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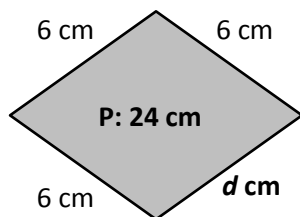
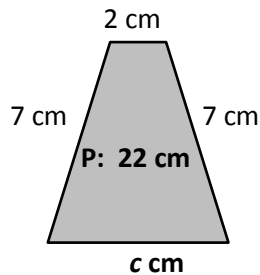
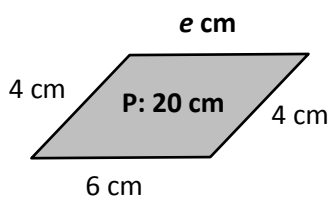
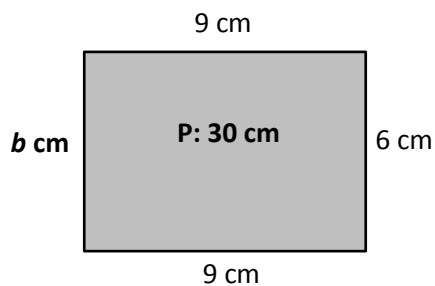
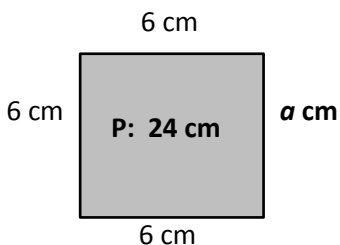
Date _____

1. Katy and Jane construct a four-sided wall to surround their castle. The wall has a perimeter of 100 feet. One side measures 16 feet. A different side measures 16 feet. A third side measures 34 feet.
 - a. Draw and label a diagram of the wall. Use a letter to represent the unknown side length.

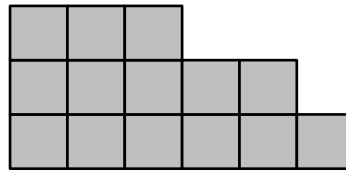
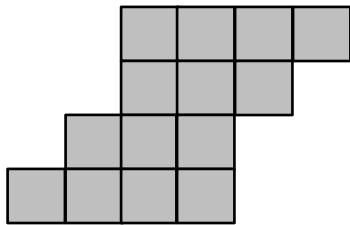
 - b. What is the unknown side length? Show your work, or explain how you know.

 - c. Katy and Jane build a square fence around the castle's pool. It has a perimeter of 36 feet. What is the area that the fence encloses? Use a letter to represent the unknown. Show your work.

2. Each shape has a missing side length labeled with a letter. The perimeter of the shape is labeled inside. Find the unknown side length for each shape.



3. Suppose each  is 1 square centimeter.



a. Find the area and perimeter of each shape.

b. John says, “If two shapes have the same area, they must also have the same perimeter.” Is John correct? Use your answer from Part (a) above to explain why or why not.

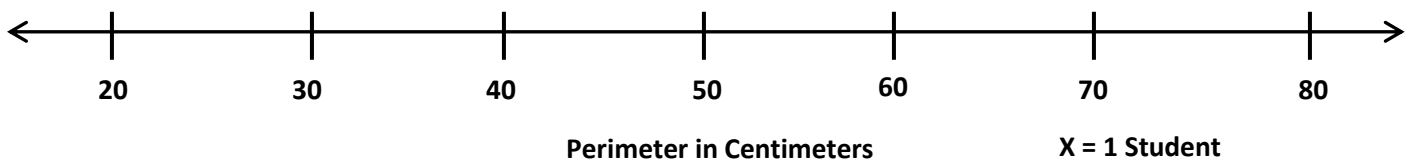
4. Mr. Jackson’s class finds all possible perimeters for a rectangle composed of 36 centimeter tiles. The chart below shows how many students found each rectangle.

Perimeter	Number of Students
24 cm	6
26 cm	9
30 cm	5
40 cm	7
74 cm	4

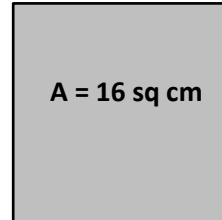
- a. Check the students’ work. Did they find all the possible perimeters? How do you know?

- b. Use the chart. Estimate to construct a line plot of how many students found each perimeter.

Number of Students Who Found Each Perimeter



5. The square to the right has an area of 16 square centimeters.
- a. What is the length of each side? Explain how you know.



- b. Draw copies of the square to make a figure with a perimeter of 32 centimeters.
- c. Write a number sentence to show that your figure has the correct perimeter of 32 centimeters.

**End-of-Module Assessment Task
Standards Addressed**

Topics A–E

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

- 3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order [Order of Operations].)

Represent and interpret data.

- 3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

- 3.MD.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.

Reason with shapes and their attributes.

- 3.G.1** Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student CAN do now and what they need to work on next.

A Progression Toward Mastery				
Assessment Task Item and Standards Assessed	STEP 1 Little evidence of reasoning without a correct answer. (1 Point)	STEP 2 Evidence of some reasoning without a correct answer. (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)
<p>1</p> <p>3.G.1 3.MD.8 3.OA.8</p>	<p>Student may or may not answer any questions correctly. Strategy or reasoning in Parts (b) and (c) is inappropriate for the problem.</p> <p>OR</p> <p>Student may answer questions correctly, but student work or reasoning is missing entirely from Parts (b) or (c).</p>	<p>Student answers at least two questions correctly. Strategy or reasoning in Parts (b) and (c) may be unclear.</p>	<p>Parts (a) and (b) are completely correct. There may be a calculation error in Part (c), but work demonstrates strategy or reasoning appropriate to the problem.</p>	<p>Student correctly:</p> <ul style="list-style-type: none"> a. Draws and labels a diagram with a letter to represent the unknown length. b. Finds 34 feet and shows with equations (e.g., $16 + 16 + 34 + b = 100$, $100 - 66 = 34$ ft) or written explanation (e.g., the shape is a rectangle because opposite sides of a rectangle are equal, so the missing side must be 34 feet) how they know the missing side length. c. Answers 81 sq ft. Work demonstrates strategy or reasoning appropriate to the problem (e.g., all four sides of a square are equal, so the sides can be found using $36 \div 4 = 9$. $9 \times 9 = 81$).
<p>2</p> <p>3.MD.8</p>	<p>Student may calculate the missing side length of one or no shapes correctly.</p>	<p>Student correctly calculates the missing side length for two or three shapes.</p>	<p>Student correctly calculates the missing side length for at least four shapes.</p>	<p>Student correctly answers 6 cm as the missing side length for each shape.</p>



A Progression Toward Mastery				
<p>3</p> <p>3.MD.8</p>	<p>Student is unable to answer either part of the question correctly.</p>	<p>Student makes an error in calculating either area or perimeter in Part (a) that makes the example unhelpful for explanation in Part (b).</p> <p>OR</p> <p>Student may or may not calculate Part (a) correctly. In Part (b), the explanation is unspecific and may simply state that Part (a) proves John is wrong.</p>	<p>Student answers Part (a) correctly, and identifies that John is incorrect in Part (b), but the explanation may specifically mention area or perimeter.</p>	<p>Student correctly:</p> <ol style="list-style-type: none"> Finds 14 sq cm as the area of each shape, and perimeters of 20 cm and 18 cm. Identifies that John is not correct. Explanation includes the argument that area is based on total square units and stays constant as long as the total stays the same, but when square units are rearranged more sides may be exposed, which can change the perimeter.
<p>4</p> <p>3.MD.4</p> <p>3.MD.8</p>	<p>Student is unable to answer any part of the question completely correctly.</p>	<p>Student:</p> <ol style="list-style-type: none"> Attempts to find perimeters, but makes errors in calculation. Provides an unclear or no explanation. Completed line plot correctly based on the chart. 	<p>Student completes all parts of the question correctly, but may provide an unclear explanation in Part (a).</p>	<p>Student correctly:</p> <ol style="list-style-type: none"> Finds all the possible perimeters as 24 cm, 26 cm, 30 cm, 40 cm, and 74 cm. Explanation is appropriate to the problem (e.g., includes finding the factors of 36 and then drawing rectangles with corresponding perimeters and referencing with the chart). Correctly plots the number of students on the line plot.
<p>5</p> <p>3.G.1</p> <p>3.MD.8</p>	<p>Student is unable to answer any question correctly.</p>	<p>Student answers at least one question correctly.</p>	<p>Student answers at least two questions correctly.</p>	<p>Student correctly:</p> <ol style="list-style-type: none"> Answers 4 cm. Explanation includes that a square has four equal sides. Draws a figure with a perimeter of 32



A Progression Toward Mastery

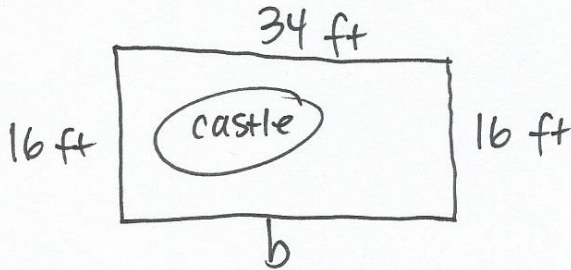
				<p>centimeters, e.g., draws three connected squares in a row. (There are many different ways it can be drawn.)</p> <p>c. Writes $8 \times 4 = 32$, $4 \times 8 = 32$, $32 \div 4 = 8$ or a repeated addition sentence.</p>
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Name Gina

Date _____

1. Katy and Jane construct a four-sided wall to surround their castle. The wall has a perimeter of 100 feet. One side measures 16 feet. A different side measures 16 feet. A third side measures 34 feet.

a. Draw and label a diagram of the wall. Use a letter to represent the unknown side length.



b. What is the unknown side length? Show your work, or explain how you know.

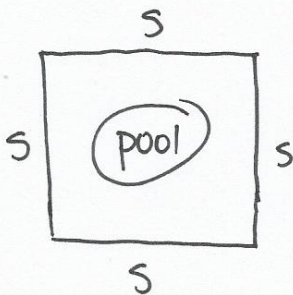
$$34 + 16 + 16 + b = 100$$

$$100 - 66 = 34$$



The unknown side length is 34 feet.

c. Katy and Jane build a square fence around the castle's pool. It has a perimeter of 36 feet. What is the area that the fence encloses? Use a letter to represent the unknown. Show your work.



$$P = 36 \text{ ft}$$

All 4 sides are equal, so

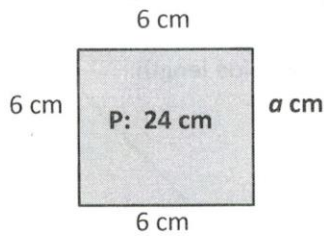
$$36 \div 4 = s$$

$$s = 9$$

$$\begin{aligned} \text{Area} &= 9 \text{ ft} \times 9 \text{ ft} \\ &= 81 \text{ sq ft} \end{aligned}$$

The area inside the fence is 81 square feet.

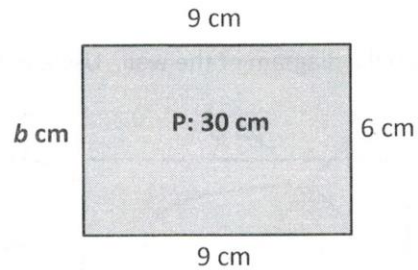
2. Each shape has a missing side length labeled with a letter. The perimeter of the shape is labeled inside. Find the unknown side length for each shape.



$$6 + 6 + 6 = 18$$

$$18 + a = 24$$

$$a = 6 \text{ cm}$$

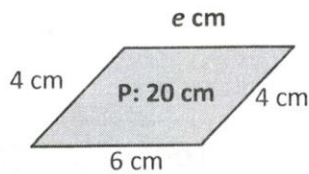


$$9 + 9 = 18$$

$$18 + 6 = 24$$

$$24 + b = 30$$

$$b = 6 \text{ cm}$$

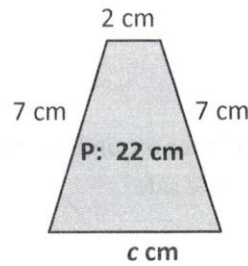


$$4 \times 2 = 8$$

$$8 + 6 = 14$$

$$14 + e = 20$$

$$e = 6 \text{ cm}$$

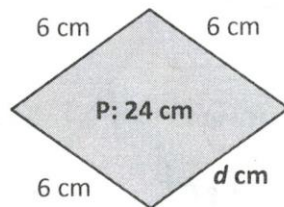


$$7 \times 2 = 14$$

$$14 + 2 = 16$$


$$16 + c = 22$$

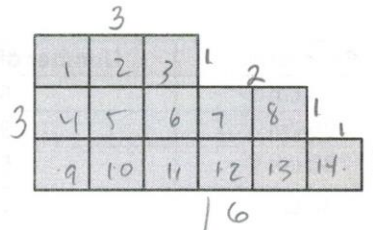
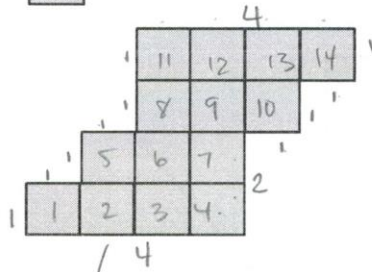
$$c = 6 \text{ cm}$$



$$6 \times 4 = 24, \text{ so}$$

$$d = 6 \text{ cm!}$$

3. Suppose each  is 1 square centimeter.



a. Find the area and perimeter of each shape.

$$A = 14 \text{ sq cm}$$

$$10 + 8 + 2 = 20$$

$$P = 20 \text{ cm}$$

$$A = 14 \text{ sq cm.}$$

$$6 + 4 + 2 + 6 \rightarrow 6 \times 3 = 18$$

$$P = 18 \text{ cm.}$$

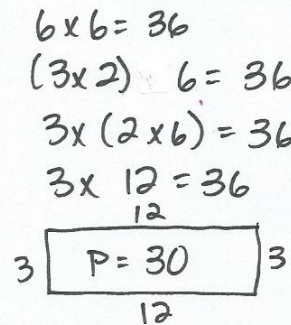
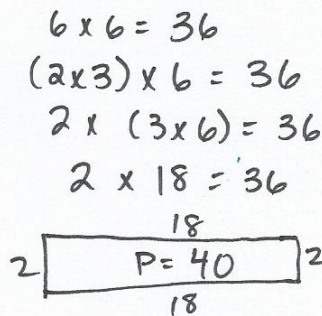
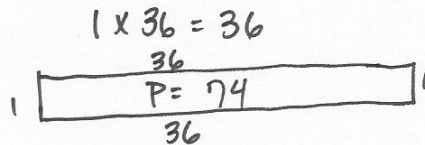
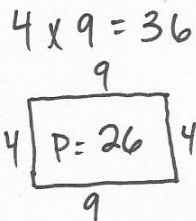
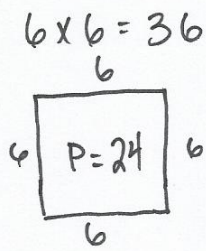
b. John says, "If two shapes have the same area they must also have the same perimeter." Is John correct? Use your answer from Part 3(a) to explain why or why not.

John is not correct. The 2 shapes above have the same area, but not the same perimeter. The reason is that the shapes are made of the same number of squares (area), but they got rearranged for each shape. Sometimes when you rearrange you might have more or less sides showing, and that changes perimeter.

4. Mr. Jackson’s class finds all possible perimeters for a rectangle composed of 36 centimeter tiles. The chart below shows how many students found each rectangle.

Perimeter	Number of Students
24 cm ✓	6
26 cm ✓	9
30 cm ✓	5
40 cm ✓	7
74 cm ✓	4

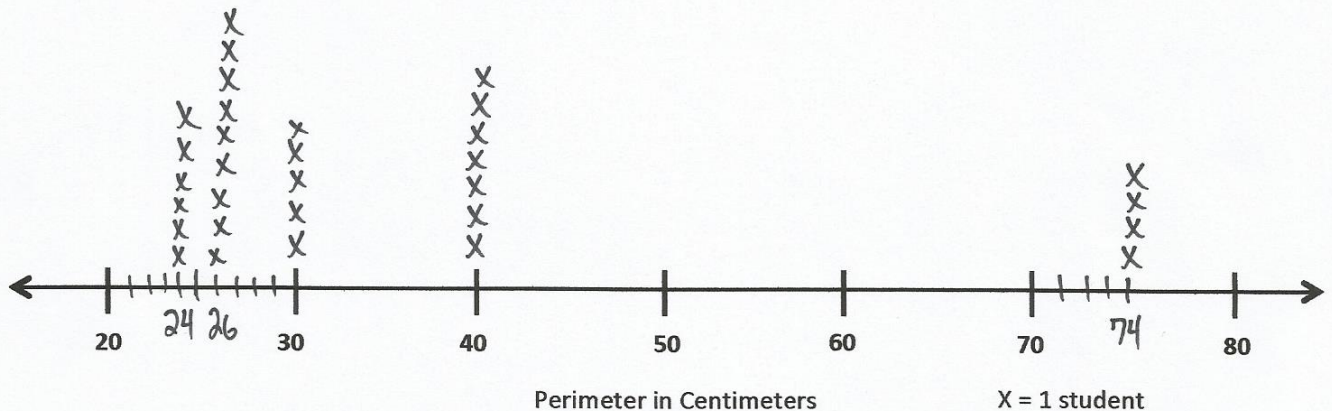
- a. Check the students’ work. Did they find all the possible perimeters? How do you know?



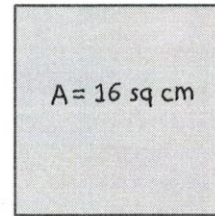
Yes, they found all the perimeters. I know because I used a fact I knew to help me find other side lengths. Then I found the perimeters and checked with the chart.

- b. Use the chart. Estimate to construct a line plot of how many students found each perimeter.

Number of Students Who Found Each Perimeter



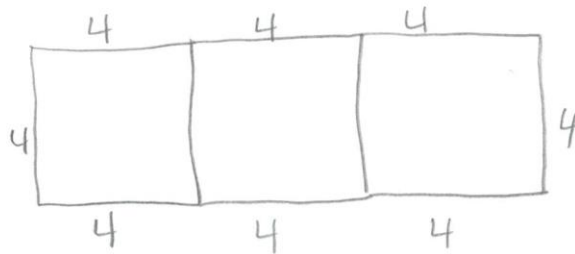
5. The square to the right has an area of 16 square centimeters.
- a. What is the length of each side? Explain how you know.



Each side is 4 cm. If its a square then all sides are equal.

$$\text{So } 16 \div 4 = 4.$$

- b. Draw copies of the square to draw a figure with a perimeter of 32 centimeters.



$32 \div 4 = 8.$
I need 8 sides.

- c. Write a number sentence to show that your figure has the correct perimeter of 32 centimeters.

$$4 \times 8 = 32$$