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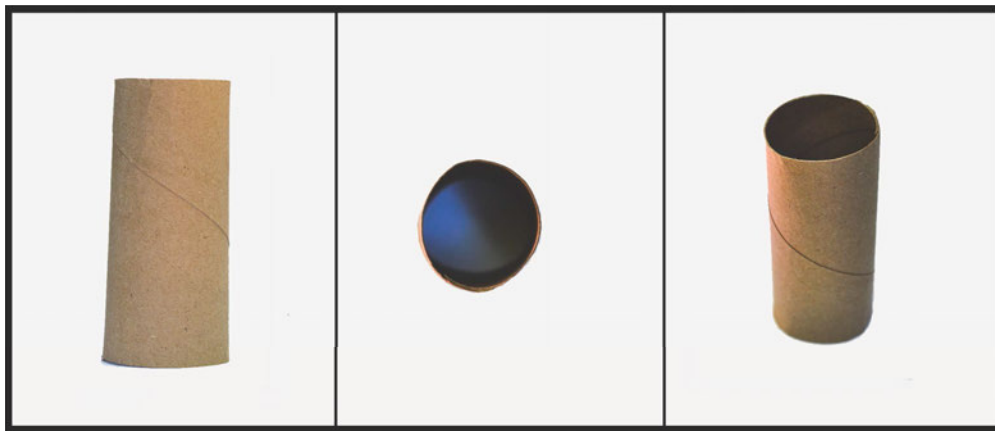
Unit 3, Lesson 3: Exploring Circumference

Let's explore the circumference of circles.

3.1: Which Is Greater?

Clare wonders if the height of the toilet paper tube or the distance around the tube is greater. What information would she need in order to solve the problem? How could she find this out?

NAME   DATE   PERIOD

3.2: Measuring Circumference and Diameter
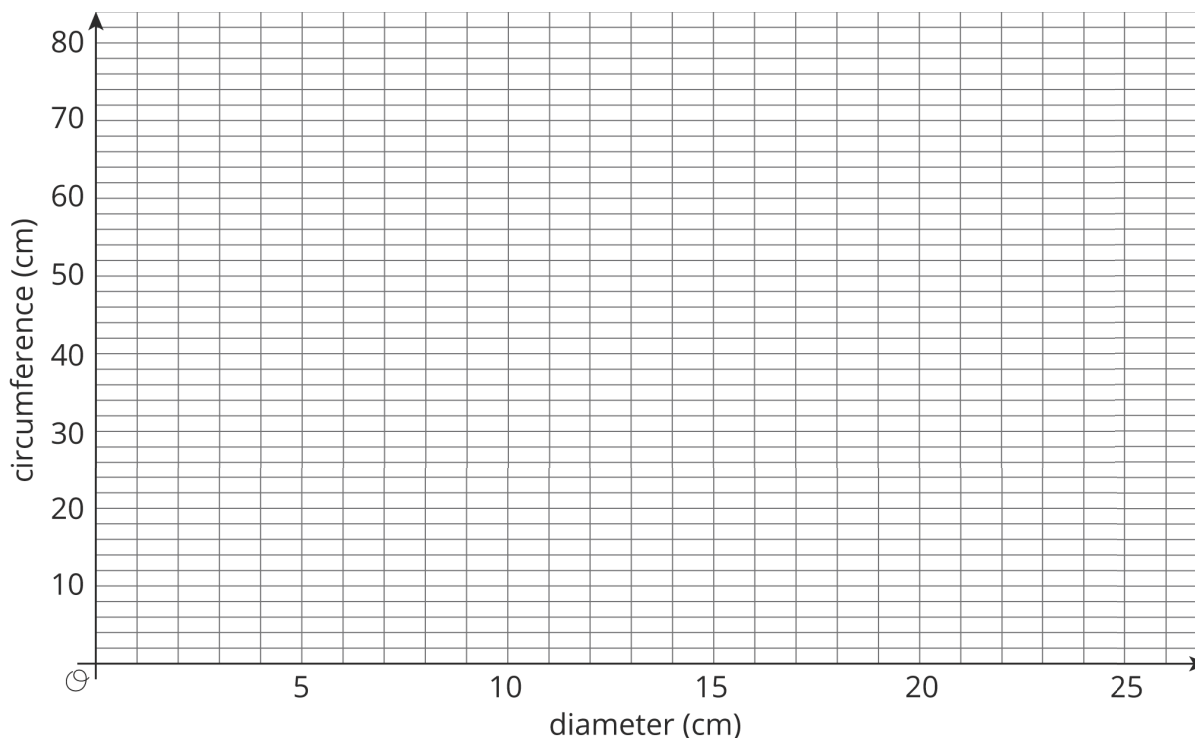
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Your teacher will give you several circular objects.

1. Measure the diameter and the circumference of the circle in each object to the nearest tenth of a centimeter. Record your measurements in the table.

object	diameter (cm)	circumference (cm)

2. Plot the diameter and circumference values from the table on the coordinate plane. What do you notice?

3. Plot the points from two other groups on the same coordinate plane. Do you see the same pattern that you noticed earlier?
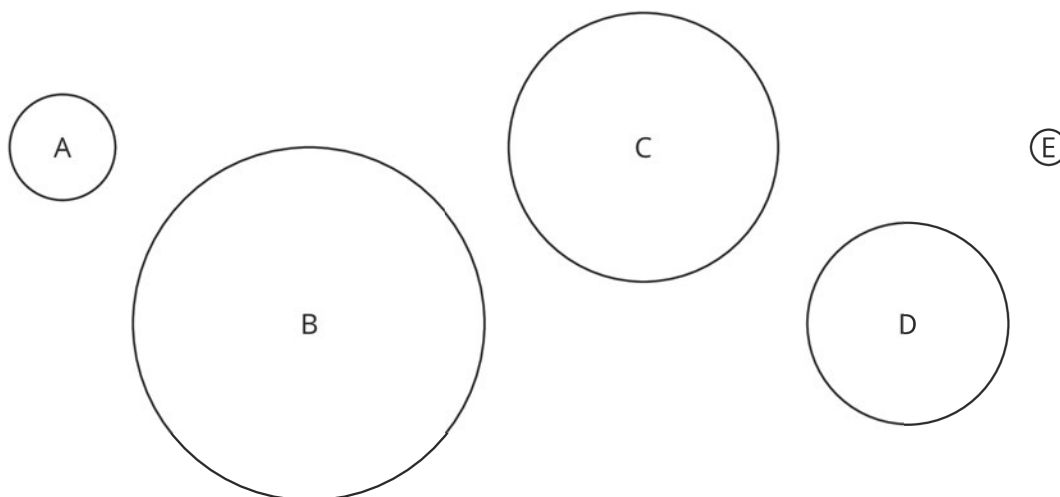
Are you ready for more?

Suppose you had another circular object with a diameter that is half as long as the diameter of your largest circle. What would its circumference be?

3.3: Calculating Circumference and Diameter

Here are five circles. One measurement for each circle is given in the table.

Use the constant of proportionality estimated in the previous activity to complete the table.

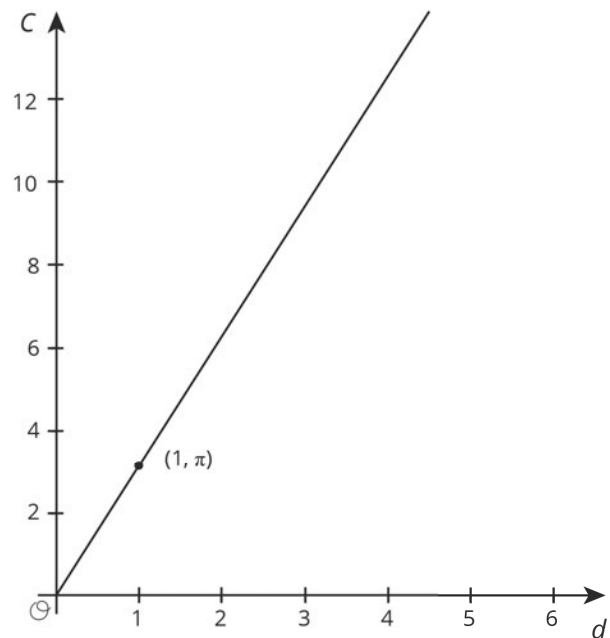|	diameter (cm)	circumference (cm)
circle A	3	
circle B	10	
circle C		24
circle D		18
circle E	1	

Are you ready for more?

The circumference of the Earth is approximately 40,000 km. If you made a circle of wire around the globe, that is only 10 meters (0.01 km) longer than the circumference of the globe, could a flea, a mouse, or even a person creep under it?

Lesson 3 Summary

There is a proportional relationship between the diameter and circumference of any circle. That means that if we write C for circumference and d for diameter, we know that $C = kd$, where k is the constant of proportionality.

The exact value for the constant of proportionality is called π. Some frequently used approximations for π are $\frac{22}{7}$, 3.14, and 3.14159, but none of these is exactly π.

We can use this to estimate the circumference if we know the diameter, and vice versa. For example, using 3.1 as an approximation for π, if a circle has a diameter of 4 cm, then the circumference is about $(3.1) \cdot 4 = 12.4$ or 12.4 cm.

The relationship between the circumference and the diameter can be written as

$$C = \pi d$$

Lesson 3 Glossary Terms

- pi (π)

Unit 3, Lesson 3: Exploring Circumference

1. Diego measured the diameter and circumference of several circular objects and recorded his measurements in the table.

object	diameter (cm)	circumference (cm)
half dollar coin	3	10
flying disc	23	28
jar lid	8	25
flower pot	15	48

One of his measurements is inaccurate. Which measurement is it? Explain how you know.

2. Complete the table. Use one of the approximate values for π discussed in class (for example 3.14, $\frac{22}{7}$, 3.1416). Explain or show your reasoning.
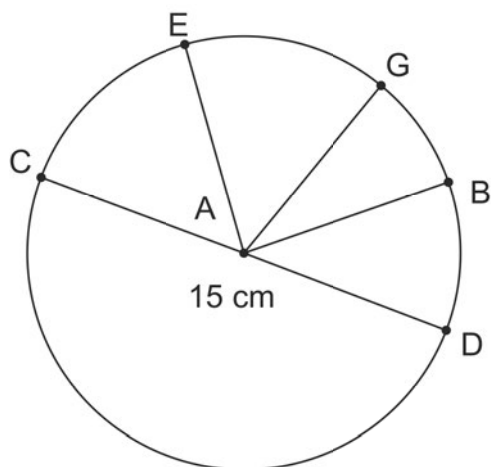
object	diameter	circumference
hula hoop	35 in	
circular pond		556 ft
magnifying glass	5.2 cm	
car tire		71.6 in

3.   a. Name a segment that is a radius. How long is it?

    b. Name a segment that is a diameter. How long is it?
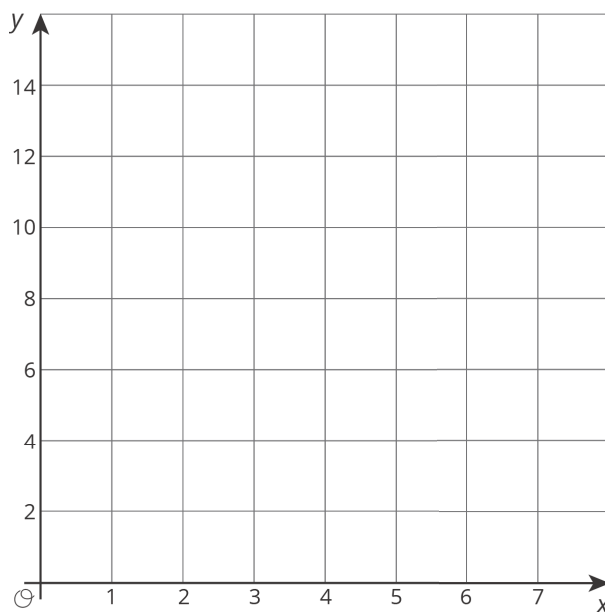
(from Unit 3, Lesson 2)

4. a. Consider the equation $y = 1.5x + 2$. Find four pairs of x and y values that make the equation true. Plot the points (x, y) on the coordinate plane.

    b. Based on the graph, can this be a proportional relationship? Why or why not?

(from Unit 2, Lesson 10)