

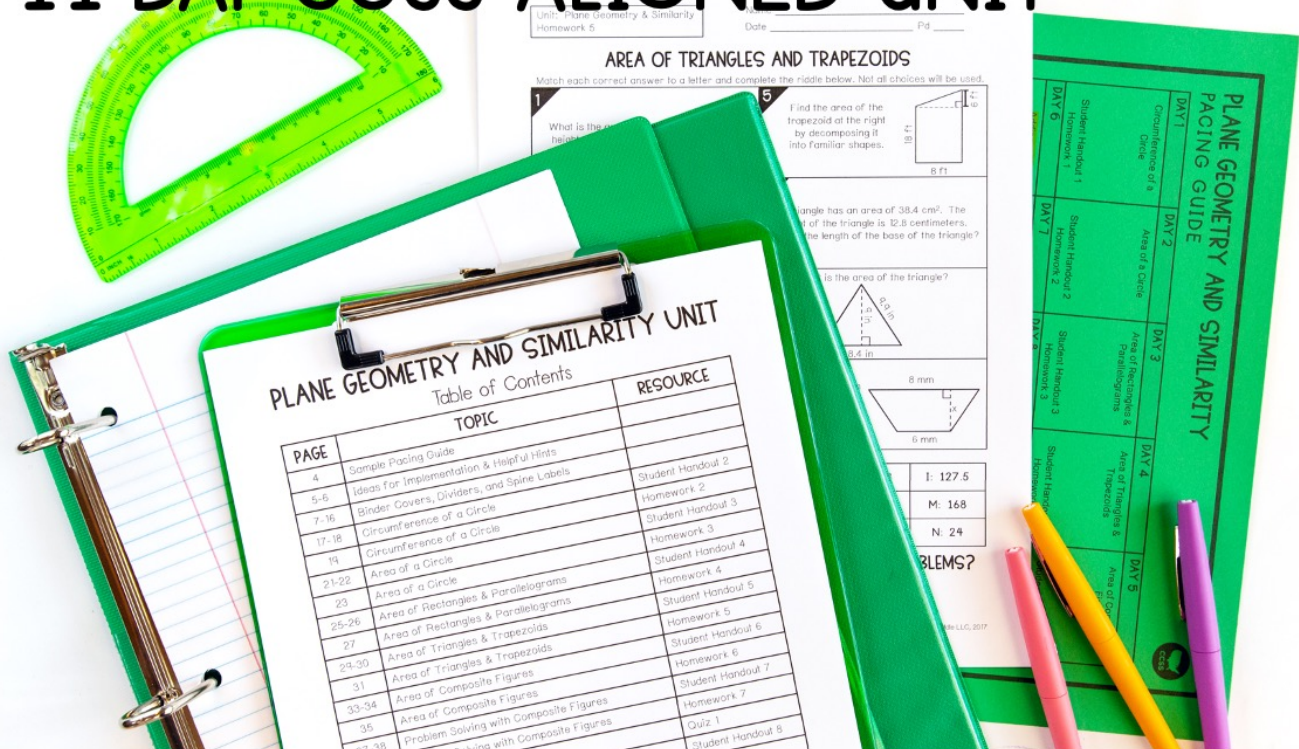
# learning focus:

- ✓ solve problems involving similar shapes and scale drawings
- ✓ determine area and circumference of circles
- ✓ solve mathematical and real-life problems involving composite figures

# PLANE GEOMETRY & SIMILARITY UNIT

**7<sup>th</sup>**  
GRADE

11 DAY CCSS-ALIGNED UNIT



A MANEUVERING THE MIDDLE® RESOURCE

# PLANE GEOMETRY & SIMILARITY



an 11 day CCSS-aligned unit  
CCSS: 7.G.1, 7.G.4, 7.G.6

ready-to-go, scaffolded  
student materials

## PLANE GEOMETRY AND SIMILARITY UNIT

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# PLANE GEOMETRY & SIMILARITY



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## student friendly + real-world application

Unit: Plane Geometry & Similarity  
Student Handout 5

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### AREA OF COMPOSITE FIGURES

Janie and Miguel are painting a mural in the school gymnasium. They will need to paint the entire wall blue except for the circular school logo. How can Janie and Miguel determine how many square feet they will cover in blue paint?

**COMPOSITE FIGURES**

- A \_\_\_\_\_
- We can find the \_\_\_\_\_ of a figure into familiar \_\_\_\_\_

Decompose the figures below. Then, use \_\_\_\_\_

TOTAL AREA \_\_\_\_\_

TOTAL AREA \_\_\_\_\_

a. Discuss the different ways you could determine the area of the figure.

graphic  
organizers

Use your understanding of composite figures to answer the questions below.

- A rectangle is inscribed in a trapezoid. Determine the area of the shaded region.
- A patio is being landscaped with trees and shrubs. How many square feet of landscaping will be around the patio?
- A composite figure is created using a rectangle and a semicircle. What is the area of the figure?

5. Beth and Jena worked the following problem incorrectly. Identify the mistake each made.

**BETH**

$$\frac{1}{2}(16)(12) + (3.14)(16^2) = 96 + 200.96 = 296.96 \text{ units}^2$$

Unit: Plane Geometry & Similarity  
Homework 5

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### AREA OF COMPOSITE FIGURES

Answer the questions below. Be sure to show your thinking.

- A 2 ft by 2 ft square is divided into smaller squares and portions are shaded. What is the area of the shaded portion?
- A garden is sodded in the shaded portion below. How many square feet were covered with sod?

Use the composite figures below to mark each statement as true or false. Justify your choices.

3.

**FIGURE A**

**FIGURE B**

STATEMENT	T/F?	JUSTIFY
a. The area of figure A can be found by determining the sum of the area of the rectangle and the area of a semicircle.		
b. The area of figure B can be found by decomposing the figure into a square and a parallelogram.		
c. Figure B has a total area of 29.75 m <sup>2</sup> .		
d. The area of figure A is 45.99 m <sup>2</sup> more than the area of figure B.		

error  
analysis

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streamline your planning  
process with unit overviews

## PLANE GEOMETRY AND SIMILARITY OVERVIEW



### STANDARDS

- 7.G.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
- 7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationships between the circumference and the area of a circle.
- 7.G.6** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

### BIG IDEAS

- A scale drawing is proportionate.
- A figure can be reduced or enlarged.
- The area of a 2D figure depends on its dimensions.

### ESSENTIAL QUESTION

- Why do different shapes have different areas?
- What is the relationship between area and perimeter?
- How can a formula help you find area?

## PLANE GEOMETRY AND SIMILARITY PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Circumference of a Circle	Area of a Circle	Area of Rectangles & Parallelograms	Area of Triangles & Trapezoids	Area of Composite Figures
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3	Student Handout 4	Student Handout 5
DAY 6	DAY 7			
Problem Solving with Composite Figures	Plane Geometry Quiz			
Student Handout 6 Homework 6	Quiz 1			
DAY 11	NOTES			
Plane Geometry and Similarity Unit Test				
Unit Test				

## PLANE GEOMETRY AND SIMILARITY OVERVIEW



TOPIC	TEACHING TIPS
Circles	<ul style="list-style-type: none"><li>• Collect various circular items and have students practice finding the area and circumference of each item. Consider setting up stations where students use a string or a sewing measurement tape and measure and solve.</li></ul>
Area of Polygons	<ul style="list-style-type: none"><li>• I love teaching area as a covering of a 2D object. This could be as simple as using graph paper to color various shapes with various dimensions. Students could create a picture with various shapes or even spell out their name.</li><li>• Cheez-Its® are also great ways for students to physically cover an object. Consider giving students a specific number of Cheez-Its® and then ask them the various dimensions that can be created with that area.</li></ul>
Composite Figures	<ul style="list-style-type: none"><li>• Consider having students draw the various shapes independent of each other with the measurements. Then, ask them to find the area of each shape. Finally, have them add or subtract based on the situation. By breaking these down into separate images students tend to do better and use the appropriate measurements.</li></ul>
Scale Drawings	<ul style="list-style-type: none"><li>• Project an image onto the board. Then, use the computer to resize the image both by reduction and enlargement. Help students connect the change in size to being proportional.</li><li>• Students can experience a scale drawing by using graph paper and sketching figures, then reducing or enlarging the figures based on the scale factor.</li></ul>

teaching  
ideas

✓ key vocabulary  
✓ vertical alignment

sample  
pacing  
calendar

# PLANE GEOMETRY & SIMILARITY



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## unit study guide + assessments



quizzes



editable unit test

Unit: Plane Geometry & Similarity  
Quiz 1

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

**QUIZ: PLANE GEOMETRY**  
Calculate the area of the shapes below.

1.

2.

3.

Read the problems below. Sketch a picture.

5. A standard size volleyball court has an area of 1,800 square feet. The length of the court is 60 feet. What is the width of the court?

Unit: Plane Geometry & Similarity  
Review

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

**PLANE GEOMETRY AND SIMILARITY UNIT STUDY GUIDE**  
Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

**I CAN USE MODELS AND FORMULAS TO CONNECT AREA AND CIRCUMFERENCE.**

1. Describe how the circumference and the diameter of a circle are related.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Write an equation for the area of the circle.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**I CAN DETERMINE THE CIRCUMFERENCE**

3. A button has a diameter of 4 centimeters. What is the area of the button?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4.

6. The circle in the center of a basketball court is being painted. The circle has a radius of 9 feet. What is the circumference of the circle? Leave your solution in terms of pi.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SEVENTH GRADE CURRICULUM

**PLANE GEOMETRY  
& SIMILARITY**

UNIT SEVEN: ANSWER KEYS

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answer keys  
included

