

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?

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

Background:

Pi (π) is a never ending or repeating number [Pi (π) = 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.