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| **THEME:** | PLANE FIGURES |
| **DATE**: | 09– 10 – 2024 |
| **CLASS**: | Js 3 |
| **TIME**: | 8:40-09:20am |
| **DURATION** | 40 MINUTES |
| **SUBJECT**: | Mathematics |
| **UNIT TOPIC:** | AREA OF PLANE FIGURES |
| **LESSON TOPIC:** | CIRCLE |

**SPECIFIC OBJECTIVE**: By the end of the lesson, students should be able to calculate the area of a circle

1. Using the radius
2. Using the diameter
3. Using the circumference

**INSTRUCTIONAL RESOURCES:** Chart showing a circle and its parts

**LESSON PRESENTATION**

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| **STEP 1** | **PREVIOUS KNOWLEDGE:** students were taught how to solve the areas of a triangle, parallelogram and trapezium. | | Students recall. |
| **STEP 2** | **EXPLORATION:**  The teacher introduces the topic with the following questions: **What is the area of a circle using the radius?****What is the area of a circle using the diameter?**  1. Calculate the area of a circle whose diameter is 24cm. | | Students make attempt to answer the questions. |
| **STEP 3**  **Obj 1;**  **Obj 2**  **Obj 3** | **DISCUSSION:**  ***Teacher starts the discussion:*** **circumference** diameter **Area of a circle using the radius** **Area of a circle = π × radius × radius**  **π** = 3.14159265358979323846… **Example 1 — Find the area of a circle using the radius of 5 cm.**  Area = π × radius × radius  We know the radius, so put it into the formula above:  Area = π × radius × radius  Area = π × 5 × 5  Area = 78.5 cm2 .  **Area of a circle using the diameter**  In maths, you will not always be given the radius of a circle. However, it is still possible to find the area. Here are the steps you must take to find the **area of a circle using the diameter**:  Step 1: Find the radius  The radius is equal to half of the diameter. So, in order to find the radius, we must divide the diameter by 2:  radius = diameter ÷ 2  Step 2: Use formula using the radius  Now, that we know the radius, we can use the same formula for the area as before.  Area = π × radius × radius  We are multiplying r by itself in this equation, which means that we are squaring it. So, the formula can be simplified to this:  A= π ×r2  Finally, because this is an algebraic formula, we can remove the × sign:  A**= π**r**2**  Let’s put this into practice with an example.  **Example 1 — Find the area of a circle using the diameter of 14 m.**  Radius = diameter ÷ 2  Radius = 14 ÷ 2  Radius = 7 m  Area = π × radius × radius  Area = π × 7 × 7  Area = 153.9 m2  **Example 2 — Find the area of a circle using the diameter of 32 m.**  Radius = diameter ÷ 2  Radius = 32 ÷ 2  Radius = 16 m  Now, we can find the area using the original formula:  Area = π × radius × radius  Area = π × 16 × 16  Area = 804.2 m2 ****Area of a circle, using the circumference**** In some cases, you will find that the radius and the diameter of a circle are unknown. Fear not, you can still calculate the area of a circle using the circumference. The circumference is the total distance around the circle. The formula for finding the area of a circle using the circumference is:  C = 2πr  Key: Step 1: Solve for ‘r’ We can take this formula for the circumference and use it to find the value of the radius. To do this, the formula will be:  r = C/2π Step 2: Replace ‘r’ in the formula Now, we can replace ‘r’ in the original formula for the circumference with this new expression:  A = π(C/2π)2 Step 3: Simplify the formula This formula is quite confusing to look at, so, let’s simplify it. The simplified version of this formula for the area of a circle is:  A = C2/4π  Now you have a fool-proof formula for calculating the area of a circle.  Let’s put all of this into practice with an example! ****Example 1 — Find the area of a circle using the circumference of 30 m. Give your answer correct to 1 decimal place.**** A = C2/4π  Now, we have to put the measurements of the circle into this formula.  A = 302/4π  A = 900/4π  Area = 71.6 m2 | | Students listen attentively and take down notes. |
| **STEP 4** | **APPLICATION: Find the area of a circle using the radius of 17 cm. Give your answer correct to 1 decimal place.**  Area = π × radius × radius  We know the radius, so put it into the formula above:  Area = π × radius × radius  Area = π × 17 × 17  Area = 907.9 cm2 (to 1d.p.) | | Students ask questions on the topic which the teacher answers. |
| **STEP 5** | **EVALUATION:** the teacher evaluates the students with the following questions:   1. If the radius of a circle is 15cm. Then find its area 2. If the diameter of a circle is 10cm. Then find its area. 3. If the circumference of a given circle is 30cm. Then what will be its area? | | The students answer the questions. |
| **Assignment** If the circumference of a given circle is 30cm. Then what will be its area? **References**  **New concept mathematics for Jss3 by A. A. Arigbabu et al.**  **New general mathematics for Jss3 by M/ F. Macrae et al.** | |  |