mathematical or real-world context.</p> <p><b>Stimulus Guidelines:</b></p> <ul style="list-style-type: none"> <li>Items may describe rectangles (in pure math context) or rectangular shapes (in a real-world context). The shapes presented in real-world contextual items must be described as “rectangular” (e.g., a rectangular garden, a rectangular kitchen, etc.).</li> <li>The dimensions should be whole numbers with units listed.</li> <li>Item difficulty can be adjusted via these example methods:             <ul style="list-style-type: none"> <li>How “friendly” the numbers are to work with</li> <li>Including a visual diagram with labeled sides</li> </ul> </li> </ul> <p><b>TM4a</b><br/><b>Stimulus:</b> The student is presented with the dimensions of a rectangle.</p> <p><b>Example Stem:</b> Use the diagram of the rectangular garden to solve the problem.</p> <div>  </div> <p>Enter the area, in square feet, of the garden.</p> <p><b>Rubric:</b> (1 point) The student enters the correct number (e.g., 600).</p> <p><b>Response Type:</b> Equation/Numeric</p> |
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| <p><b>Task Model 4b</b></p> <p><b>Response Type:</b><br/>Equation/Numeric</p> <p><b>DOK Level 2</b></p> <p><b>4.MD.A.3</b><br/>Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i></p> <p><b>Evidence Required:</b><br/>4. The student uses the area and perimeter formulas for rectangles to solve problems in mathematical and real-world contexts.</p> <p><b>Tools:</b> None</p> | <p><b>Prompt Features:</b> The student uses the area formula and/or perimeter formula to solve a problem in a mathematical or real-world context.</p> <p><b>Stimulus Guidelines:</b></p> <ul style="list-style-type: none"> <li>Items may describe rectangles (in pure math context) or rectangular shapes (in a real-world context). The shapes presented in real-world contextual items must be described as “rectangular” (e.g., a rectangular garden, a rectangular kitchen, etc.).</li> <li>The dimensions, areas, and perimeters should be whole numbers with units listed.</li> <li>Item difficulty can be adjusted via these example methods: <ul style="list-style-type: none"> <li>How “friendly” the numbers are to work with</li> <li>Including a visual diagram with labeled sides</li> </ul> </li> </ul> <p><b>TM4b</b><br/><b>Stimulus:</b> The student is presented with one dimension and either the area or perimeter of a rectangle and must find the unknown side length.</p> <p><b>Example Stem:</b> Use the diagram of the rectangle to solve the problem.</p> <div style="text-align: center;">  </div> <p>The perimeter of the rectangle is 192 inches. What is the length, in inches, of the unknown side?</p> <p><b>Rubric:</b> (1 point) The student enters the correct number (e.g., 60).</p> <p><b>Response Type:</b> Equation/Numeric</p> |
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**Task Model 4c****Response Type:**  
**Matching Tables****DOK Level 2****4.MD.A.3**

Apply the area and perimeter formulas for rectangles in real-world problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

**Evidence Required:**

4. The student uses the area and perimeter formulas for rectangles to solve problems in mathematical and real-world contexts.

**Tools:** None

**Prompt Features:** The student is prompted to identify possible dimensions of a rectangle.

**Stimulus Guidelines:**

- Items may describe rectangles (in pure math context) or rectangular shapes (in a real-world context). The shapes presented in real-world contextual items must be described as "rectangular" (e.g., a rectangular garden, a rectangular kitchen, etc.).
- The dimensions, areas, and perimeters should be whole numbers with units listed.
- Item difficulty can be adjusted via this example method:
  - How "friendly" the numbers are to work with

**TM4c**

**Stimulus:** The student is presented with the area or perimeter of a rectangle.

**Example Stem 1:** The dimensions for three rectangles are shown. Decide whether each rectangle has an area equal to 100 square feet. Select Yes or No for each rectangle.

|                                                     | Yes | No |
|-----------------------------------------------------|-----|----|
| Rectangle 1:<br>• Length = 5 ft<br>• Width = 20 ft  |     |    |
| Rectangle 2:<br>• Length = 10 ft<br>• Width = 10 ft |     |    |
| Rectangle 3:<br>• Length = 4 ft<br>• Width = 25 ft  |     |    |

**Example Stem 2:** The dimensions for three rectangular gardens are shown. Decide whether each garden has a perimeter equal to 100 meters. Select Yes or No for each garden.

|                                                | Yes | No |
|------------------------------------------------|-----|----|
| Garden 1:<br>• Length = 5 m<br>• Width = 45 m  |     |    |
| Garden 2:<br>• Length = 50 m<br>• Width = 50 m |     |    |
| Garden 3:<br>• Length = 4 m<br>• Width = 25 m  |     |    |

**Rubric:** (1 point) The student selects all of the correct dimensions for the rectangle (e.g., Y, Y, Y; Y, N, N).

**Response Type:** Matching Tables