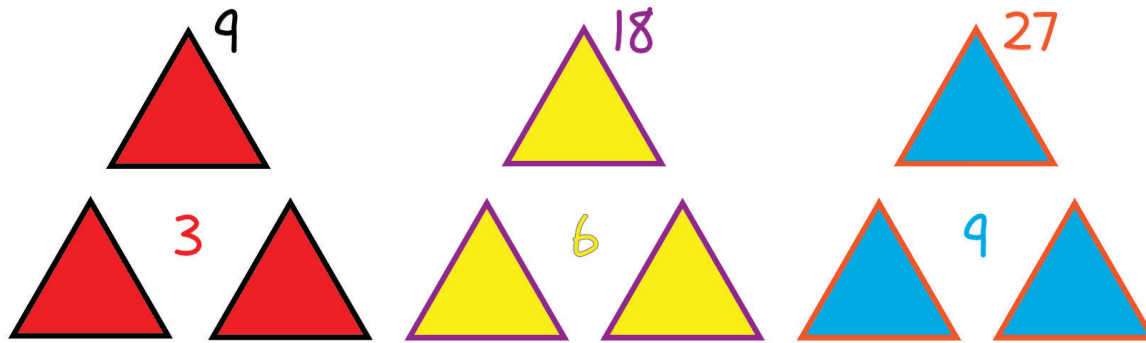


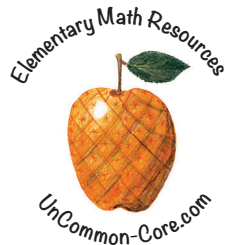
# Multiplication with Geometric Shapes

## FREE SAMPLE!

Nine triangles have 27 sides.



$$9 \times 3 = 27$$



Isabelle Hoag M. Ed.  
Director of Education  
UnCommon-Core.com

Hello Teachers,

Thank you for downloading this handout. After decades of teaching, now I am sharing some of the activities I designed for my students and some new ones as well.

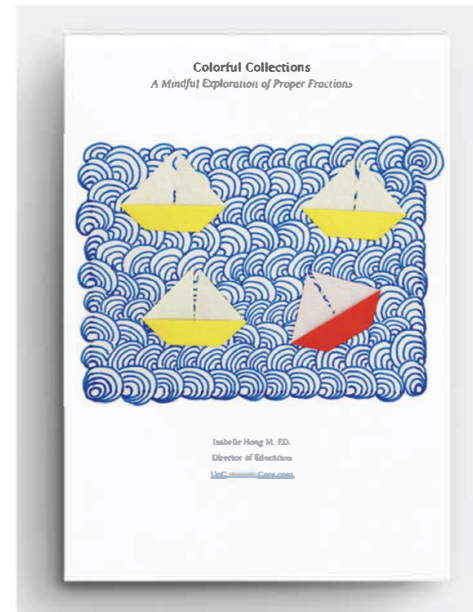
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Thank you again. All the best,

Isabelle

Isabelle Hoag M.Ed.  
Director of Education  
[UnCommon-Core.com](http://UnCommon-Core.com)



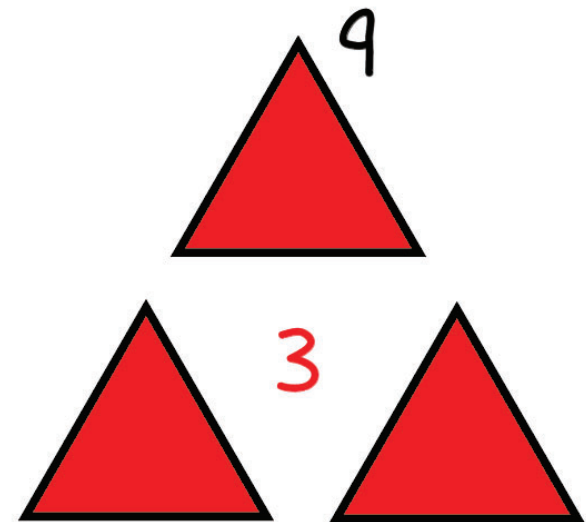
Welcome to Modeling Multiplication with Geometric Shapes. When your students understand the concept of multiplication and can explain it in different ways including as repeated addition, they are ready to use these activities.

There are two versions of each activity. The beginner friendly version is titled: Model Repeated Addition and Multiplication with Shapes. The more conceptual version is titled: Model Multiplication with Geometric Shapes.

Students can place shapes on the page by using stencils or by placing the tracing page under their paper and copying the shape as many times as needed.

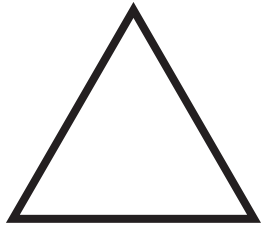
Have students use highlighters to connect their work and the step in which they explain it. This is shown by using different colors on some of the Answer keys.

Encourage students to create images and explanations that make sense to them. Let them review and discuss the work of other students. They will see other ways of thinking about the questions which they might try in their own work.

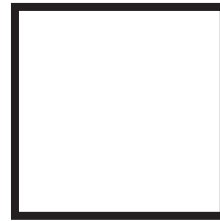


# Geometric Shapes Tracing Page

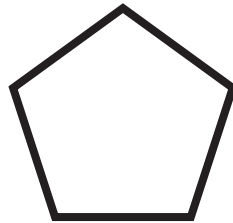
name \_\_\_\_\_



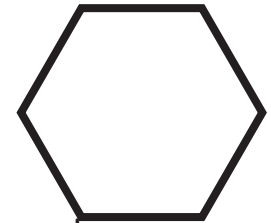
triangle



square



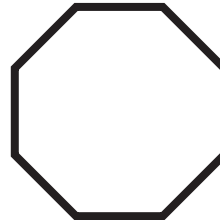
pentagon



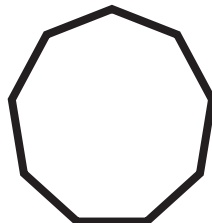
hexagon



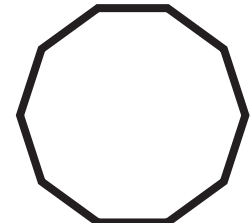
heptagon



octagon



nonagon



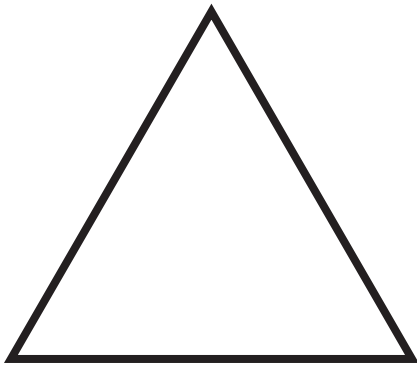
decagon

# Geometric Shapes Vocabulary

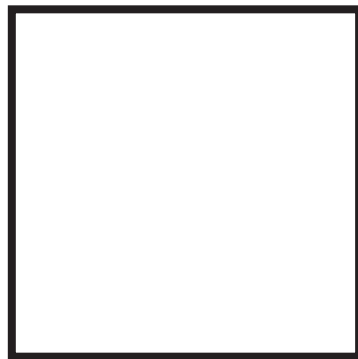
name

**Side:** a line segment between two vertices on a two-dimensional shape

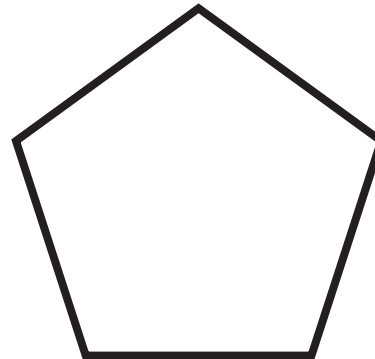
**Vertex, vertices, or vertexes:** a point where line segments meet on a 2D shape



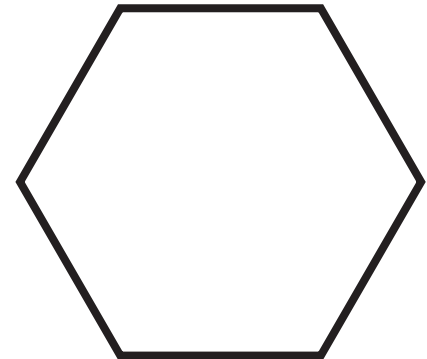
triangle



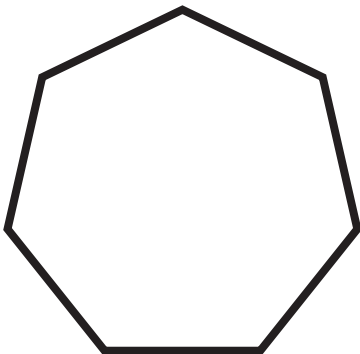
square



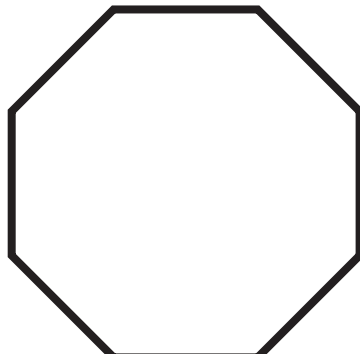
pentagon



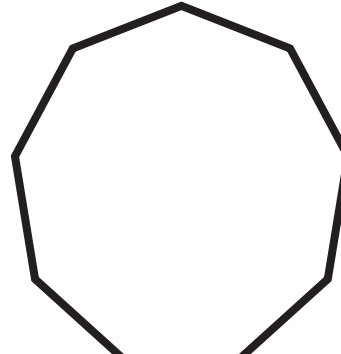
hexagon



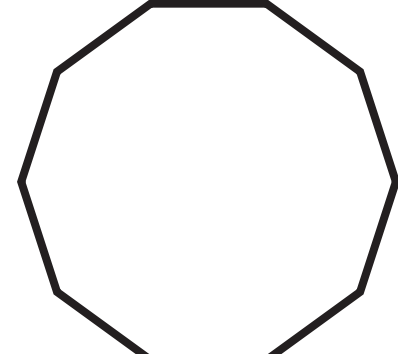
heptagon



octagon



nonagon



decagon

## Geometric Shapes Vocabulary

Use the vocabulary page to answer the questions:

name

How many vertices does a nonagon have?

A heptagon has seven sides; what other two dimensional (2D) shape has seven sides?

The four sides of a square are all the same length; which of the other shapes listed share this property ?

Which shape has two more vertices than a hexagon?

What is the relationship between the number of vertices and the number of sides in each shape listed?

Model Repeated Addition and Multiplication with Shapes  
How many sides on four hexagons?

name

1. Make four hexagons on the page.
2. Identify the number of sides on each hexagon.
3. Add to find the total number of sides.
4. Write a multiplication sentence to answer the question.
5. Explain the steps you used to find the answer.
6. How do you know the answer is correct?

Model Multiplication with Geometric Shapes  
How many sides on four hexagons?

name

1. Create an image to clarify the question.
2. Write the multiplication sentence that answers the question.
3. Explain the steps you used to find the answer.
4. How you know the answer is correct?



Model Repeated Addition and Multiplication with Shapes  
How many sides on nine triangles?

name

1. Make nine triangles on the page.
2. Identify the number of sides on each triangle.
3. Add to find the total number of sides.
4. Write a multiplication sentence to answer the question.
5. Explain the steps you used to find the answer.
6. How do you know the answer is correct?

Model Multiplication with Geometric Shapes  
How many sides on nine triangles?

name

1. Create an image to clarify the question.
2. Write the multiplication sentence that answers the question.
3. Explain the steps you used to find the answer.
4. How you know the answer is correct?

Model Repeated Addition and Multiplication with Shapes  
How many vertices on seven octagons?

name

1. Make seven octagons on the page.
2. Identify the number of vertices on each octagon.
3. Add to find the total number of vertices.
4. Write a multiplication sentence to answer the question.
5. Explain the steps you used to find the answer.
6. How do you know the answer is correct?

Model Multiplication with Geometric Shapes  
How many vertices on seven octagons?

name

1. Create an image to clarify the question.
2. Write the multiplication sentence that answers the question.
3. Explain the steps you used to find the answer.
4. How you know the answer is correct?

## Geometric Shapes Vocabulary

Use the vocabulary page to answer the questions:

Answer Key

How many vertices does a nonagon have?

Answers will vary.

A nonagon has nine vertices.

A heptagon has seven sides; what other two dimensional (2D) shape has seven sides?

The heptagon is the ONLY 2D shape with seven sides.

The four sides of a square are all the same length; which of the other shapes listed share this property ?

All of the shapes listed have sides of equal length.

Which shape has two more vertices than a hexagon?

An octagon has two more vertices than a hexagon.

What is the relationship between the number of vertices and the number of sides in each shape listed?

All of them have the same number of vertices as sides.

Model Repeated Addition and Multiplication with Shapes  
How many sides on four hexagons?

Answer Key

1. Make four hexagons on the page.
2. Identify the number of sides on each hexagon.
3. Add to find the total number of sides.
4. Write a multiplication sentence to answer the question.
5. Explain the steps you used to find the answer.
6. How do you know the answer is correct?

First, I used a stencil to draw four hexagons on the page.

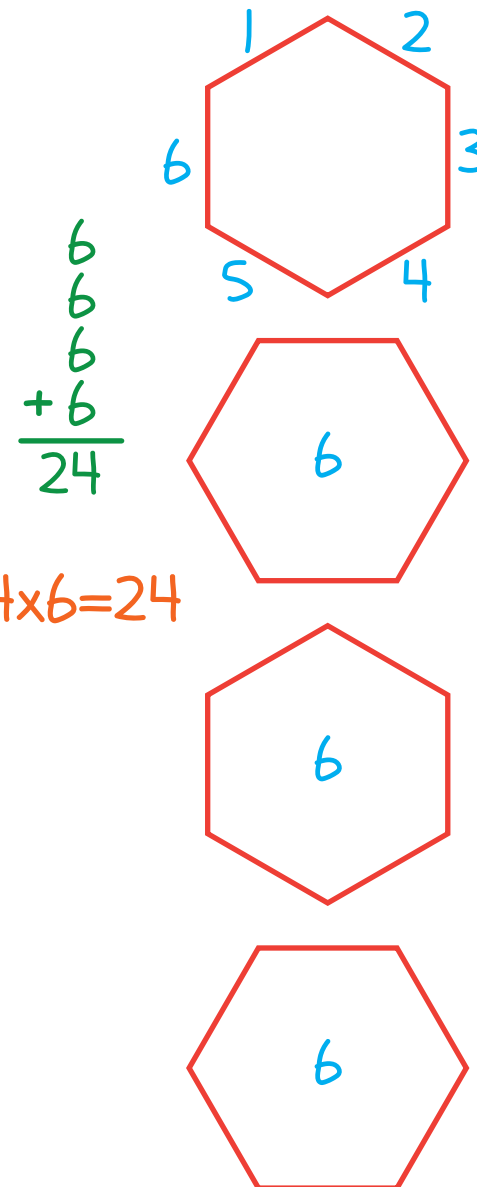
Hexagons have six sides, but I wrote the numbers by the sides of the top hexagon to show that it was six. Since all hexagons are the same, I didn't write more numbers.

Then, I added six to itself four times which is 24.

There were 4 sixes in the addition sentence, so I wrote the multiplication sentence to show that.

I know 24 is the right answer because four groups of six add up to twenty-four. Also, in the addition sentence, I wrote the number 6 four TIMES. Times in math means multiplication.

Image and explanation will vary.



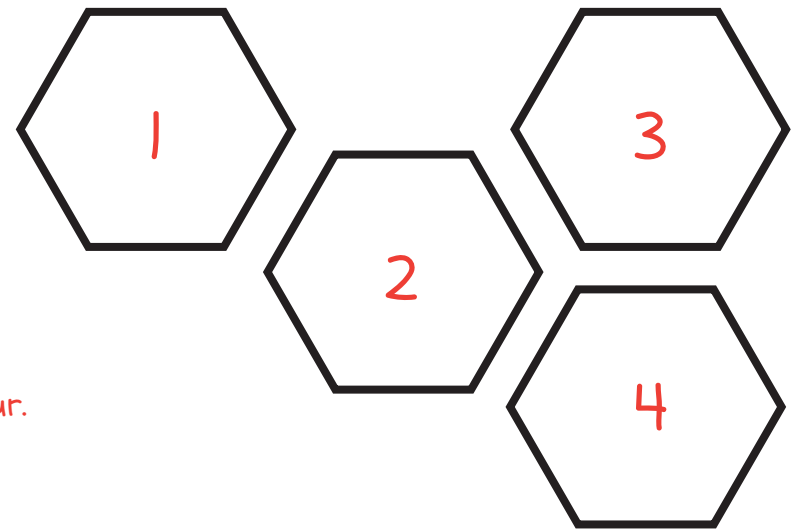
Model Multiplication with Geometric Shapes  
How many sides on four hexagons?

Answer Key

1. Create an image to clarify the question.
2. Write the multiplication sentence that answers the question.
3. Explain the steps you used to find the answer.
4. How you know the answer is correct?

$$4 \times 6 = 24$$

Image and explanation will vary.



First, I put the tracing page under this one and traced four tessellated hexagons. I numbered them to show that there are four.

All hexagons have six sides so the equation that answers the question, 'how many sides on four hexagons?' is  $4 \times 6 = 24$ .

I know 24 is the right answer because I checked the answer by using my multiplication grid. Plus, I know my six and four times tables. I could have counted each side, but I know it is the right answer.

Model Repeated Addition and Multiplication with Shapes  
How many sides on nine triangles?

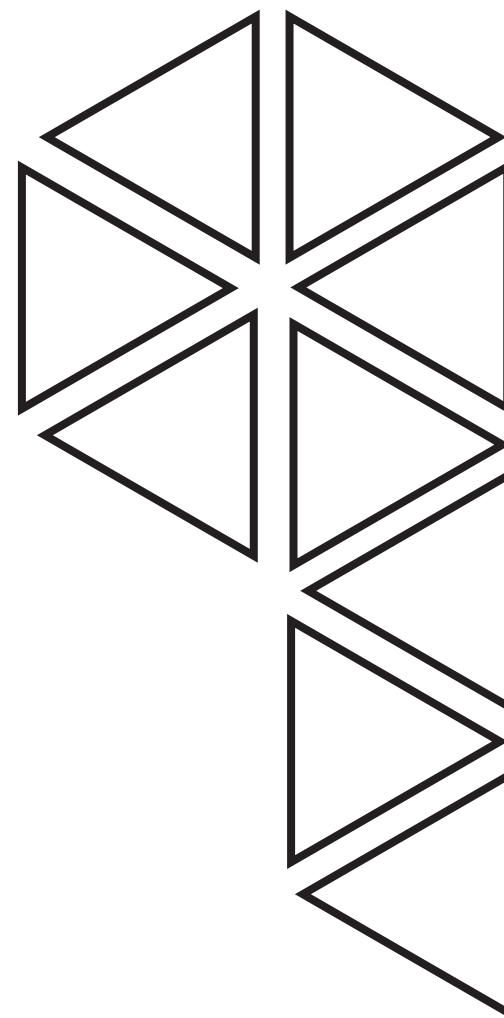
Answer Key

1. Make nine triangles on the page.
2. Identify the number of sides on each triangle.
3. Add to find the total number of sides.
4. Write a multiplication sentence to answer the question.
5. Explain the steps you used to find the answer.
6. How do you know the answer is correct?

$$3+3+3+3+3+3+3+3+3=27$$

$$9 \times 3 = 27$$

Image and explanation will vary.





Model Multiplication with Geometric Shapes  
How many sides on nine triangles?

Answer Key

1. Create an image to clarify the question.
2. Write the multiplication sentence that answers the question.
3. Explain the steps you used to find the answer.
4. How you know the answer is correct?

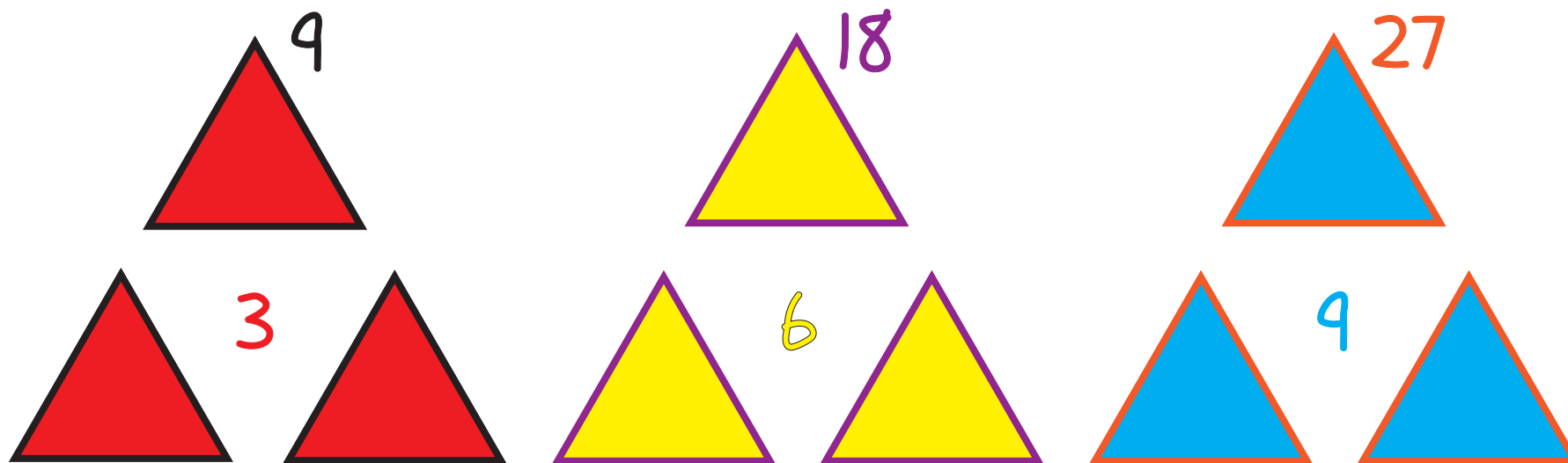
$$9 \times 3 = 27$$

Image and explanation will vary.

The image shows nine triangles in three different colors and in formations of three. Numbers in the center of each formation skip count to show a total of nine triangles. The sides are also shown in three colors and have numbers in matching colors skip count to find the total number of sides.

The multiplication sentence that goes with this picture is nine times three which equals twenty-seven.

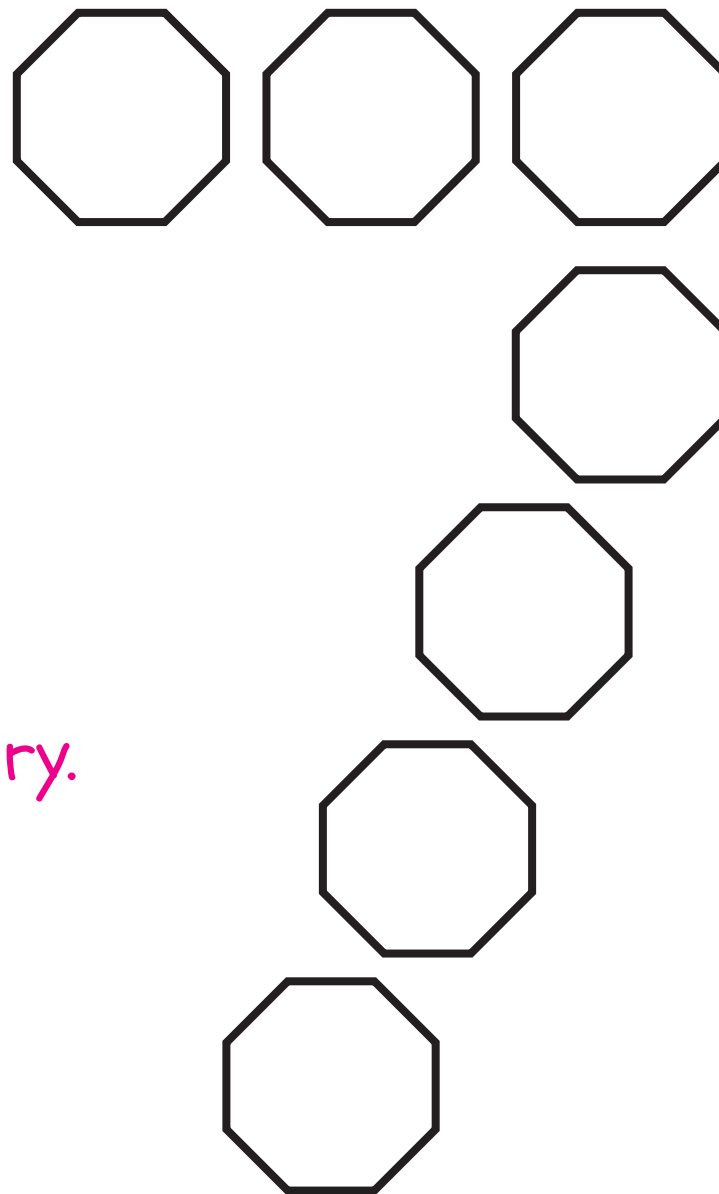
I know the answer is 27 because I counted all the sides on nine triangles. Also, I know that  $9 \times 3$  is 27,  $9 + 9 + 9 = 27$ , and  $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 27$ . Any way you calculate it, nine threes are 27.



Model Repeated Addition and Multiplication with Shapes  
How many vertices on seven octagons?

Answer Key

1. Make seven octagons on the page.
2. Identify the number of vertices on each octagon.
3. Add to find the total number of vertices.
4. Write a multiplication sentence to answer the question.
5. Explain the steps you used to find the answer.
6. How do you know the answer is correct?



$$8+8+8+8+8+8+8=56$$

$$7 \times 8 = 56$$

Image and explanation will vary.

Model Multiplication with Geometric Shapes  
How many vertices on seven octagons?

Answer Key

1. Create an image to clarify the question.
2. Write the multiplication sentence that answers the question.
3. Explain the steps you used to find the answer.
4. How you know the answer is correct?

$$7 \times 8 = 56$$

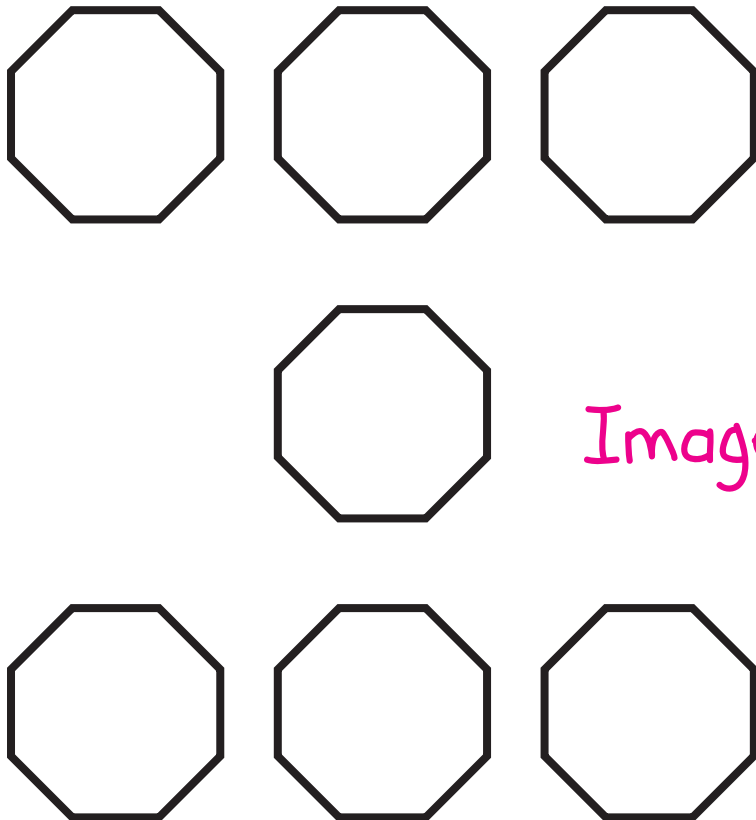


Image and explanation will vary.

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All the best!

*Isabelle*

Isabelle Hoag M. Ed.



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