

#### Vertical Progression:

<b>1<sup>st</sup> Grade</b>	<p><b>1.MD.A Measure lengths indirectly and by iterating length units.</b></p> <ul style="list-style-type: none"> <li>○ <b>1.MD.A.2</b> Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i></li> </ul>
<b>2<sup>nd</sup> Grade</b>	<p><b>2.MD.A Measure and estimate lengths in standard units.</b></p> <ul style="list-style-type: none"> <li>○ <b>2.MD.A.1</b> Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.</li> <li>○ <b>2.MD.A.3</b> Estimate lengths using units of inches, feet, centimeters, and meters.</li> </ul> <p><b>2.MD.B Relate addition and subtraction to length.</b></p> <ul style="list-style-type: none"> <li>○ <b>2.MD.B.5</b> 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.</li> </ul>
<b>3<sup>rd</sup> Grade</b>	<p><b>3.MD.D Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</b></p> <ul style="list-style-type: none"> <li>○ <b>3.MD.D.8</b> 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.</li> </ul>
<b>4<sup>th</sup> Grade</b>	<p><b>4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</b></p> <ul style="list-style-type: none"> <li>○ <b>4.MD.A.3</b> Apply the area and perimeter formulas for rectangles in real world and mathematical problems.</li> </ul>

#### Students will demonstrate command of the ELG by:

- Solving real world problems using perimeters of polygons.
- Calculating the perimeter given the side lengths of a polygon.
- Determining an unknown side length of a polygon using information about the perimeter.
- Creating polygons with the same perimeter but different areas.
- Creating polygons with the same area but different perimeters.
- Finding the length of an unknown side if the other side lengths and the total perimeter are known.

#### Vocabulary:

- area
- hexagon
- parallelogram
- perimeter
- polygon
- quadrilateral
- rectangle
- rhombus
- square

#### Sample Instructional/Assessment Tasks:

##### 1) Standard: 3.MD.D.8

Source: <http://www.k-5mathteachingresources.com/support-files/designing-a-rabbit-enclosure.pdf>

##### Item Prompt: Designing a Rabbit Enclosure

1. Sarah has 18 feet of fence to build a rectangular shaped enclosure on the grass for her pet rabbit. Record all the possible designs for the rabbit enclosure.
2. Which design would provide the largest grass area for the rabbit? Show your work.
3. What is the difference between the largest and smallest possible grass areas?

##### Correct Answers:

ALL possible designs include: rectangular enclosures measuring 1 by 8 with an area of 8 square feet, 2 by 7 with an area of 14 square feet, 3 by 6 with an area of 18 square feet, and 4 by 5 with an area of 20 square feet. The difference between the largest and small possible areas is  $20 - 8 = 12$  square feet.

##### 2) Standard(s): 3.MD.D.8

Source: <https://www.engageny.org/resource/grade-3-mathematics-module-7-topic-c-lesson-14>

##### Item Prompt: Whose work is correct?

5. Mr. Spooner draws a regular hexagon on the board. One of the sides measures 4 centimeters. Giles and Xander find the perimeter. Their work is shown below. Whose work is correct? Explain your answer.

Giles' Work
Perimeter = 4 cm + 4 cm + 4 cm + 4 cm + 4 cm + 4 cm
Perimeter = 24 cm

Xander's Work
Perimeter = $6 \times 4$ cm
Perimeter = 24 cm

##### Correct Answer:

Both Giles and Xander are correct because adding 4 six times is the same as multiplying 4 by six.

#### 3) Standard(s): 3.MD.D.8

**Source:** <http://www.k-5mathteachingresources.com/support-files/perim-word-problems.pdf>

**Item Prompt: Perimeter**

The width of a square is 12cm. Ben measured the perimeter and said that it was 24cm. Is Ben correct? Explain your thinking.

**Correct Answer:**

Ben is not correct because if the width of a square is 12 cm, then each side would be 12 cm which would make the perimeter  $4 \times 12$  which equals a perimeter of 48 inches.