

Vertical Progression:

<p>2nd Grade</p>	<p>2.MD.A Measure and estimate lengths in standard units.</p> <ul style="list-style-type: none"> ○ 2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. ○ 2.MD.A.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen. <p>2.MD.B Relate addition and subtraction to length.</p> <ul style="list-style-type: none"> ○ 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
<p>3rd Grade</p>	<p>3.MD.A Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.</p> <ul style="list-style-type: none"> ○ 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. ○ 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 to represent the problem. <p>3.MD.C Geometric measurement: understand concepts of area and relate area to multiplication and addition.</p> <ul style="list-style-type: none"> ○ 3.MD.C.7 Relate area to the operations of multiplication and addition. ○ 3.MD.C.7.a Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. ○ 3.MD.C.7.b Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. ○ 3.MD.C.7.c Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. ○ 3.MD.C.7.d Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. <p>3.MD.D Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</p> <ul style="list-style-type: none"> ○ 3.MD.D.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
<p>4th Grade</p>	<p>4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p> <ul style="list-style-type: none"> ○ 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. ○ 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals or 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

ELG 4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit

	<p>smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.</p> <ul style="list-style-type: none"> ○ 4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
5 th Grade	<p>5.MD.A Convert like measurement units within a given measurement system.</p> <ul style="list-style-type: none"> ○ 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. <p>5.MD.C Geometric measurement: understand concepts of volume and relate volume to multiplication and addition.</p> <ul style="list-style-type: none"> ○ 5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. ○ 5.MD.C.5.a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. ○ 5.MD.C.5.b Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. ○ 5.MD.C.5.c Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Students will demonstrate command of the ELG by:

- Expressing measurements in terms of smaller or larger units that are equivalent.
- Knowing the relative size of measurements within a single measurement system and knowing how to express larger units in terms of smaller units.
- Solving problems involving measuring and converting measurements from larger units to smaller units.
- Converting measurements within one measurement system from larger units to smaller units and record measurement equivalents in two-column tables.
- Using the four operations to solve word problems involving distance, 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 larger units in terms of smaller units.
- Using pictures, models or words to explain the relationship between area and perimeter.
- Applying the formulas of perimeter and area for rectangles in real-world and mathematical problems.

Vocabulary:

- | | | |
|--------------|-----------------------|---------|
| • centimeter | • kilometer | • mile |
| • conversion | • length | • ounce |
| • distance | • liquid volume liter | • pint |
| • equivalent | • mass | • pound |
| • gallon | • meter | • quart |
| • gram | • metric | • yard |
| • kilogram | • milliliter | |

Sample Instructional/Assessment Tasks:

1) Standard: 4.MA.A.1

Source: <https://grade4commoncoremath.wikispaces.hcps.org/Assessing+4.MD.1>

Item Prompt:

Josie asked if she and her three brothers could take turns standing on the scale, so the worker let the kids weigh themselves. Their weights in kilograms are listed in the chart.

Metric Weight

kilograms	grams
32	
18	
45	

- A. Fill in the rest of the chart to show each child's weight in grams.
- B. Describe the relationship between kilograms and grams. You may use numbers, words, and/or symbols to show your thinking.

Correct Answer:

- A. 32,000 g; 18,000 g; 45,000 g
- B. Students' answers will vary. Within their description, students need to provide evidence that they understand there are 1,000 grams in 1 kilogram

2) Standard: 4.MA.A.2, 4.MA.A.3

Source: <https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.MD.2>

Item Prompt:

The perimeter of the rectangular state park shown is 42 miles.



A ranger estimates that there are 9 deer in each square mile of the park.

If this estimate is correct, how many total deer are in the park? Explain your answer.

Correct Answer:

There are 936 deer in the park.

Perimeter = $8 + 8 + 13 + 13 = 42$ miles; so the length of the park is 13 miles.

Area = 8 miles x 13 miles = 104 sq. miles

$104 \times 9 = 936$ deer