Just In Time Quick Check
Standard of Learning (SOL) 6.7c

Strand: Measurement and Geometry

Standard of Learning (SOL) 6.7c
The student will solve problems, including practical problems, involving area and perimeter of triangles and rectangles.

Grade Level Skills:
- Solve problems, including practical problems, involving area and perimeter of triangles and rectangles.

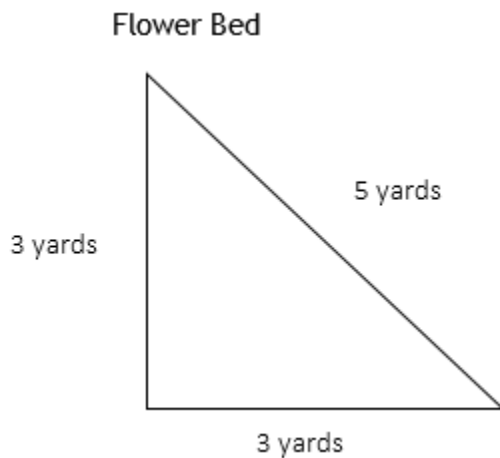## Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:
- VDOE Mathematics Instructional Plans (MIPS)
  - 6.7c - Practical Problems Involving Area and Perimeter (Word) / PDF Version
- VDOE Word Wall Cards: Grade 6 (Word) | (PDF)
  - Perimeter
  - Area
- VDOE Rich Mathematical Tasks: Designing a Dog Park Task (Includes circles as an extension)
  - 6.7 Designing a Dog Park Task Template (Word) / PDF Version
  - 6.7 Designing a Dog Park Student Version of Task (Word) / PDF Version
  - 6.7 Designing a Dog Park Anchor Papers (Word) / PDF Version
  - 6.7 Designing a Dog Park Anchor Papers Scoring Rationales (Word) / PDF Version

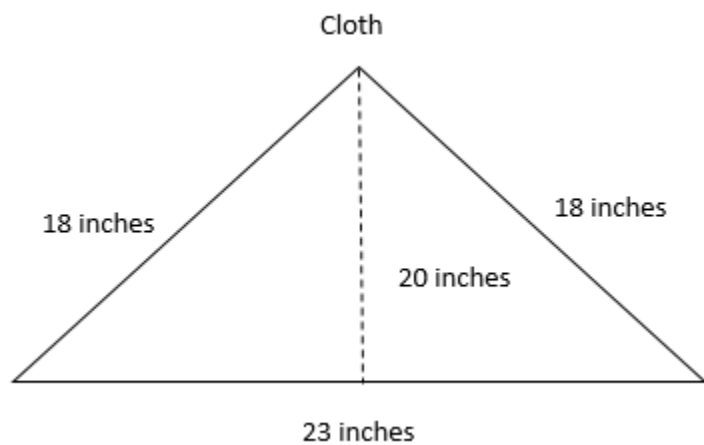**Supporting and Prerequisite SOL:** 5.8a, 5.8b, 4.7, 4.12

SOL 6.7c - Just in Time Quick Check

1. Jeff is building a rectangular pen for his chicken. The length of the pen is 12 feet and the width is 10 feet.

   a) What is the area of this pen?

   b) How many feet of fence will he need to build this pen?

2. Enrique has a square shaped picture frame. The perimeter of the frame is 20 inches and the area is 25 in^2. What is the length of each side of the frame?

3. Tana wants to paint one wall in her house. The wall is 14.5 feet long and 12 feet high. She has enough paint to cover 170 square feet. Will she have enough paint to cover the wall? Explain your answer.

4. Laura is building a flower bed in the shape of a triangle. She drew the plan below. She needs to build a border around the flower bed. She needs to buy enough mulch to cover the area of the flower bed.

   a) How long is the border around the flower bed?
   b) How many square feet will need to be covered by mulch?

   Flower Bed

5. Matt has a triangular shaped piece of cloth to use for small flags. He needs 80 square inches of cloth for each small flag. How many flags can he make with his triangular shaped piece of cloth?

Cloth

18 inches

18 inches

20 inches

23 inches

SOL 6.7c - Just in Time Quick Check Teacher Notes
Common Errors/Misconceptions and their Possible Indications

1. Jeff is building a rectangular pen for his chicken. The length of the pen is 12 feet and the width is 10 feet.

   a) What is the area of this pen?

   b) How many feet of fence will he need to build this pen?

   Students may have difficulty distinguishing between area and perimeter. Some students might reverse the formulas and add all of the sides to find area and multiply the length and width to find the perimeter. To address this misconception, you may wish to use grid paper to show how the perimeter is the distance around the shape and the area is the square units it takes to cover the shape. Using the word wall cards may help in distinguishing between the two terms as well.

   Students might also make the error of adding only two of the sides to find the perimeter. To assist them, use grid paper to draw the shape and label each side correctly. Using the grid paper will help them to see the pairs of congruent sides and that there are four sides to add when finding the perimeter.

   Students commonly use the incorrect units for area vs. perimeter. They will use linear units for area and square units for perimeter. The use of grid paper to physically show the square units for area will be a concrete method of helping students to use the correct units for area.

2. Enrique has a square shaped picture frame. The perimeter of the frame is 20 inches and the area is 25 in^2. What is the length of each side of the frame?

   In working backwards from the area formula, some students have the misconception that thinking about what number squared is the same as dividing by 4. They might use the 25 in^2 for area to find the length of each side as 6.25 in. by dividing the area by 4. This indicates that the students may need more experiences with perfect square numbers in thinking about what the length of one side would be. Utilizing grid paper to draw the square could also assist in finding the side length.

   Another error students may make is looking at the perimeter and deciding that the length and width are each 10 inches. In this case, they are thinking only that you need the length and width to solve these problems and are inadvertently leaving out all four sides in the measurement. Using grid paper to draw the square to the proper area to show the actual measurement of each side as 5 inches will assist with this misconception.

3. Tana wants to paint one wall in her house. The wall is 14.5 feet long and 12 feet high. She has enough paint to cover 170 square feet. Will she have enough paint to cover the wall?

   A student has to infer from the situation that they are finding area. If the student finds the perimeter of the wall, then the student needs more experiences with associating different practical situations with perimeter or area. Additionally, students may correctly find the area of the wall, however, not answer whether she will have enough paint. These students should be encouraged to use a consistent problem solving strategy to ensure their answer is reasonable and that they are answering the question being asked.

4. Laura is building a flower bed in the shape of a triangle. She drew the plan below. She needs to build a border around the flower bed. She needs to buy enough mulch to cover the area of the flower bed.

   a) How long is the border around the flower bed?
   b) How many square feet will need to be covered by mulch?

Flower Bed

3 yards

5 yards

3 yards
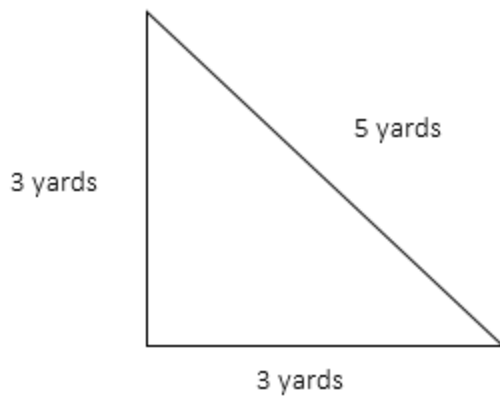
While students might be adept at finding the perimeter and area of squares and rectangles, they may not be as successful with triangles. Understanding which measurements to use as well as understanding how to use the correct formula can be challenging. To help students, use grid paper to redraw the figure and label the sides. Help them to determine the base and height for the given figure. Practice with triangles similar to and different from the one given as the height will look different in non-right triangles. To help them understand why the area of a triangle is half of the area of a rectangle or square, have the student draw rectangles and squares on grid paper and physically cut them or fold them in half to model this formula in a concrete manner.

5. Matt has a triangular shaped piece of cloth to use for small flags. He needs 80 square inches of cloth for each small flag. How many flags can he make with his triangular shaped piece of cloth?

Cloth

18 inches

18 inches

20 inches

23 inches
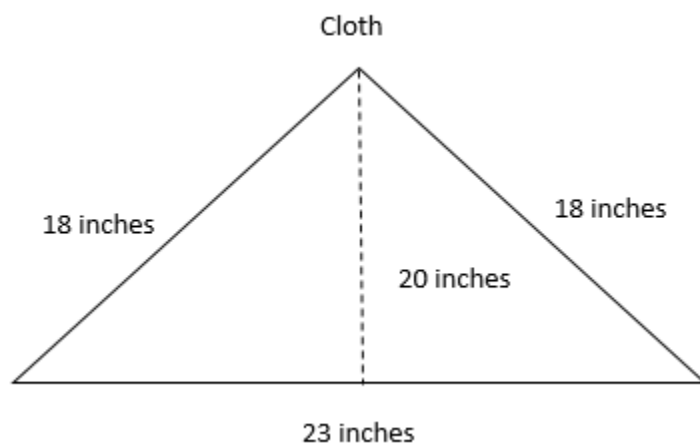
For students having difficulty with understanding why they should multiply the product of the base and height by $\frac{1}{2}$, use grid paper to model that multiplying by $\frac{1}{2}$ is the same as dividing by 2. Students might need a review of multiplying by fractions using a model to refresh and remember this skill.

When determining the number of small flags that can be made with the given material, some students may give an answer of 2.875 or $2\frac{7}{8}$. Review similar division situations with students to help them realize in this situation they will need to focus on the whole number in the quotient to determine the number of small flags that can be made.