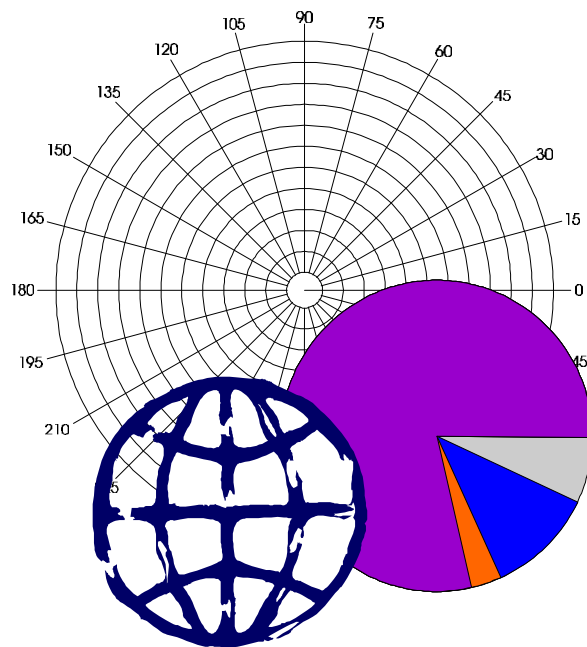


THE WORLD OF CIRCLES



CFE 3326V

OPEN CAPTIONED
ALLIED VIDEO CORPORATION
1992
Grade Levels: 5-9
22 minutes

DESCRIPTION

What are circles? What is a radius? What does diameter mean? How can it be measured? What do circumference and pi mean? How can one find the area of a circle? Uses animated graphics to clearly define and illustrate a circle and its parts. Sample problems reinforce concepts. Shows how to use a compass.

INSTRUCTIONAL GOALS

- To define *circle*, *radius*, *diameter*, and *chord*.
- To demonstrate how to draw a circle with a compass and a ruler.
- To introduce the concept of *pi*.
- To show how to calculate the circumference of a circle using the formula $C = \pi D$.
- To show how to find the area of a circle using the formula $A = \pi r^2$.

BEFORE SHOWING

1. Preview the video to determine unfamiliar vocabulary and language concepts.
2. List common circular objects found in the classroom, gymnasium, kitchen, and bedroom.
3. Discuss ways to draw perfect circles.
 - a. What tools are needed?
 - b. How can one draw unusually large circles?

DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. Pause at the scene showing $D = 2r$. Give some values for r and determine the answer for D .
3. Pause at the scene introducing the concept of *circumference*.
 - a. Explain that *circumference* and *perimeter* are the same idea.

- b. Discuss ways in which one could manually measure the circumference of a circle.
- 4. Pause at the scene showing the three diameter lengths on the edge of the circle. Estimate the fraction of the remaining part.
- 5. Pause at the scene showing the answer of 28.26 square inches. Discuss why the answer to area problems is written in square units.

AFTER SHOWING

1. Obtain several circular objects and use a ruler to measure their radii and diameters.
2. Design a worksheet displaying circles of various sizes. Use a ruler to measure their radii, then calculate the circumference and area of each.
3. Obtain several circular shapes.
 - a. Cut pieces of string the same length as the diameter.
 - b. Place the pieces of string on the edge of the circle.
 - c. Determine how many diameters fit on the circumference.
4. Calculate pi to the tenth decimal place. Print the value on a banner and display it in the classroom.
5. Obtain several kinds of calculators: regular calculator, scientific calculator, and graphic calculator.
 - a. Determine which calculators have a key for pi.
 - b. Determine to which decimal place the value of pi is rounded off on the calculators.
6. Complete a worksheet on the value of pi.
 - a. Find five circular objects of various sizes, such as a bicycle wheel, a Frisbee, or a coffee can.
 - b. Use a string and a ruler to measure the diameter and circumference of each. Record in a table.
 - c. Use a calculator to determine the value of pi, which is $\frac{c}{d}$.

- d. Answer the following questions about the activity:
- (1) Pi has an approximate value of $3\frac{1}{7}$, or what decimal?
 - (2) What is the largest calculated value for pi?
 - (3) What is the smallest calculated value for pi?
 - (4) What are some possible reasons the calculated values for pi may not be accurate?
7. Complete a worksheet on calculating circumferences and areas of circles.
8. Make a collage of pictures of circular objects from magazines.
9. Make a list of words that also describe circular shapes: *oval, ellipse, loop, ring-shaped*.

WEBSITES

Explore the Internet to discover sites related to this topic. Check the CFV website for related information (<http://www.cfv.org>).

SUMMARY

A *circle* is a line that is curved so that it is the same distance from a center point. A straight line from the center of a circle to the edge is called the *radius*. The radius is the same length at any position between the center of the circle and the edge. If one knows the length of the radius, one can draw a circle using a compass and a ruler.

The *diameter* is a straight line that passes from one edge of a circle through the center to the other edge. A *chord* is a line that connects two places on the edge of a circle without passing through the center. The length of the diameter is equal to twice the length of the radius. Also, the radius equals the diameter divided by two.

The distance around the circle is called the *circumference*. In all circles, the circumference is

always equal to three diameters plus one-seventh of the length of the diameter. The ancient Greeks called this $3\frac{1}{7}$ diameters pi. Pi is also equal to 3.14. The length of the circumference divided by the length of the diameter is always equal to pi. The formula for finding the circumference is $C = \pi D$.

If the diameter is 4 inches, multiply 3.14 by 4; the circumference is 21.98 inches.

To find the area of a circle, pi is multiplied by the radius squared. *Squared* means the radius is multiplied by the radius. The formula for the area of a circle is $A = \pi r^2$. If the radius is 3", multiply 3" x 3" and the result is 9 square inches. Then multiply 3.14 times 9 square inches; the area of the circle is 28.26 square inches.