

Discovering Pi

(To be done in conjunction with Investigation of Pot Sherds)

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Lesson Overview: Students will experiment with the concept of pi. They will discover the relationship between the circumference and diameter of circles.

Objectives: Students will

- Measure the circumference of a variety of round objects
- Measure the diameter of the objects
- Discover the relationship of the circumference and diameter

TEKS [mathematics] 4.8; 4.12; 4.14; [social studies] 4.7; 4.8; 4.9.

Materials: Paper, pencils, a collection of flat round objects that are numbered (plate, Frisbee, lids from jars, etc), string, and a ruler.

Activity: Ask the students to measure several round objects, recording the diameter and circumference.

Step1: Divide class into groups of two.

Step 2: Give materials to student teams.

Step 3: Have student teams make a table or chart that shows name or number of object, circumference, diameter, and a "?" Note: You may want to record a definition of circumference and diameter.

Step 4: To measure the circumference of the circle, you can begin by tracing the string around the edge of the circle. The student must start tracing with an end of the string. When the string starts to overlap itself, the student should mark it. Each student should then straighten the string and measure from the end to the mark.

Step 5: To measure the diameter, the student should measure across the circle (making sure that they go through the center).

Step 6: Have students measure and record each object's circumference and diameter, then divide the circumference by the diameter and record result in the "?" column.

Step 7: Have students find the average for the "?" column and compare to other groups in the class to determine a pattern. Help them see that the number is always about 3. They can continue this observation for the entire class.

Step 8: Explain to the students that they have just discovered pi, which is very important in finding the circumference of an object. (You may wish to give some historical information about pi at this time or have students research the information.)

Step 9: Have students come up with a formula to find the circumference of an object knowing only the diameter of that object, and the number that represents pi. Students should prove their formula works by demonstration and measuring to check their results.

Closure: Discuss with the students the value of knowing pi. Brainstorm a list of ways you could use this information. Have students write their conclusions for the activities they have just done. Give students three problems listing only the diameter of each object and have them find the circumference. Encourage students to share learned knowledge with parents.

Extension: As a lead for the next activity, Investigation of Pot Sherds, discuss with students the reasons why archeologist might want to know more about pottery used by ancient peoples.

Student may also be interested in a further investigation of pi. The following web sites may be useful:

<http://www.unf.edu/~tbratina/brandi.htm>

http://www.highland.madison.k12.il.us/jbasden/lessons/3_14159265358.html