Subject	Year	Month
Mathematics	9	January

Topic:

CIRCLES, SECTORS AND CYLINDERS — 6 LESSONS

Content (Intent)

Prior Learning

Y8 April

- the number π
- formulae for area and circumference of a circle
- **only** sectors that are Semi and quarter circles
- Compound areas INCLUDING rectangles, parallelograms, triangles and trapezia
- Volume of cylinders

Future Learning

Volume cone & Sphere
Surface area of cone and sphere

Objectives

- RECAP circle definitions and properties + INTRODUCE tangent, arc, sector and segment
- Understanding the difference between answering in terms of pi or rounding a value.
- Calculate the arc length and the area of a sector,
  - ✓ RECAP Semi-circle and quarter circle
  - ✓ INTRODUCE Other angled sectors
- Calculate the surface area of a right prism
- Calculate the surface area of a cylinder (could also challenge with sector as cross section instead of full circle)

For teaching purposes

Possible Questions

- Show me a sector with area 25π. And another. And another …
- volume of a prism versus surface area of a prism.

Misconceptions

- may work out $(\pi \times r)^2$ when finding the area of a circle
- may use the sloping height when finding cross-sectional areas that are parallelograms, triangles or trapezia
- may confuse the concepts of surface area and volume
- may not include the lengths of the radii when calculating the perimeter of an arc

Pedagogical notes (implementation)

Surface area: some students may only find the area of the 3 'distinct' faces
Students must experience right-angled triangles **in different orientations** to appreciate the hypotenuse is always opposite the right angle.

Common approaches
visualize the shapes of all the faces of a prism for surface area.
area posters

How will understanding be assessed & recorded (Impact)

9BAM7 Exact calculations with pi

End of term Assessment in February
Exams in May

How can parents help at home?

MathsWatch clips (Qualification KS3)
G2, G22a, G22b, G25a, G25b

Further reading/discussion

Reading / Enrichment

KM: The language of circles

KM: Stick on the Maths: Right Prisms

NRICH: Curvy Areas NRICH: Changing Areas, Changing Volumes

Literacy

Circle, Pi
Radius, diameter, chord, circumference, arc, tangent, sector, segment
(Right) prism, cylinder
Cross-section

Abbreviations of units in the metric system: km, m, cm, mm, mm^2, cm^2, m^2, km^2, mm^3, cm^3, km^3

Numeracy Links

Careers Links

Architect
Landscape Gardner