

CIRCLES

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

4

Overview

This lesson plan covers teaching content for;

1. Identifying the components of a circle
2. Differentiating between radius and diameter
3. Measuring a circle to find the circumference, diameter and radius
4. Calculating the circumference, radius and diameter of a circle
5. Solving quantitative problems on circles

Objectives

Students should be able to;

1. Identify the components of a circle – radius, diameter, and circumference of a circle
2. Differentiate between radius and diameter
3. measure a circle to find the circumference, diameter, and radius.
4. Solve quantitative problems on circles

Activity Starter/Instruction

1. The teacher will tell the students that today they are going to be learning about circles.
2. The teacher will begin by asking the students what they know about circles.
3. The students will discuss if a circle is a polygon or not.
4. They will also discuss the total number of degrees in a circle.
5. This questioning will service as a formative assessment and guide the teacher to adapt and adjust instruction as necessary.
6. The teacher will tell the students that today they are going to be identifying and naming parts of a circle.
7. They will also be learning about the relationship between the diameter and radius of a circle.
8. The teacher will explain that during class today the students will be creating and labeling a plethora of circles.

Teacher Guide

Day 1/ Lesson 1: 30 Mins

1. When the students enter the classroom the desks will be arranged into a circle.
2. This gets the students interested into the topic of instruction- circles.
3. The students will also be given the chance to participate in a bodily/kinesthetic and visual/spatial activity by creating a life-size circle in the classroom.
4. All of the students will be asked to stand up and form a circle.
5. One student will be selected to serve as the center point of the circle The teacher will explain to the students that together they form the circumference of the circle.
6. Yarn will then be extended across the circle to create the other various parts.
7. Each part (radius, diameter, chord, central angle, arc, and circumference) will be created with the yarn and discussed in detail.

Materials Required

- Whiteboard
- Pencil
- Ruler
- Compass
- Circular objects
- yarn

Additional Resources

- <http://www.pdesas.org/module/content/resources/4>
- <https://www.turtlediary.com/lesson/parts-of-circle.html>
- <https://www.homeschoolmath.net/teaching/g/circles>
- <http://operationmaths.ie/digging-deeper-circle-5th-6th>
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. The students will use a circular object (e.g. bottle cap) to make a circle model.
2. The teacher will guide the students through the drawing and labeling of each part of the circle on the paper plate.
3. The teacher will have the students reflect on the parts of a circle.
4. In a circle, every point on the circle is at the same distance from the center point.
5. The center point helps in recognizing the circle.
6. As you can probably guess from the name, a circle with center O.

Guided Practice

Day 3/ Lesson 3: 20 Mins

1. Radius: The radius of a circle is a line segment that goes from the center point to a point on the circle. It is generally represented as 'r'.
2. A circle has many radii (that's the plural of radius) as you can draw many different lines from the center point to a point on the circle. Each radius is of same length.
3. Diameter: The diameter of circle is a line segment that goes all the way across a circle through the center point. It is the longest distance across the circle as it passes through the centre. It is represented as 'd'.
4. A circle actually has many diameters since you can draw many different lines through the center of the circle. Each diameter, however, has the same length.
5. $\text{diameter} = 2 \times \text{radius} = 2 \times r$
6. Circumference: The circumference of a circle is the distance around the outer edge of the circle. It is really a fancy name for the perimeter of the circle.
7. $\text{Circumference} = 2 \times \text{Pi} \times r$ where $\text{Pi} = 3.14$
8. Through comparing the measurement of the circumference and diameter of various circles, it is hoped that the children realize that the circumference of a circle is always just over three times the measure of the diameter (This is where pi is derived).
9. If you were to run around a circular track, the distance you ran would be the circumference of the circular track.

Guided Practice

Day 4/ Lesson 4: 25 Mins

1. The difference between other round figures and circles is this:
2. In a circle, the distance from the center point to the actual circle line, or circumference of the circle, remains the same. This distance is called the radius of the circle.
3. In other words, all the points on the circumference are AT THE SAME DISTANCE from the center point. This is not the case in other round objects (like ovals)
4. The children should be provided with ample opportunities to measure the radius and diameter of circles of various sizes and, in doing so, be guided to discover for themselves that the measure of the diameter is twice the radius.
5. Ensure that all pupils can measure correctly using a ruler and protractor and that they are comfortable using a compass.
6. Demonstrate how to draw a circle using a compass when given a certain radius or diameter
7. Remind the students that
Diameter, $d = 2 \times \text{radius} = 2 \times r = 2r$.
Circumference, $C = \text{pi} \times d = \text{pi} \times (2 \times r) = 2(\text{pi})r$
Area, $A = \text{pi} \times r \times r = (\text{pi})r^2$

Assessment

Assessment Activity

1. Draw many circles with the compass.
2. Now, set the radius on the compass to be 3 cm, and draw a circle.
3. You can do that by placing the compass next to a ruler, and adjusting
4. The radius of the compass until it is 3 cm as measured by the ruler.
5. Some compasses show the radius for you, so you won't need a ruler.
6. Draw a circle with a radius of 5 cm.
7. Draw a circle with a radius of $1\frac{1}{2}$ in.

Summary

Review and Closing

Review the facts that

1. A circle is a set of points all the same distance from a fixed point
2. a) The radius is the distance from the centre of the circle to any point on the circle
b) The diameter is a line that joins 2 points on a circle that passes through the centre of the circle
c) The circumference the distance around the circle

Assessment Activity

1. Draw a square of sides 5cm each.
2. Draw two diagonals into this square.
3. Draw a point where they cross (the center point of the square).
4. Now, erase the lines you drew, leaving the point.
5. Draw a circle around the square so that it touches the vertices of the square. Use the point you drew above as the center point.
6. Fill in: The _____ of the circle has the same length as the diagonal of the square.

Review and Closing

1. Pupils should be able to calculate the circumference of circles using a formula.
Give extra practice if needed
2. Ask pupils to find some everyday object with a circular shape and to measure the diameter and find the circumferences using the formula (This could be done when they get home).