

# How important is a decimal place?

Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

## Introduction

- Place the pin with the attached string into the center of the corkboard.
- Extend the string and place pins into the corkboard at the end of the string. Rotate the string and continue placing pins until you have a circle of pins.
- Use your measuring tape to find the circumference (perimeter) of your circle. This measurement may be a slight overestimation. Record your method of measurement and circumference with units.
- Find a second way to measure the circumference of your circle. This measurement may be a slight underestimation. Record your method of measurement and circumference with units.

	Circumference	Method of Measuring Circumference
Measured Circumference 1 Overestimation		
Measured Circumference 2 Underestimation		

- The distance from the center of the circle to the edge is called the radius ( $r$ ). In this case, the radius is equal to the length of the string. The diameter ( $d$ ) is the distance across a circle and is equal to  $2r$ .
- Measure the radius. Be as exact as you can and record this measurement in the chart below.
- Calculate the circumference using the formula:  $Circumference = 2 \pi r$
- Record your answer below. Include 4 decimal places and include units.

	Radius	Circumference
Calculated Circumference		

## Please answer the following questions in complete sentences.

1. Compare your two measured values. Are they the same? Explain why or why not.

\_\_\_\_\_

\_\_\_\_\_

2. How close are your measured and calculated values?

\_\_\_\_\_

\_\_\_\_\_

3. Which do you think is more exact? Why?

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4. Is the calculated circumference exact or has the calculator rounded this number?

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5. Where do you think it is reasonable to round the calculated circumference? Why?

## Background:

Pi ( $\pi$ ) is a never ending or repeating number [Pi ( $\pi$ ) = 3.141592654.....continuing]. Pi is very important when calculating the area, perimeter, and volume of a circle. Here are some of the formulas that are commonly used:

$$\text{Area} = \pi r^2$$

$$\text{Volume} = \frac{4}{3} \pi r^3$$

$$\text{Circumference} = 2 \pi r \text{ or } \pi d$$

## Assignment:

You are going to design an experiment to show what would happen if Pi were rounded or approximated to 3.0, 3.1, or 3.2. Your control is the real pi.

- Begin by creating a specific question you are going to test involving the rounding of pi and one of the above formulas.
- Complete the Experimental Design Graphic Organizer and all steps on the checklist.
- Remember, you should run multiple trials to prove your answer.
- Complete the Explain assignment.
- Complete the Elaboration assignment.