

OUT AND ABOUT

OUTDOOR ACTIVITIES FOR KEY STAGE 2 MATHEMATICS

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SHAPE AND SPACE

Circle Time

Learning focus

- Identify and name the parts of a circle (centre, radius, diameter, circumference)
- Measure the diameter and circumference of circles using appropriate tools
- Describe the relationship between the diameter and the circumference of a circle, and between the radius and the circumference of a circle

Key vocabulary

- Circle
- Radius
- Diameter
- Circumference
- Perimeter
- Estimate

Resources

- Pencils, paper and clipboards
- Measuring tape
- Metre sticks
- String or wool
- Chalk
- Scissors
- Camera



Activity

Gather the children in the school grounds and explain that circles will be the focus of the lesson. Use a piece of string and chalk to draw a large circle that the children can all see. To do this, tie the string to the chalk. Mark where you want the centre of the circle to be and ask a child to hold the end of the string on the ground at the centre mark. You can then walk around this fixed point, tracing a circle as you go.



Use a different coloured piece of chalk to highlight the various parts of the circle (radius, diameter, circumference).

Can you recall the special name for the perimeter of a circle?

Which one of these lines shows a diameter? Can you draw another diameter?

How are the diameter and radius related?

Give the children string of different lengths and chalk and ask them to draw circles of different sizes on the school grounds. When the circles are drawn, ask them to label the circumference, radius and diameter and estimate how long they think they are.

About how long do you think the radius of your circle is? And the diameter?

Does that help you estimate the circumference?

Teaching point

A benchmark is a measurement that is meaningful for children. Estimates can be made with greater accuracy if they are based on known benchmarks. In this activity, it is appropriate to encourage the children to draw on familiar benchmarks such as 30 cm (standard ruler) or 1 m (metre stick) as a basis for their estimates.

Explain that rather than measure the circumference directly, the class is going to investigate how many times it contains the diameter or the radius. Focus their attention on one of the drawn circles. For this circle, cut a piece of string that is as long as its diameter and then use the string to count how many times it would fit around the circumference, using chalk to mark the finishing points if it is helpful.

We found that the circumference of this circle was a bit longer than 3 diameters. Do you think this will be true for other circles?

How many times would the radius fit onto the circumference?

Teaching point

For all circles, the circumference is just over three times as long as the diameter (or six times as long as the radius of the circle). *Pi*, written with the symbol, π , is the ratio of the circumference of a circle to its diameter. It is approximately 3.14 or $\frac{22}{7}$.

Give the children string and scissors and ask them to explore the circles they have drawn. Ask them to write statements about what they have found. This can be combined with digital photos to make simple posters or digital records of the activity. Explain that this relationship holds for all circles and that there is a special term to describe this: pi.

Taking ideas further

The class can progress to making formal measurements and aiming to discover an approximation of pi. They can measure the radius, diameter and circumference of a number of circles and investigate their relationship, using a calculator. Measuring and completing the following table for a number of circles should result in an approximation.

Circle	Circumference	Diameter	Circumference \div Diameter
1			
2			
3			

When the children have had enough time to explore this and to relate these findings to their previous outdoor activity, more formal representations of pi can be presented. The formula $C = \pi d$ (circumference is equal to π times the diameter) can be discussed in the context of previous activities.

Assessment opportunities

Are the children able to:

- Name the parts of a circle
- Describe the relationship between the radius and the diameter
- Describe the relationship between the diameter and the circumference, and between the radius and the circumference