CENTRES FOR EXCELLENCE IN MATHS

FE centre resource

Pearson

Lesson plan

Circles

1. Lesson objectives

- Calculate the area and perimeter of circles, semicircles and quadrants (in terms of π or to an appropriate degree of accuracy)
- Explore problems involving the area or perimeter of compound shapes that include circles, semicircles or quadrants
- Apply knowledge learned to exam-style questions

2. GCSE curriculum

Geometry and measures
G9 Identify and apply circle definitions and properties, including centre, radius, chord, diameter, circumference
G17 know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2; calculate: perimeters of 2D shapes, including circles; areas of circles and composite shapes; surface area and volume of spheres, pyramids, cones and composite solids

3. Lesson plan

This is an overview of the lesson. More notes can be found in the notes in the lesson slides.

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Introduction	To remind learners how the formula of circumference of a circle is derived and recall some properties of a circle	10	Ask learners to find the value of π by measuring the circumference and diameter of cylindrical objects of different sizes and rearrange $\boldsymbol{\pi = \frac{C}{d}}$ to find the formula of circumference. Ask learners if they agree with statements about properties of a circle and can they justify their answers.	Slides 2–3 String Ruler Cylindrical or round objects of different sizes
Discuss 1	To highlight some misconceptions regarding the properties of circles	15	Ask learners to analyse three statements about circles which are incorrect. Ask learners to work in pairs to solve problems that require them to work out which circle(s) has the greatest area and which semicircle or quadrant has the greatest circumference.	Slide 4–12 Mini whiteboards Calculators
Explore 1	To address misconceptions and show learners common mistakes	10	Ask learners to work in pairs to identify and correct the errors in working made when calculating the area and circumference of a circle. These should be linked to the starter activity.	Slides 13–16 ‘Spot the mistakes’ handout Calculators

Activity	Purpose of this activity	Time (min)	Guidance	Materials
Discuss 2	To address misconceptions regarding the area or perimeter of compound shapes with circles, semicircles or quadrants	15	Ask learners to solve a problem regarding the area and perimeter of a field with a racetrack.	Slides 17–22 Paper plates Scissors, Rectangular cardboard Calculators
Explore 2	To identify smaller shapes that make up a compound shape so that learners can calculate the area of the compound shapes	20	Provide learners with paper plates or cardboard to help them visualise if necessary.	Slides 23–26 ‘Area of compound shapes’ handout Paper plates Scissors Rectangular cardboard Calculators
Practice question	To practise applying concepts learned to exam questions	15	Ask learners to answer two exam questions and after a few minutes discuss their thinking.	Slides 27–30 'Practice questions’ handout
Review	To review lesson objectives and recap key learning points	5	Review the lesson objectives, summarise the key ideas from the lesson and encourage learners to give feedback.	Slide 31