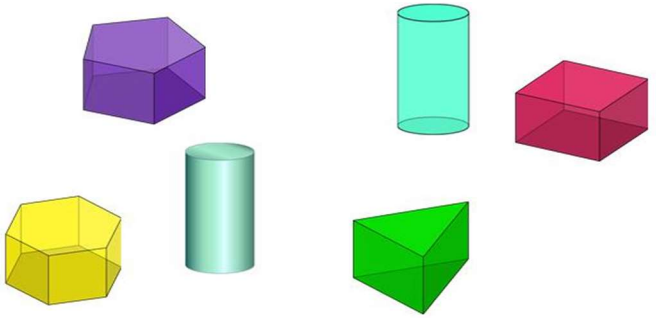
# Unit 1 – Calculating with Space – Knowledge Organiser

| Objective |
|---|
| Have knowledge of Parts of the Circle, Prisms and Cylinders. |
| Find Circumference and Area of Circles and Solve Circle Problems. |
| Know how to draw: Nets, Plans, Elevation and Isometric representation. |
| Calculate the Surface Area of Prisms and Cylinders. |
| Calculate the Volume of Prisms and Cylinders. |



## Key Facts

**Circle Circumference:** $C = \pi d$ or $C = 2\pi r$

Can you see the link? $d = 2r$

**Circle Area:** $A = \pi r^2$ This is means $\pi \times r \times r$

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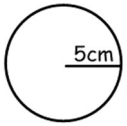
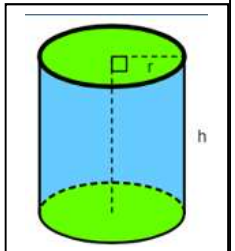
**Example:**

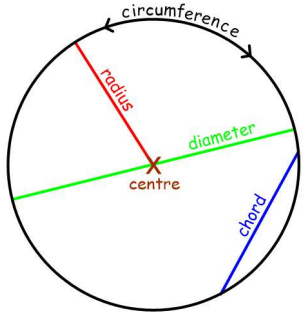



| Area | Circumference |
|---|---|
| $= \pi r^2$ | $= 2\pi r$ |
| $= \pi \times 5 \times 5$ | $= 2 \times \pi \times 5$ |
| $= 25\ \pi\ cm^2$ | $= 10\ \pi\ cm$ |
| $\approx \underline{78.5\ cm^2}$ | $\approx \underline{31.4cm}$ |

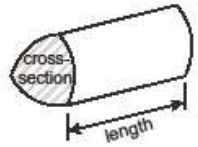



$V = \pi r^2 h$

**The parts of a circle:**



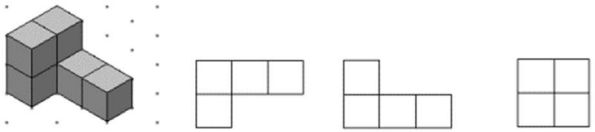

**Volume with constant cross-section:**



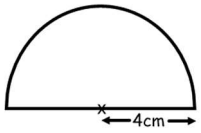

V = Area of cross section x length

**Isometric drawing with Plan and elevations:**

Isometric Plan Front elevation Side elevation



## Key Concept Check




- What is the area and perimeter of this semicircle?
- If this is a picture of the cross-section of a half-pipe of length 0.2m. What would the volume be?
- Can you draw the net of a square based pyramid?

## Key words used in this unit:

**Circumference** – the distance around a circle (its perimeter)

**Radius** – the distance from the centre of a circle to any point on its circumference

**Diameter** – a chord of a circle that passes through the centre

**Pi** - The ratio of the circumference of a circle to the length of its diameter – 3.14…

**Cross-section** – the shape formed when a plane cuts through a solid

**Prism** – A solid with a uniform polygonal cross section

**Cylinder** – a solid with a uniform circular cross section

**Face** – Individual flat surface of a 3D shape

**Edge** – Line segment where 2 faces meet on a 3D shape

**Vertex (plural vertices)** – Corner of a shape where edges meet

**Net** – 2D shape formed from a 3D shape opened out and laid flat