

Pi to Go Around

Purpose

Students will relate pi as a ratio between the circumference and diameter of a circle, find estimates for the value of pi, compare these values, and realize the estimates are all close to three.

Materials

For the teacher: string that does not stretch, five to seven large round objects (trash can, bucket, coffee can, 2-liter plastic bottle, bowl, serving platter, etc.), large paper or cardboard circle, Black Line Master (BLM) *Finding Circumference*

For each group of 2-3 students: copy of BLM *Finding Circumference*, long piece of cord, meter measure, yard measure

Activity

A. Introduction

1. Demonstrate with the large paper circle that the diameter of the circle passes through the center of the circle and is the longest distance across the circle.
2. Demonstrate that the circumference of the circle is the distance all the way around the edge of the paper circle.

B. Activity

1. Pass out one round object to each group. Explain that groups will take turns measuring each object.
2. Demonstrate wrapping the cord around one of the objects. Tell students that it is very difficult to get accurate measurements. Instruct students to take three separate measurements for each circumference and record the mean, or average, on the BLM.
3. Demonstrate measuring the diameter. Instruct students to take three separate measurements for each diameter and record the mean, or average, on the BLM.
4. Instruct the groups to complete the ratios as indicated on the BLM, then pass the object to the next group.
5. Ask students to continue with measuring, recording, and computing ratios until they have an entry for each object.

(continued)



INCORPORATING TECHNOLOGY

Give the students time to go online and find other information about the history of pi. A good starting place is www.cecm.sfu.ca/pi/pi.html.



EXTENDING THE ACTIVITY

Ask students to draw a plan to scale of a round building with a radius of 30 feet, add a three-foot walk around it, and figure an approximate circumference of the inside of the walk and the outside of the walk.

Standards Links
6.1.4, 6.5.1

Activity (continued)

C. Class Discussion

1. After students have completed the BLM, discuss their results with the class (students should discover that the ratio of the diameter to the circumference is about 3:1).
2. Stress that student data might not be accurate due to measurement discrepancies.
3. Explain that the ratio of the diameter to the circumference has its own name: *pi*. Tell students that the symbol for pi is π and the value of pi is about 3.
4. Ask students to use this discovery to estimate the following:
 - Circumference of a circle with a diameter of 6 cm [18 cm]
 - Diameter and radius of a circle whose circumference is 99 cm [diameter: 33 cm, radius: 16.5 cm]

Classroom Assessment

Basic Concepts and Processes

As students are completing the activity, ask the following questions:



What is the circumference of a circle whose diameter is 4 cm?



What is the measure of the diameter of a circle whose circumference is 24 in?



How would you go about finding the circumference of a circle if you are given the radius of that circle?

Names: _____

FINDING CIRCUMFERENCE

Fill in the chart by measuring your collection of objects.
Use the string to measure the circumference and length
around the circle.

Write each measurement in both inches and centimeters.
Round measures to the nearest inch or centimeter.

Name the object	Diameter	Circumference	Ratio: $\frac{\text{circumference}}{\text{diameter}}$

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The ratio is close to what number? _____

FINDING CIRCUMFERENCE

Teacher Directions

Distribute one copy of the BLM *Finding Circumference* to each group of students.
Remind students to measure in both inches and centimeters.

Answer Key

Answers will vary according to objects chosen, but students should find that the ratio between the circumference and the diameter is about 3 to 1.