

Area of Regular Polygons

Lesson 5-4

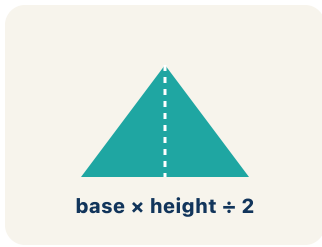
Name: _____

Date: _____

Class: _____

Key Vocabulary Level 2 Standard

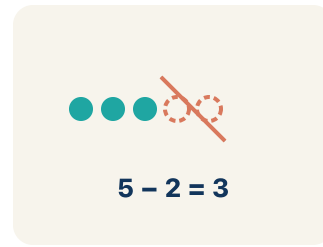
Picture first, then the word, then a plain-language meaning. Say each word out loud.



A stop sign is a regular octagon — all 8 sides are the same length and all 8 angles are equal

Regular Polygon

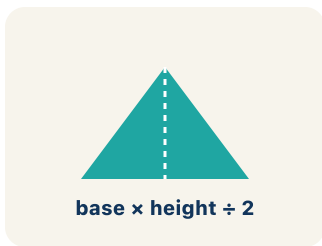
Write the definition:



Draw lines from the center of a hexagon to each corner → you get 6 equal triangles you can find the area of

Decompose

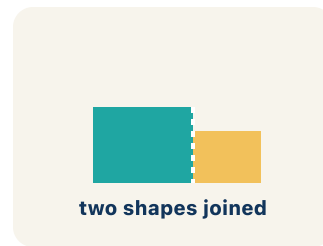
Write the definition:



Each triangle inside a decomposed hexagon has a base = one side of the hexagon and height = distance from center to side

Triangle

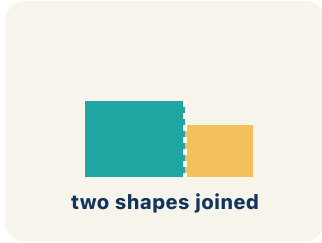
Write the definition:



6 triangles, each with area 15 sq ft, combine to form a hexagon with total area = $6 \times 15 = 90$ sq ft

Composite

Write the definition:



*A house shape = rectangle (walls) + triangle (roof);
find each area, then add them together*

Composite figure

Write the definition:

$$3x + 5$$

no equal sign

For a regular hexagon: Total Area = $6 \times (\frac{1}{2} \times b \times h)$, where b = side length and h = height of each triangle

Formula

Write the definition:

Guided Notes Level 2 Standard



WHAT WE'RE LEARNING TODAY

I can find the area of a regular polygon by decomposing it into triangles.



Fill in each blank as we go. Use the Word Bank to help you.



WORD BANK – FILL EACH BLANK WITH THE BEST WORD

Regular Polygon

Decompose

Triangle

Composite

Composite figure

Formula

👉 Tap any word to see what it means and a picture.

1 A polygon with all sides and all angles equal is a .

2 To break a shape into smaller shapes is to it.

3 A three-sided polygon is a .

4 Made of two or more shapes combined, a figure is .

5 A shape made of two or more basic shapes combined is a

.

6 A math rule written with symbols is a .



Watch & Try – Worked Examples

See the notes in action: watch one worked all the way through, then try the next with the same steps.

 **I do – watch**


Follow each step as your teacher solves it.

Problem: A regular hexagon is divided into 6 equal triangles from the center. Each triangle has a base of 6 ft and a height of 5.2 ft. What is the area of one triangle?

- A. 15.6 sq ft
- B. 31.2 sq ft
- C. 11.2 sq ft
- D. 15.6 ft

Step 1 $A = \frac{1}{2} \times b \times h = \frac{1}{2} \times 6 \times 5.2 = 15.6$ square feet.

 **Answer:** A. 15.6 sq ft

 **We do – together**

Solve this one with your class using the same steps.


Problem: Using the triangle from the previous question, what is the total area of the hexagonal skylight?

- A. 93.6 sq ft
- B. 15.6 sq ft
- C. 187.2 sq ft
- D. 62.4 sq ft

Step 1 _____

Step 2 _____

Answer: _____

 **You do — your turn**

Now try one on your own. Show every step.

Problem: A regular hexagon is split into 6 triangles, each with base 4 cm and height 3.5 cm. What is the total area?

- A. 42 sq cm
- B. 21 sq cm
- C. 84 sq cm
- D. 14 sq cm

Show your work:

Try It

Solve on your own. Check the answer key when you are done.

1. A regular pentagonal tile splits into 5 congruent triangles. Each triangle has a base of 4 in and a height of 6 in. What is the total area of the tile?

- A. 60 in^2
- B. 12 in^2
- C. 24 in^2
- D. 120 in^2

Show your work:

2. A regular octagonal tile is split from its center into congruent triangles. Each triangle has a base of 6 ft and a height of 5 ft. First decide how many triangles an octagon has, then find the total area.

- A. 120 sq ft
- B. 15 sq ft
- C. 90 sq ft
- D. 105 sq ft

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A regular hexagon and a regular pentagon both have triangles with the same base (6 ft) and the same height (5 ft). Which polygon has the greater total area? Explain why the number of sides matters.

Sentence starter: One triangle's area is $\frac{1}{2} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$. The hexagon has $\underline{\hspace{1cm}}$ triangles so its area is $\underline{\hspace{1cm}}$. The pentagon has $\underline{\hspace{1cm}}$ triangles so its area is $\underline{\hspace{1cm}}$. The $\underline{\hspace{1cm}}$ has more area because $\underline{\hspace{1cm}}$.

Show your work:

Reflect — Exit Ticket

A regular pentagon is decomposed into 5 triangles from its center. Each triangle has a base of 7 inches and a height of 4.8 inches. What is the total area of the pentagon?

- A. 84 sq in
- B. 16.8 sq in
- C. 168 sq in
- D. 84 in

Your answer:
