

LESSON 2

6th and 7th grade lesson

FINDING PI

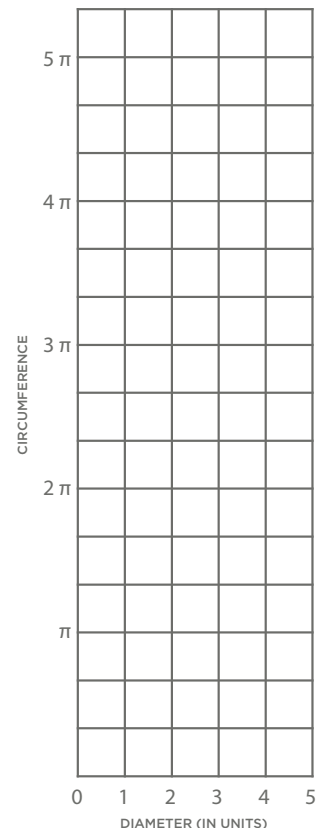
Directions for creating the graph for this activity are provided in questions 1 – 9.

1. Using two copies of centimeter ruler pages, create two tape measures. Cut each page along the dotted lines and tape the strips together so that the 20 cm mark of the first strip lies exactly under the 20 cm mark of the second strip. Repeat the process of lining up the repeated units until a tape measure 100 cm long is created. The two strips will be used as the vertical and horizontal scales on your butcher paper graph.
2. On the butcher paper construct an x-axis and y-axis. Draw a vertical line for the y-axis 10 centimeters from the left side of the paper and a horizontal line for the x-axis 10 centimeters above the bottom of the paper. Line up one vertical tape just to the left of the vertical axis making sure that 0 on the tape is level with the bottom of the y-axis and then tape it in place. Put the second tape just below the horizontal axis. Line its zero up with the beginning of the x-axis and tape it in place. Ask your teacher to check your graph.
3. Compare the diameter of your circular objects by holding them against one another. Place your circular objects in order from the smallest diameter to the largest diameter. List the names of the objects in this order in the table above question 11.
4. Measure the diameter of the circular objects to the nearest millimeter and record the length of the diameter of each object in the table.
5. Wrap the ribbon around one of the circular objects and then cut the ribbon to the length of the circumference (the distance around the object).
6. Measure the length of the ribbon to the nearest millimeter. Now record this value in the circumference column of the table. Be sure to record it next to the diameter for the same object.
7. For the first object in the chart, locate the x-value on the graph that corresponds to its diameter. Glue the ribbon strip that you used to measure the circumference of that object vertically above the x-value of the diameter. Be sure that it is perpendicular to the x-axis and parallel to the y-axis.
8. Using the scale glued to the graph for the y-axis, check the length of each ribbon to see if it is close to the measurement recorded in the table for the circumference.
9. Repeat the process in steps 7 and 8 with the next object until you have graphed the diameter and circumference of all 4 of your circular objects.
10. Choose a point on the graph. Explain what this specific point means in terms of the circular object it represents. Write this answer on your poster.

OBJECT NAME	CIRCUMFERENCE	DIAMETER	CIRCUMFERENCE ÷ DIAMETER

- Complete the table by calculating the ratio of the circumference to the diameter, $C \div d$, of all four of your objects. Round your answers to the nearest hundredth. Average the four values in the $C \div d$ column and record this average in the space below.
- What is the name for the measure of central tendency that you just calculated in question 11?
- The value of π is a constant because its value is always the same. Locate the π button on your calculator and press enter. Record all the numbers that are displayed on your calculator.
- What is the number, rounded to two decimal places, that is often used as the value of π ?
- Is there a difference in the value you determined in question 11 and the rounded value we often use for π ? If there is, why do you think this difference exists?
- Write an equation that can be used to determine the value of the constant, π , if you know the circumference and the diameter of a circular object.
- Write an equation that can be used to determine the circumference of a circle if you know the value of the constant, π , and the diameter of a circular object.
- Solve the equation in question 17 for d . In other words, write an equation that can be used to determine the diameter of a circular object if you know the circumference of the object and the value of π .
- Complete the chart with exact answers (answers in terms of π) for the circumference. Plot the coordinates of your five points. Make sure that the diameter is the first coordinate (x -axis) and the circumference is the second coordinate (y -axis). The coordinates of each point will be (diameter, circumference).

DIAMETER	CIRCUMFERENCE
1	
2	
3	
4	
5	



- Connect the points on the graph. Do your points connect in a straight line? If you were to extend your line, would the line pass through the origin (0,0) on your graph? What would the values at the origin represent?
- For each increase of one unit in your diameter, what happens to the value of the circumference?
- Write a paragraph describing the activity and your conclusions.