

Geometry – Unit 10 Activity  
Deriving the Circumference Formula

G.GMD.A.1

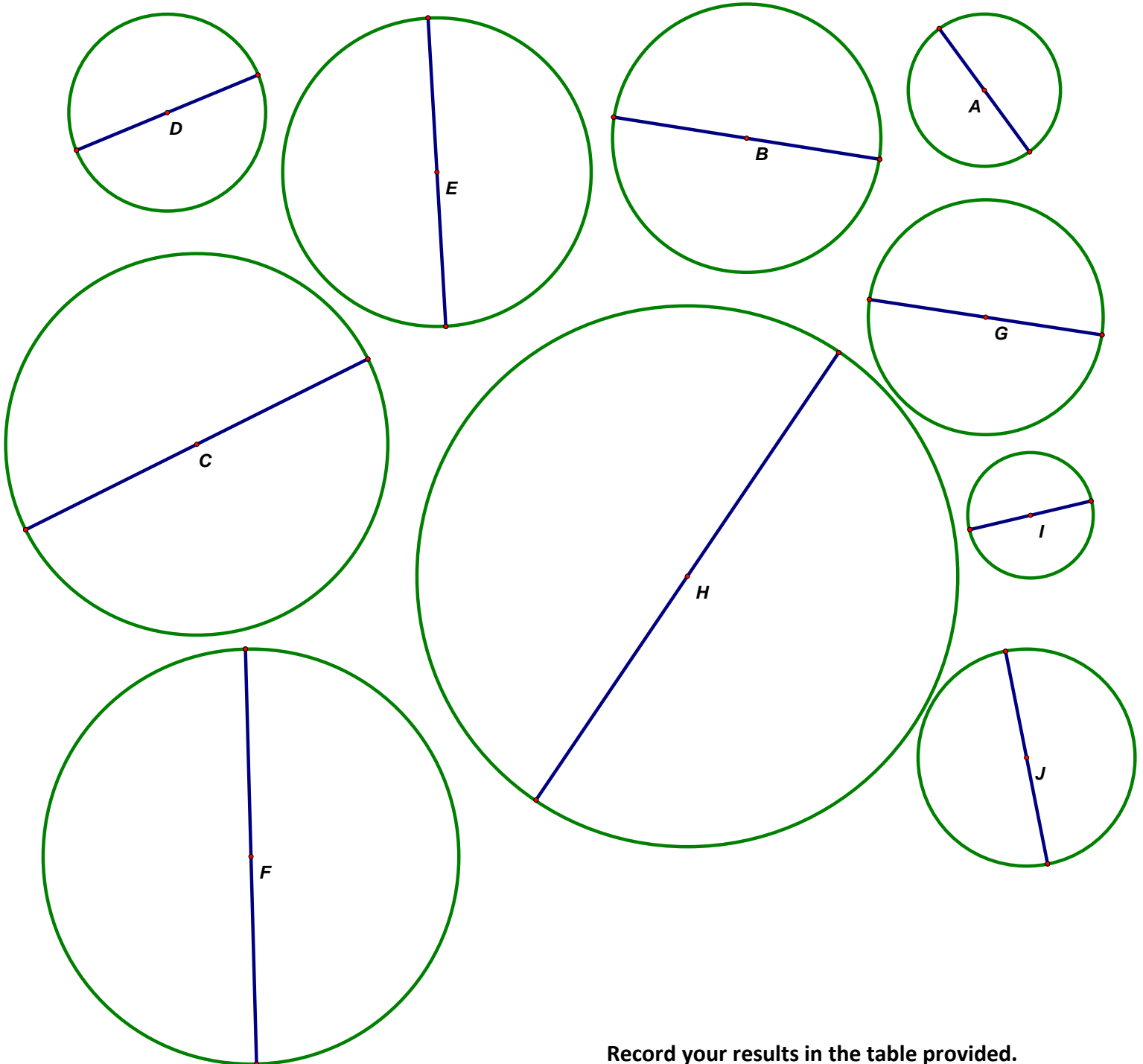
Name: \_\_\_\_\_!

Date: \_\_\_\_\_ Pd: \_\_\_\_\_

**BRAINSTORM:** How can we measure the circumference of a given circle?

- Since the curved “perimeter” of a circle does not allow us to use a ruler (in the traditional way), how can we compensate?
- What nontraditional materials could we use to help us?
- Would cutting the circle out help?

1) Chose 5 of the circles below, measure their diameters and circumferences to the nearest millimeter.



Record your results in the table provided.





CIRCLE name	diameter (mm)	Circumference (mm)	$\frac{\text{Circumference}}{\text{diameter}} = ?$ (Round answer to 2 decimal places)
			$\frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} = \boxed{\phantom{000}}$
			$\frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} = \boxed{\phantom{000}}$
			$\frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} = \boxed{\phantom{000}}$
			$\frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} = \boxed{\phantom{000}}$
			$\frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} = \boxed{\phantom{000}}$

2) Calculate the average of your results:

$$\frac{\boxed{\phantom{000}} + \boxed{\phantom{000}} + \boxed{\phantom{000}} + \boxed{\phantom{000}} + \boxed{\phantom{000}}}{5} = \boxed{\phantom{000}}$$

Round to two places.

3) Find 4 other students to compare averages. Is yours higher, lower, or in the middle?

4) Average your results with theirs:

$$\frac{\boxed{\phantom{000}} + \boxed{\phantom{000}} + \boxed{\phantom{000}} + \boxed{\phantom{000}} + \boxed{\phantom{000}}}{5} = \boxed{\phantom{000}}$$

Round to two places.

5) What famous number do you recognize? \_\_\_\_\_

6) What was your margin of error? \_\_\_\_\_



**Practice – Unit 10 (cont.)**

Notice that the definition of pi ( $\pi$ ) is the circumference  $C$  of any circle divided by its diameter  $d$ .

Pi is defined as  $\pi = \frac{C}{d}$  for any circle.

- 7) Solve for  $C$  to find the formula for *Circumference of a Circle*.
- 8) Since the diameter of a circle is twice its radius, substitute  $2r$  for  $d$ .  
What is the resulting formula?
- 9) Choose any of the circles given in question #1.  
Determine how many radii are needed to trace the circumference of the circle.
- 10) Compare your answer with 2 other students. Were your results similar to theirs?
- 11) Why? Or why not?

