Composite Figures: Area and Perimeter

Strand: Measurement and Geometry

Topic: Solving problems involving area and perimeter of composite figures

Primary SOL: 8.10 The student will solve area and perimeter problems, including practical problems, involving composite plane figures.

Materials

- Formulas activity sheet (attached)
- Composite Figures activity sheet (attached)
- Chart paper
- Markers
- Three teacher-created application problems

Vocabulary

area, perimeter, circumference (earlier grades)

composite figures (8.10)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. As a class, complete the Formulas activity sheet.
2. Distribute the Composite Figures activity sheet. Have students work with partners to complete the activity. Provide assistance, as needed.
3. When students have finished, lead a discussion of the processes they used to solve the problems.
4. Next, divide the class into small groups, and give each group three sheets of chart paper, a marker, and a set of the three teacher-created application problems. Have students in each group work together to solve the problems, showing all of their work on the chart paper.
5. When groups have finished, have them display their work. Allow all students to walk around and view the work of all groups to see different approaches to the problems. Have students take notes on their observations.
6. Lead a class discussion on the processes used to solve the problems.

Assessment

- **Questions**
    - How can you find the area of a composite plane figure?
    - How can you find the perimeter of a composite plane figure?

- **Journal/Writing Prompts**
    - Explain why you should divide a composite plane figure into geometric figures when finding the area or perimeter of an irregular figure.
    - Explain to a friend what a composite figure is.
    - Give some real-world examples of jobs and tasks that require this skill.

Extensions and Connections (for all students)

- Have each student create a floor plan for an irregularly shaped bedroom, using various geometric shapes. Then, have students find the areas and perimeters of the different regions of their floor plans in order to find how many square feet of wall-to-wall carpet is needed.
- Have each student create an art design on poster board, using various geometric figures. Then, have students find the areas and perimeters of the different regions of their designs.
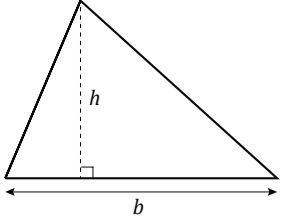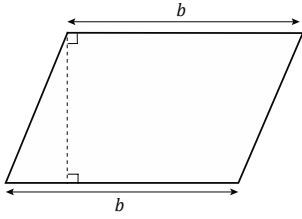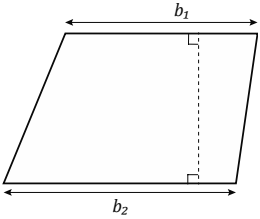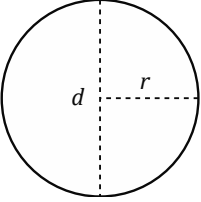
Strategies for Differentiation
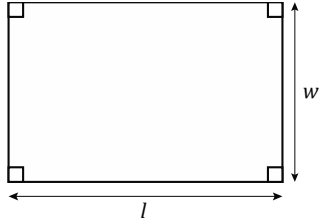
- Have students outline plane figures when finding perimeter
- Have students shade in plane figures when finding area.
- Have students name the shapes they are using and into which they are dividing composite plane figures.
- Before this lesson, review how to find the area and perimeter of a rectangle, square, circle, etc. Include diameter and radius in the review.
- Give students a composite plane figure, and have them cut it into separate geometric shapes. Then, have them find the area of each shape and add the areas together to find the total area, which is the area of the original composite figure.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Formulas

Record the following formulas.

A =	A =	A =	A =	A =
P =	P =	P =	P =	P =

Composite Figures

Name _____ **Date** _____

1. Divide the shape below into two different geometric figures. Draw and name each figure.

Draw figure 1   Draw figure 2

Name _____   Name _____

2. How does separating an irregular, composite figure into various geometric figures help you calculate the perimeter and area of the irregular figure?

3. Draw a new shape that is composed of three different geometric figures. Label each figure you use.

4. Calculate the perimeter and area of the geometric figures shown in the composite figure at right. Round to the nearest tenth. Show all work.

12.5 m

10 m   13.4 m
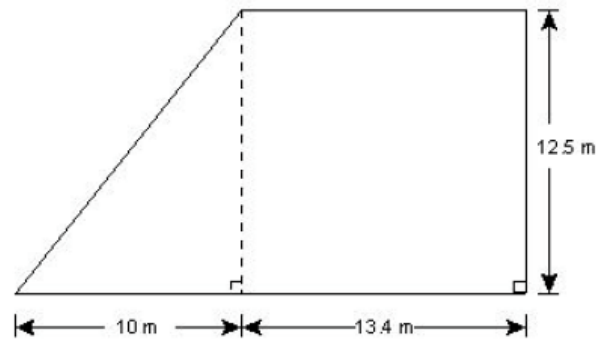
5. Calculate the perimeter and area of the shaded region in the drawing of two circles at right. Round to the nearest tenth. Show all work.
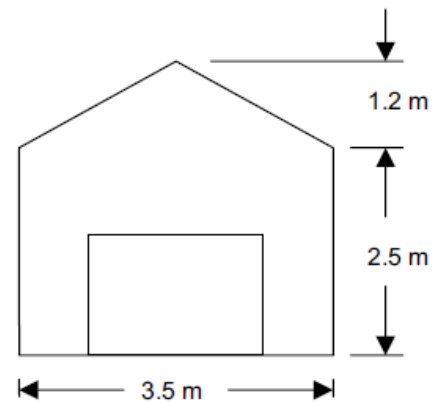
10.5cm

21 cm
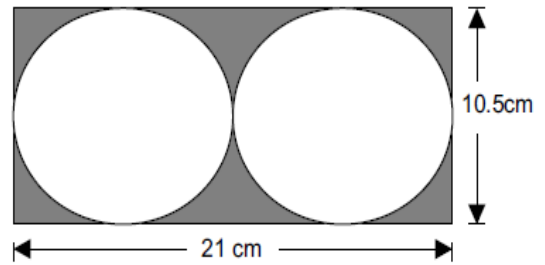
6. Find the area of the shaded region in the drawing of squares at right. Round to the nearest tenth. Show all work.

15 mm

5 mm
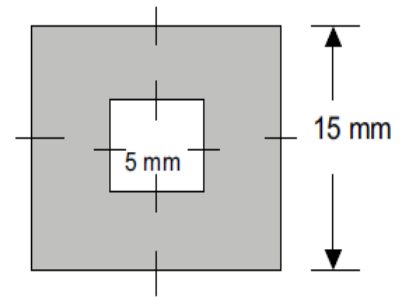
PROBLEM 1

The front of a garage needs to be painted. The total area except for the door will be painted. The door is 1.5 meters high and 2 meters wide.

A. How many square meters of paint will be needed?

1.2 m

2.5 m

3.5 m

B. A can of paint covers 2.5 square meters. How many cans of paint will be needed?

C. A can of paint costs $24.50. How much will it cost to paint the front of the garage?

PROBLEM 2

Joe needs to replace the carpet in his living room and hallway with laminate flooring. A floor plan is shown below.

6 m

3.2 m   Living Room   4.2 m

1.5 m   Hallway
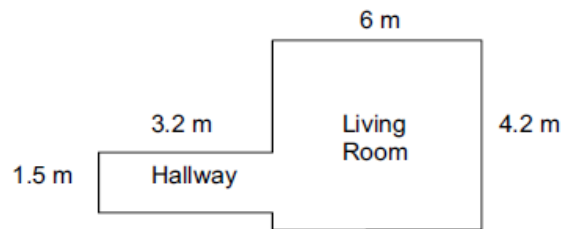
    A. What is total area of floor that needs to be recovered?
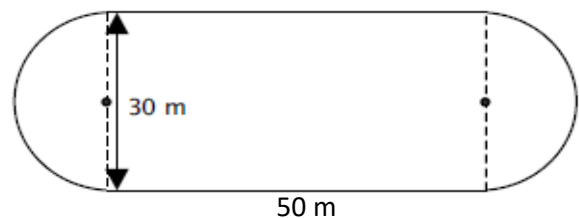
    B. Each box of laminate flooring contains 2.15 square meters of flooring material. How many boxes should Joe buy?

    C. One box costs $42.60. How much will the flooring cost?

    D. If Joe gets a coupon for 20 percent off, how much would the flooring cost?

PROBLEM 3

The school's athletic director wants to seed the field and replace the fence. The field is shown at right.

30 m

50 m

    A. How many meters of fencing will he need to purchase?

    B. How many square meters will need to be seeded with grass seed?

    C. If seeding costs $1.45 per square meter and fencing costs $23.50 per meter, how much will it cost to seed and replace the fence for the field?