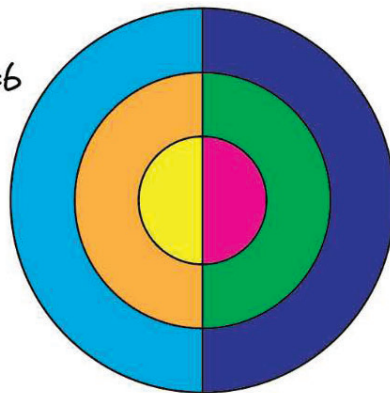
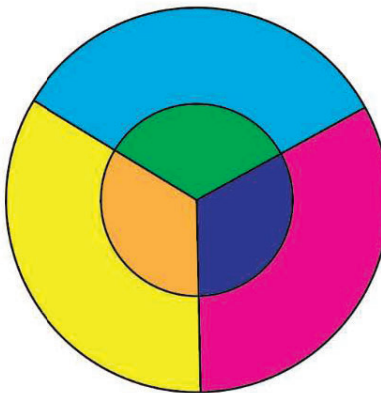


# Concentric Circle Multiplication **FREE SAMPLE!**

$2 \times 3 = 6$



$3 \times 2 = 6$



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.

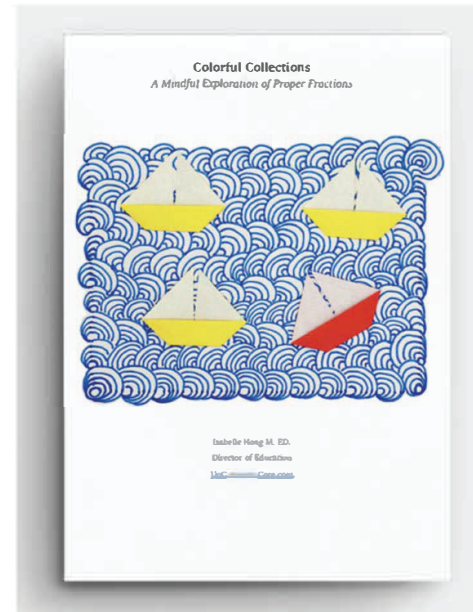
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Also, visit my Teachers Pay Teachers store [UnCommon-Core dot com](http://UnCommon-Core dot com).

Thank you again. All the best,

Isabelle

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



# Concentric Circles Multiplication Teacher Introduction

Teachers!

Have your students been working on multiplication?

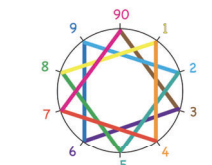
Can they explain multiplication in terms of: equal groups? Skip counting? Repeated addition?

Are they ready for an exciting activity to help them: practice math facts? Consolidate their understanding of multiplication? Make sense of the commutative property of multiplication?

NOT YET?

YES!

### Multiples of Three Choral Counting Slide Show



A Gentle Introduction to Multiples of Three


Students:

- Make the soundtrack
- Gain fluency with math facts
- Explore memorable patterns

Slide Show Includes:

- 3 minutes of choral counting
- Multiples of three: 0 to 120
- [Access to online Teacher Tips](#)

Isabelle Hoag M. Ed.  
Director of Education  
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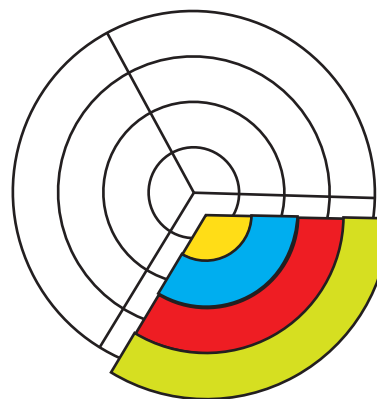
Students who are not yet ready for Concentric Circle Multiplication will enjoy skip counting and the colorful activity that goes with it.

Let me introduce **Concentric Circle Multiplication!**

The activities on each page focus on a unique pair of **factors** and their **product**. There are two circular images; one for each way the factors can be ordered.

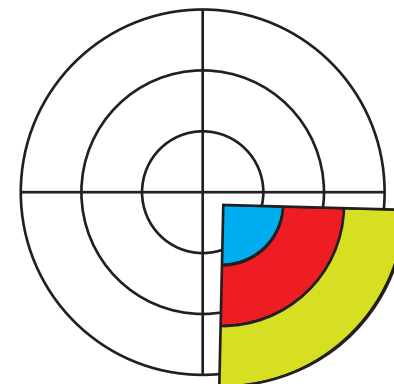
The images show a unique multiplication model in which a **slice** of a **circle** is used as a group. Shapes within each slice are the elements in each group.

The circles are based on a polar grid. Connect the image with a pie chart or an analog clock to give your students everyday references. If any of your students are diabetic, live in food insecure homes, or are fasting for Lent, Yom Kippur, or Ramadan you may not want to compare them to pie, cake, cookies, or pizza.



The image above shows three groups of four. There are three slices with four pieces in each. The total number of pieces is twelve.

$$3 \times 4 = 12$$



This image shows four slices with three pieces in each. There are four groups of three. The total number of pieces is twelve.

$$4 \times 3 = 12$$

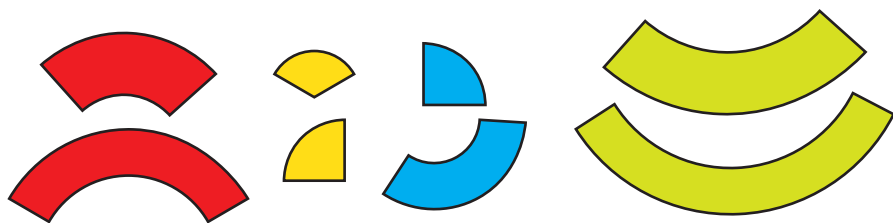


# Concentric Circles Multiplication Teacher Introduction

If your students are familiar with fractions of circles, then that connection will help them compare the size of two slices. If they have learned about degrees, that connection will also help.

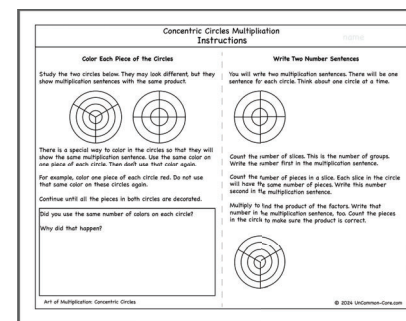
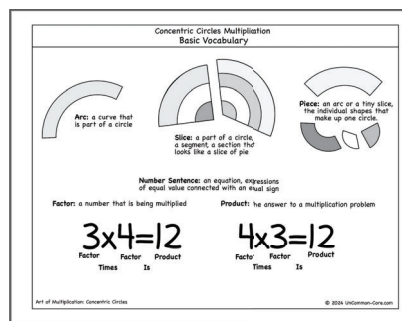


However, even without additional experience with angles or fractions, students can see when one slice takes up more of the circle than another.

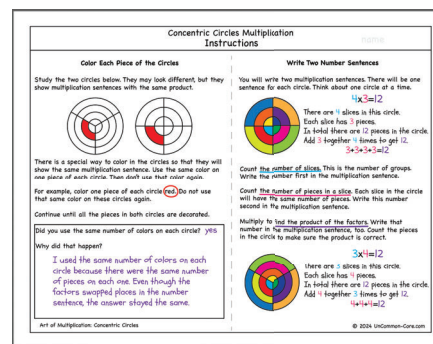


The arcs and little slices – from the center of the circles – are called **pieces**. There are the same number of pieces in each circle. This number matches the product of the factors on that page. It also matches the number of colors used to fill in the pieces of each circle. Consider having students cut out the pieces of both circles and pair them by color.

There are two pages you can use to introduce the activities to your students. The vocabulary page introduces terms that are used in directions. Encourage students to use this page as a reference when they answer questions or write about what they have done.



Next there is an interactive instruction page. Make sure each student understands what to do. The instruction page uses three and four as examples. For this reason, give students the activity page that uses three and four as factors.



# Concentric Circles Multiplication Overview and Vocabulary

## Overview

Using concentric circles and radial dividers to multiply is a fun and colorful alternative to other types of models. This model focuses on the number of pieces created by the dividers.

In these activities slices are like groups. The pieces within each slice are the elements inside the group.

Each arc or tiny slice in a circle should be decorated in a different color. This way, the number of colors used will equal the product of the multiplication problem. Students should use the same colors on both circles in order to make a direct comparison.

The concentric circles and radial dividers look fabulous when decorated in various colors. They also can be seen as an area model of multiplication. Both circles on the page take up the same amount of space. Students can cut out the circles and slide them together to check.

Students can also use the concentric circles to show multiplication as repeated addition. Have them write the total number of pieces in each slice next to the circle. Then they can add to find the total number of pieces.

## Vocabulary:

**Arc:** part of the circumference of a circle, a shape that is part of a hoop or ring

**Circle:** a round shape, a ring, a hoop,

**Commutative property of multiplication:** the order of the factors does not affect the product

**Concentric:** nested, fitting inside each other - having the same center point,

**Equation:** - number sentence, a numerical expression with an equal sign in which both sides have the same value

**Factor:** a number to be multiplied

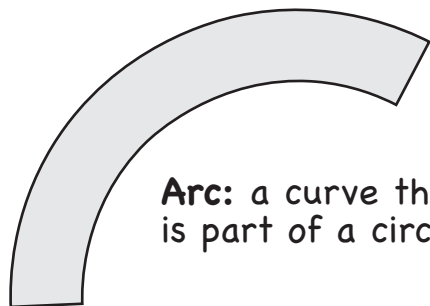
$$\text{factor} \times \text{factor} = \text{product}$$

**Product:** the result of multiplying two factors

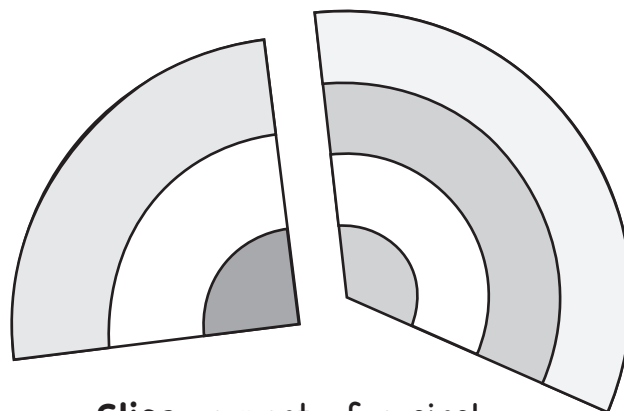
**Slice:** shape that looks like a piece of pie, similar to a triangle however one edge is curved.

# Concentric Circles Multiplication Basic Vocabulary

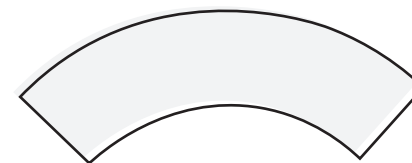
name \_\_\_\_\_



**Arc:** a curve that is part of a circle



**Slice:** a part of a circle, a segment, a section that looks like a slice of pie



**Piece:** an arc or a tiny slice, the individual shapes that make up one circle.



**Number Sentence:** an equation, expressions of equal value connected with an equal sign

**Factor:** a number that is being multiplied

**Product:** the answer to a multiplication problem

$$3 \times 4 = 12$$

Factor      Factor      Product  
Times      Is

$$4 \times 3 = 12$$

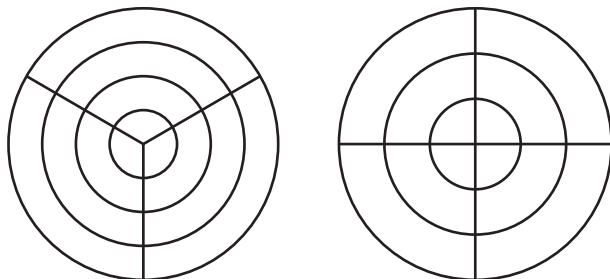
Factor      Factor      Product  
Times      Is

# Concentric Circles Multiplication Instructions

name \_\_\_\_\_

## Color Each Piece of the Circles

Study the two circles below. They may look different, but they show multiplication sentences with the same product.



There is a special way to color in the circles so that they will show the same product. Use the same color on one piece of each circle. Then don't use that color again.

For example, color one piece of each circle red. Do not use that same color on these circles again.

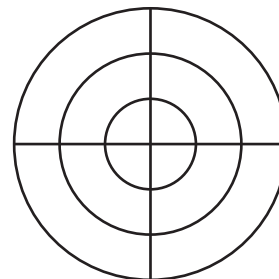
Continue until all the pieces in both circles are filled in.

Did you use the same number of colors on each circle?

Why did that happen?

## Write Two Number Sentences

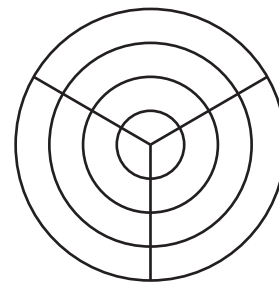
You will write two multiplication sentences. There will be one sentence for each circle. Think about one circle at a time.



Count the number of slices. This is the number of groups. Write the number first in the multiplication sentence.

Count the number of pieces in a slice. Each slice in the circle will have the same number of pieces. Write this number second in the multiplication sentence.

Multiply to find the product of the factors. Write that number in the multiplication sentence, too. Count the pieces in the circle to make sure the product is correct.

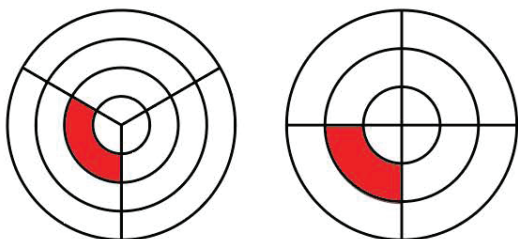


## Concentric Circles Multiplication Instructions

name \_\_\_\_\_

### Color Each Piece of the Circles

Study the two circles below. They may look different, but they show multiplication sentences with the same product.



There is a special way to color in the circles so that they will show the same multiplication sentence. Use the same color on one piece of each circle. Then don't use that color again.

For example, color one piece of each circle red. Do not use that same color on these circles again.

Continue until all the pieces in both circles are decorated.

Did you use the same number of colors on each circle? yes

Why did that happen?

*I used the same number of colors on each circle because there were the same number of pieces on each one. Even though the factors swapped places in the number sentence, the answer stayed the same.*

Art of Multiplication: Concentric Circles

### Write Two Number Sentences

You will write two multiplication sentences. There will be one sentence for each circle. Think about one circle at a time.

$$4 \times 3 = 12$$

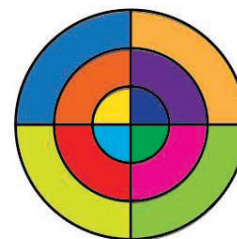
There are 4 slices in this circle.

Each slice has 3 pieces.

In total there are 12 pieces in the circle.

Add 3 together 4 times to get 12.

$$3 + 3 + 3 + 3 = 12$$



Count the number of slices. This is the number of groups. Write the number first in the multiplication sentence.

Count the number of pieces in a slice. Each slice in the circle will have the same number of pieces. Write this number second in the multiplication sentence.

Multiply to find the product of the factors. Write that number in the multiplication sentence, too. Count the pieces in the circle to make sure the product is correct.

$$3 \times 4 = 12$$

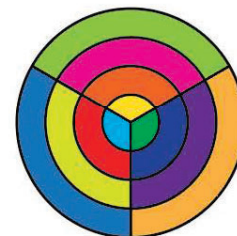
There are 3 slices in this circle.

Each slice has 4 pieces.

In total there are 12 pieces in the circle.

Add 4 together 3 times to get 12.

$$4 + 4 + 4 = 12$$



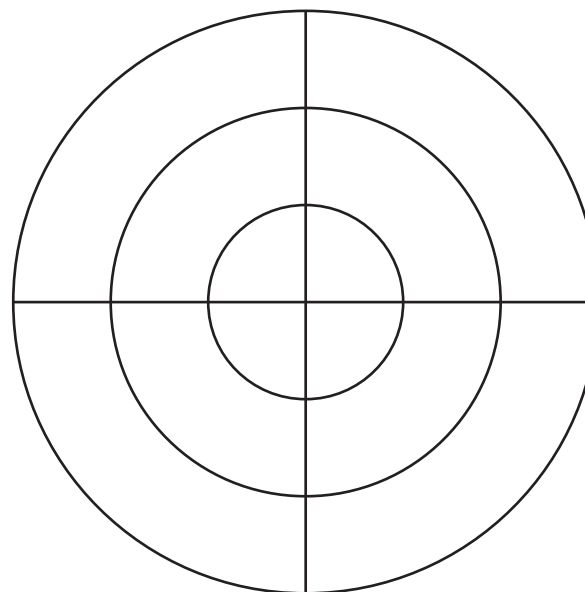
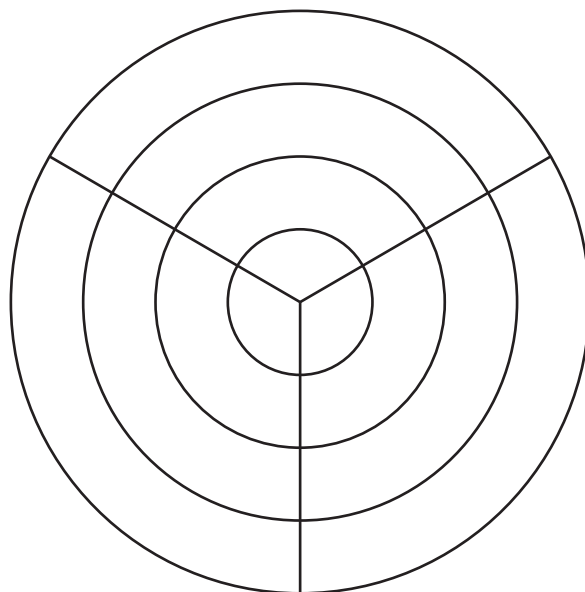
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Concentric Circles Multiplication  
Factors: Three and Four

name

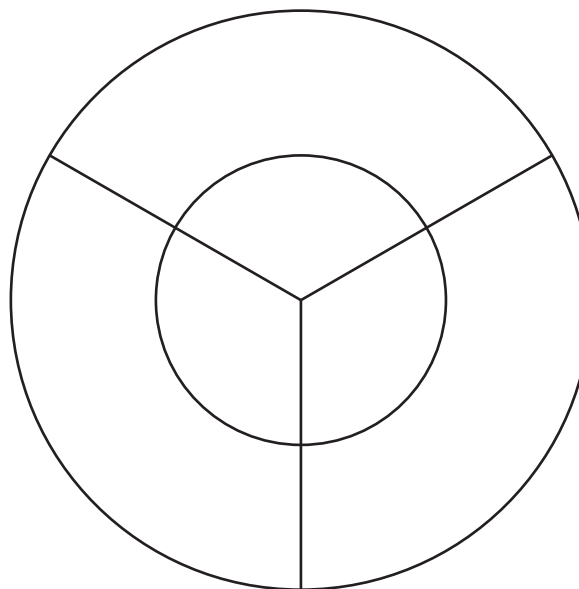
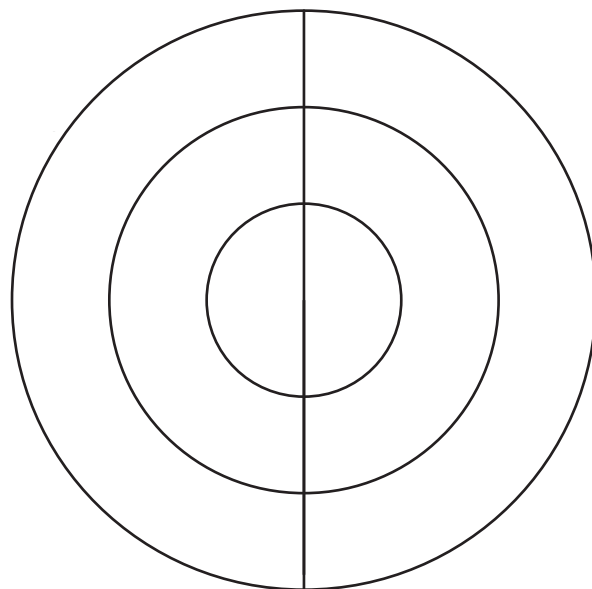
1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.



Concentric Circles Multiplication  
Factors: two and three

name

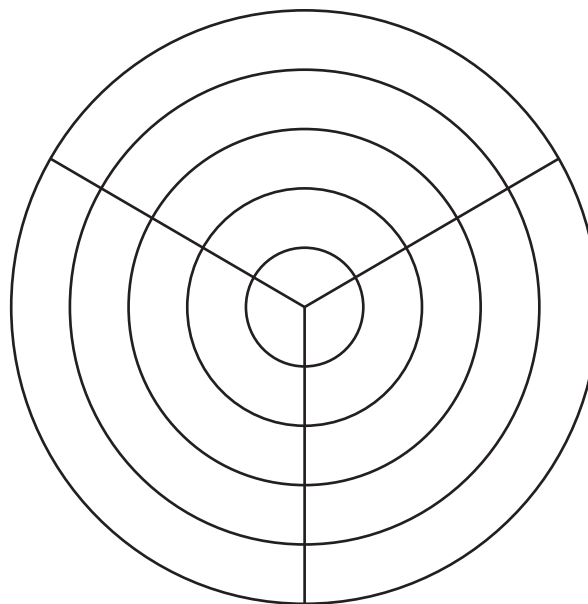
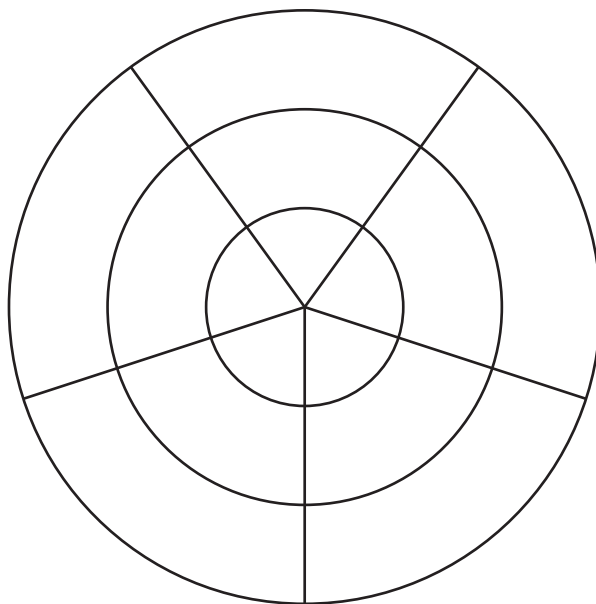
1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.



Concentric Circles Multiplication  
Factors: Three and Five

name

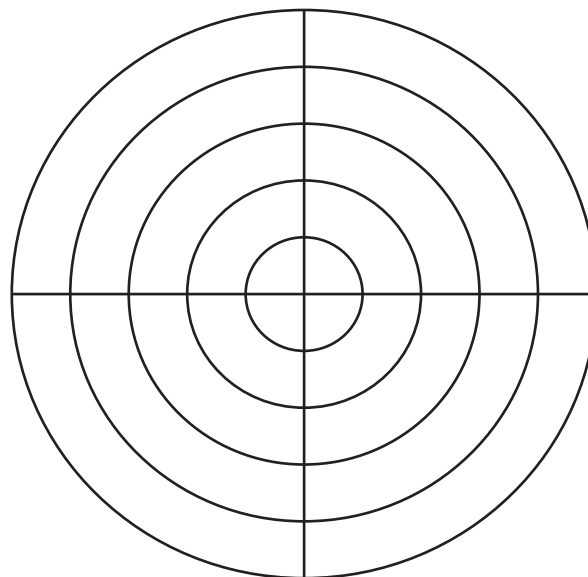
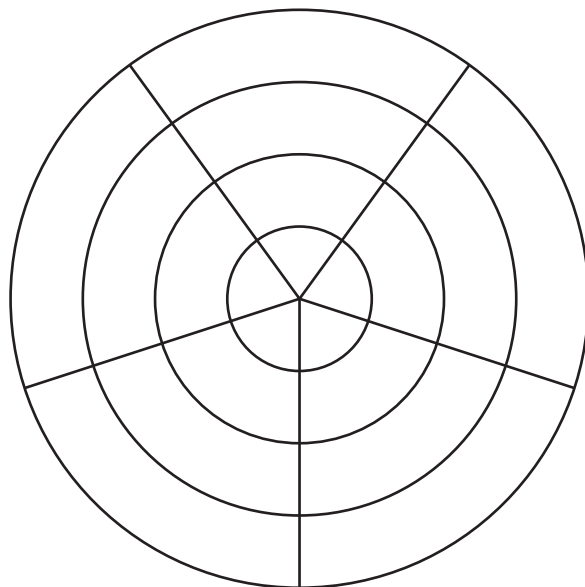
1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.



# Concentric Circles Multiplication Factors: Four and Five

name \_\_\_\_\_

1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.

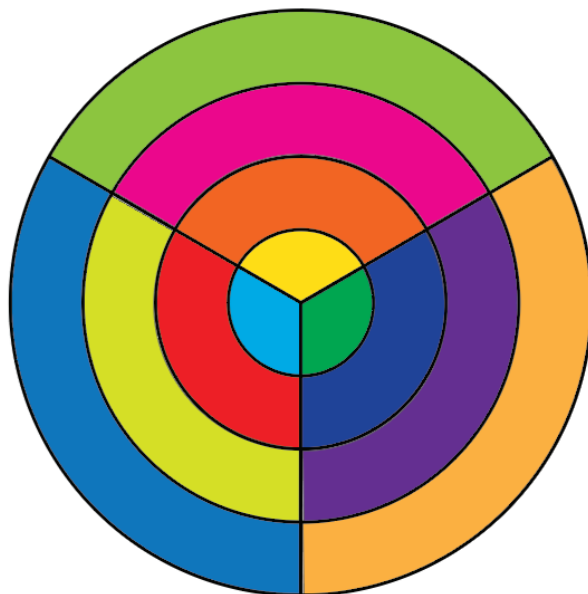


Concentric Circles Multiplication  
Factors: Three and Four

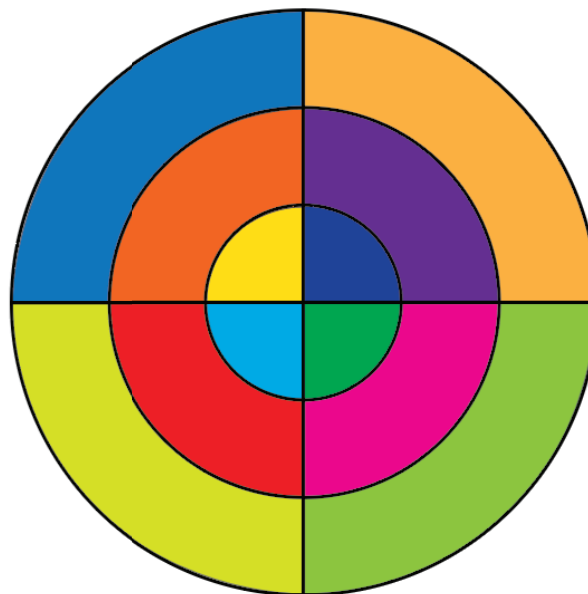
Answer Key

1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.

$3 \times 4 = 12$



$4 \times 3 = 12$



$3 \times 4 = 12$

There are 3 slices in this circle.  
Each slice has 4 pieces.  
In total there are 12 pieces in the circle.  
Add 4 together 3 times to get 12.  
 $4 + 4 + 4 = 12$

Student writing will vary.

$4 \times 3 = 12$

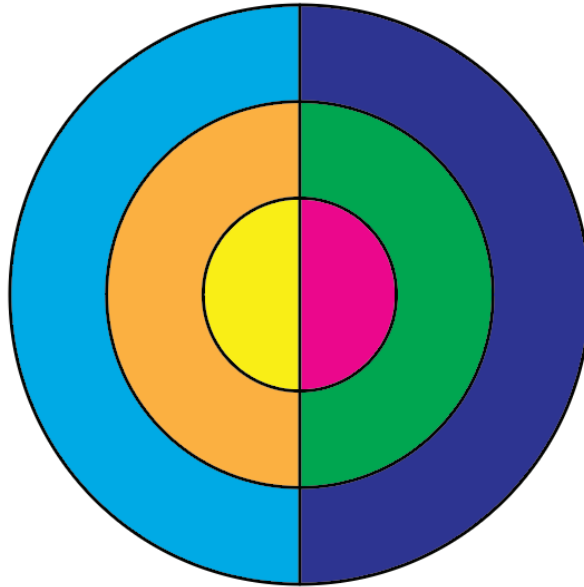
There are 4 slices in this circle.  
Each slice has 3 pieces.  
In total there are 12 pieces in the circle.  
Add 3 together 4 times to get 12.  
 $3 + 3 + 3 + 3 = 12$

Concentric Circles Multiplication  
Factors: two and three

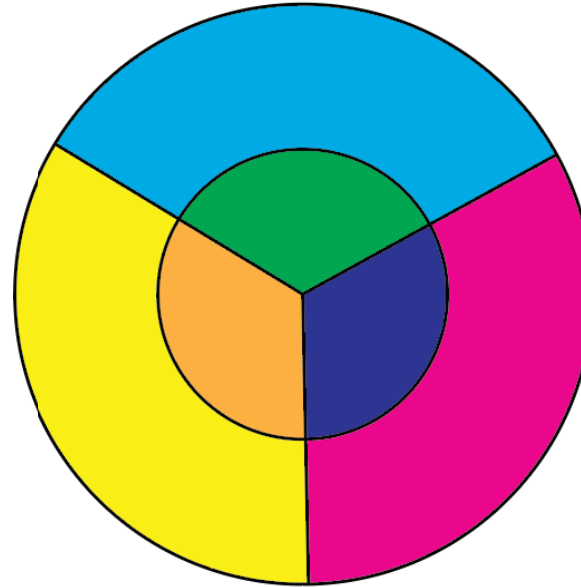
Answer Key

1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.

$2 \times 3 = 6$



$3 \times 2 = 6$



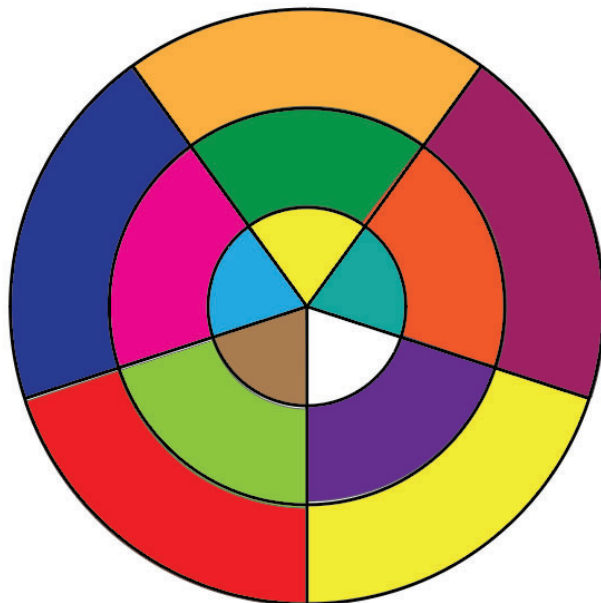
Student writing will vary.

Concentric Circles Multiplication  
Factors: Three and Five

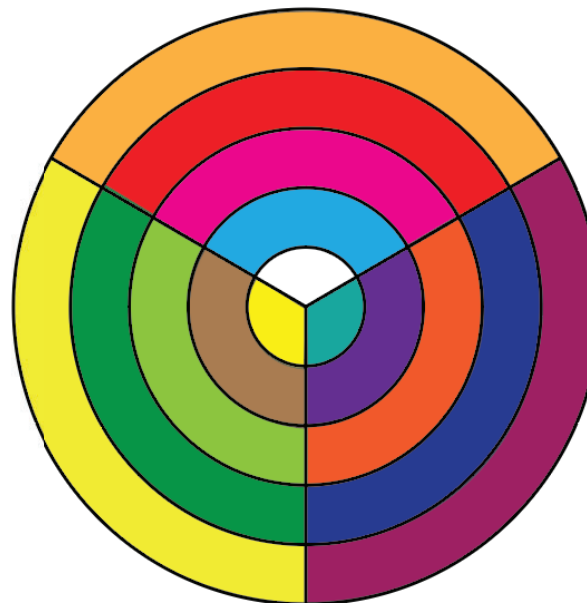
Answer Key

1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.

$$5 \times 3 = 15$$



$$3 \times 5 = 15$$



Student writing will vary.

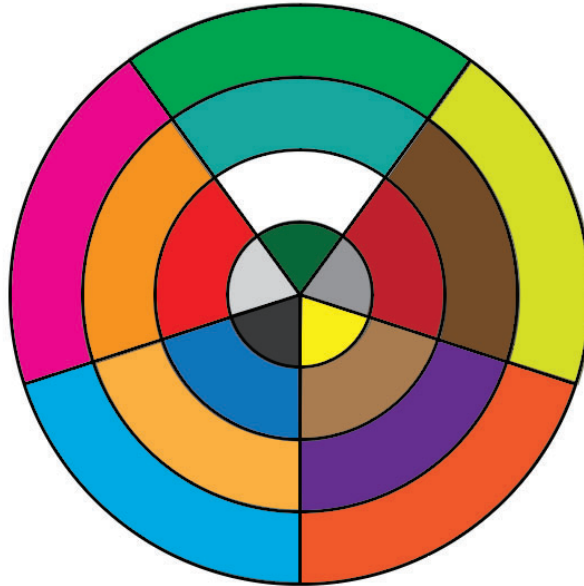
First, I colored in every arc and little slice of both circles. I used the same colors on both circles. I only used each color once (well, twice but on different circles). I used fifteen colors. I also counted 15 pieces in both circles. This didn't surprise me because three multiplied by five is fifteen. I learned that it doesn't matter if the five comes first or if the three comes first, as long as the factors are 3 and 5 the answer will always be 15!

Concentric Circles Multiplication  
Factors: Four and Five

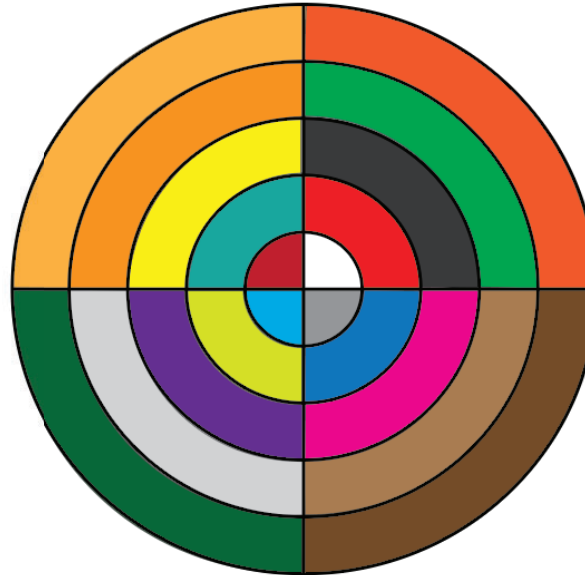
Answer Key

1. Color each piece of the circles.
2. Write a number sentence to go with each circle.
3. Review your work.
4. Write about what you did and learned.

$5 \times 4 = 20$



$4 \times 5 = 20$



Student writing will vary.



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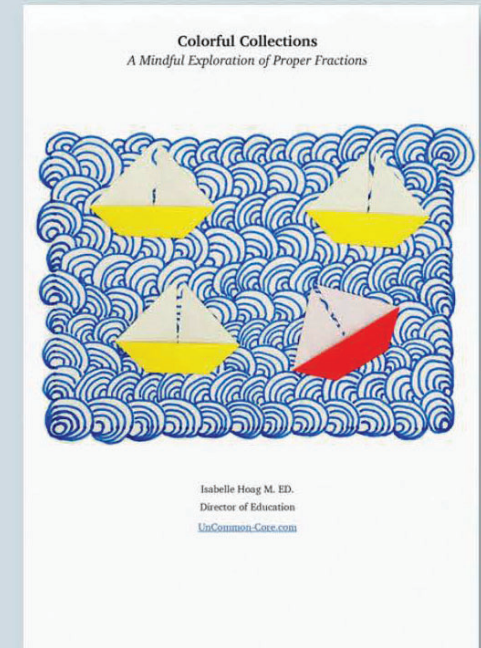
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