Shape Prior Assessment Questions 5 and 6

Objective: I identify the diameter, radius and circumference on a circle.

NC SH 4: illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

Teacher Input Ideas:

- Review question 5 in the prior learning assessment and encourage children to come out and label the circle accurately. Allow children time to explore the vocabulary used in question 5 using a dictionary or a tablet. Create a large display in the classroom together of a labelled circle with the definitions to remind the children of the key terms.
- Create large circles in chalk with hoops or with skipping ropes. Children to label which parts they think are which. Discuss what each part is and discuss ways that the children can remember the key terms, such as making songs or rhymes to help them. Children to measure the diameter and radius of the shapes that they have made. Children to measure the length of the ropes they used to make the circles to find the circumference.
- Children to have compasses and to practise drawing circles accurately. Discuss key terms of a circle and children to label their circles with definitions. Children to practise drawing circles with accurate measurements such as a 5cm radius, etc. Children to work out the diameter using the radius measurement or a ruler. Children to then place pieces of string or wool to make the circumference of the circle and then measure the length of this. Get the children to explore a statement and prove if it is true or false: "The circumference of a circle is always the largest measurement."
- A compass or a piece of chalk attached to a piece of string fixed to a point in the centre, are good ways to show the need for the radius measurement. Could discuss the central point of the circle and how the radius can be an easier measurement to use when creating a circle.

Practice Activities

Purple Practice: most suited for children who made errors in Question 5 and would benefit from exploring the circumference and diameter of a circle first.

Practical: Children to be given different lengths of string or wool. Encourage the children to measure how long the string is with a metre stick or ruler first and make a circle from this. Encourage the children to work out that this is the circumference and record this measurement. The children could investigate 'Is the circumference always larger than the diameter?' Children to prove by finding the circumference and diameter, record and compare measurements. Can they explain why?

When the children are confident with circumference and diameter, model where the radius is and how we can find this. Encourage the children to work out the radius from the measurements they have recorded. Children could then be given a radius measurement and the children to make a circle with the correct diameter.

<u>Green Practice:</u> most suited for children who made errors in Question 5 of the prior learning assessment and are ready to explore the relationship between diameter and radius.

Practical: Discuss how diameter and radius work. Discuss why there is a need for the radius. Introduce a compass. Discuss how they are used and model. Give the children radius measurements to create different sized circles. Children to measure these and draw circles of that radius. What is the diameter? Children to measure the diameter to check that the radius is always half of the diameter and the diameter is always double the radius. Give measurements with decimals too for children to measure. Then give children the diameter measurements and the children must work out the radius and use the compass accurately.

Challenge: Is there a pattern/ relationship between the diameter and the circumference? Encourage the children to investigate this. They could measure different diameters starting from 2 or 3 cm. Children to then place string on top of this and then measure the string to work out the circumference. Children to record results in a table to see if they notice any patterns. Then children could increase the diameter by 1cm. Can they find any patterns? Children may need to apply rounding skills for circumference measurements.

<u>Yellow Practice</u> Most suited for children who need to further develop understanding of the relationship between the radius and diameter and made errors in Question 6 of the prior learning assessment.

On this task sheet the children are provided with images of circles and are required to workout either the radius or diameter based on the measurements they have been provided. The children are then required to apply this knowledge to solve the problem in the challenge. If the radius is 4cm, encourage the children to use this to work out the diameter of the pink circle first and then add 4cm to answer to work out the diameter of the green circle.

Mastery: **fluency and developing open ended problem solving**

The children are given a practical problem to solve. The children are required to make a box to hold 8 oranges that each have a radius of 6cm. The children are first to explore the diameter and how the oranges can be positioned in the box.

What sort of cube, cuboid or prism are they going to make? What will the lengths and measurements need to be to make the faces of the shape? What will the area of the shape be? What will the volume be? Will this fit all 8 oranges? The children may need A3 or A2 paper to create their box. Children may want to draw images and calculate their measurements before making the actual shape. The children can also apply long multiplication methods to find the volume of the boxes.

Answers:

Yellow:

1) Diameter= 7cm

2) Diameter= 10. 6 cm

3) radius = 11cm

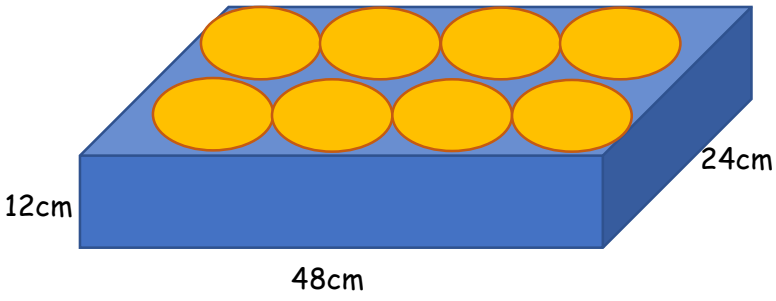
4) radius = 3.25cm

challenge: 12cm

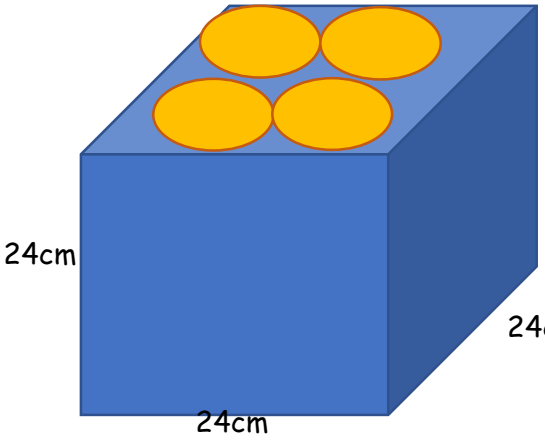
Mastery

There are a few possibilities. Suggestions are:

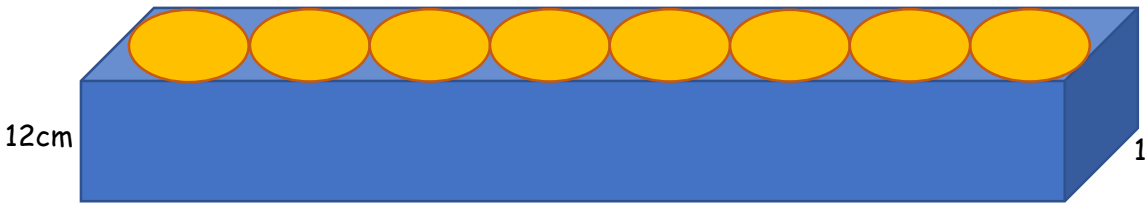
6 x 2 = 12 cm diameter.



volume= 13824 CM



volume = 13824 CM



volume = 13824 CM

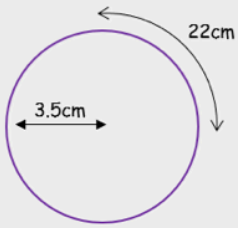
BRICKWORK Mathematics

Yellow Practice

LO: I know the relationship between diameter and radius.

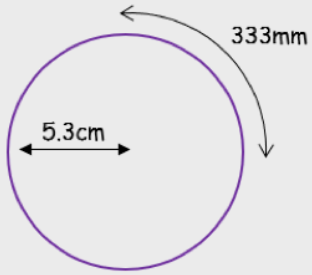
Look at the measurements given on the circles below. Use these to work out the radius and diameter.

1)



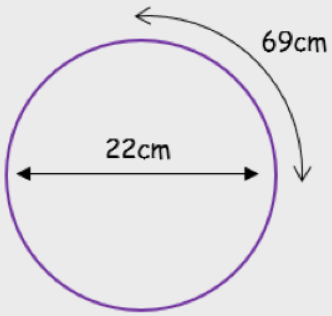
Diameter: cm

2)



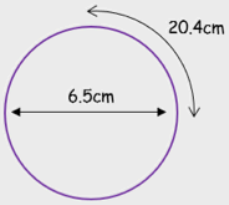
Diameter: cm

3)



Radius: cm

4)



Radius: cm

Challenge: The green circle's diameter is 4cm larger than the diameter of the pink circle. What is the diameter of the green circle?

Green diameter: cm

BRICKWORK Mathematics

Mastery

Larger Problem Solving

Neve wants to make a box to hold 8 oranges she has bought from the supermarket.

Each orange has the radius of 6cm.

Make a 3D box that will hold all 8 oranges.

Think about:

- What is the diameter for each orange?
- What shape will be best?
- How will you create a net for this shape?
- What measurements will you need to use for the edges?
- How will you ensure that your box will hold all the oranges?

Challenge:
What is area of one face of your shape?
What is the volume of the whole box?