



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 8 Support – 3D Shapes, Surface Area and Volume

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to identify 3D shapes	- Students will know the names of prisms, pyramids and spheres. - Students will know how to determine the number of faces, edges and vertices from 3D solids. Opportunity for challenge: - Students will know how to sketch 3D shapes.	Prism – A solid object with two identical ends and flat sides Pyramid - a 3D solid where the sides are triangles meeting at the apex and the base is a polygon. Vertex (plural vertices) – corner Face – in maths, a face is a flat surface of a solid object Polygon – a closed shape with straight sides Edge – a line segment where two faces meet The Fryer model can be used here.	Students need to identify 2D shapes and their properties.		
To learn how to draw and identify nets of 3D shapes.	- Students will know how to sketch the nets of prisms. - Students will know how to sketch the nets of pyramids. - Students will know how to identify a 3D shape from its net by looking at the faces on the net. - Students will know how to use isometric grids to sketch 3D solids.	Net – net means a pattern that you can cut and fold to make a model of a solid shape.	Students need to identify 3D shapes.		
To learn how to draw plans and elevations of 3D shapes.	- Students will identify front, side and plan elevations of 3D solids. - Students will draw the front, side and plan elevations of 3D solids with cubes using a 1cm grid. Opportunity for challenge: - Students will draw the front, side and plan elevations of 3D solids with accurate measurements using a 1cm grid.	Plan – A drawing of something as viewed from above Elevation – the view of a 3D shape when it is looked at from the side or from the front.	Students need to identify and draw 2D shapes.	Steps To Success – Plans and Elevations Step 1: Identify the direction that you are looking from. Step 2: Draw the face/view you can see of the object from that direction.	
To learn how to calculate the surface area of cubes and cuboids.	- Students will know how to find the surface area of a 3D solid using the net. - Students will know how to find the surface area of cubes. Students will know how to find the surface area of cuboids. Opportunity for challenge: - Students will know how to find the surface area of triangular prisms.	Surface area - the total area of all of the faces of a 3D solid added together.	Students need to know how to find the area of squares and rectangles.	Steps To Success – Surface area of cubes Step 1: Find the area of one face, to do this we calculate length by width Step 2: Multiply the area of one face by the number of faces the shape has. A cube has 6 identical faces. Step 3: Write the units for area. Steps To Success – Surface area of Cuboid Step 1: Calculate the area of each of the faces of the shape. It is important to remember how many faces a cuboid has. Step 2: To find the total surface area add the area of each face together. Step 3: Write the units for area. *Sometimes the faces can either be rectangles or squares, it is important to consider this when completing the calculations. *	

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to calculate the volume of cubes and cuboids.	- Students will know how to find the volume of prisms when the area of the cross-section is given. - Students will know how to find the volume of cubes. - Students will know how to find the volume of cuboids. Note: Please use $\text{volume} = \text{area of cross-section} \times \text{length}$ rather than just multiply all of the numbers together.	Volume – the amount of space inside a 3D object Prism – A solid object with two identical ends and flat sides	Students need to know how to find the area of squares and rectangles.	Steps To Success – Volume of Cubes/Cuboids Step 1: Find the area of the cross section – this is the square or rectangle at the front. Step 2: Multiply the area of the square or rectangle by the depth of the shape. Step 3: Write the units for volume.	
To learn how to calculate the volume of triangular prisms.	- Students will know how to find the volume of triangular prisms. Opportunity for challenge: - Students will know how to find the volume of compound shapes. Note: Please use $\text{volume} = \text{area of cross-section} \times \text{length}$ rather than just multiply all of the numbers together.	Compound Solid - a solid that is made up of 2 or more solids.	Students need to know how to find the area of triangles.	Steps To Success – Volume of Triangular Prisms Step 1: Find the area of the cross section – this is the triangle at the front. Step 2: Multiply the area of the triangle by the depth of the shape. Step 3: Write the units for volume. Steps to Success - Find the Volume of Compound Prisms To calculate the volume of a compound prism, follow these steps: Step 1: Identify the Cross Section Look at the end face (cross section) of the prism.. The cross section may be made up of more than one simple shape (for example, an L-shape made of two rectangles). Step 2: Split the Cross Section Into Simpler Shapes Divide the cross section into basic shapes like rectangles or triangles. Step 3: Find the Area of Each Simple Shape Use the appropriate area formulas: - Rectangle: $\text{Area} = \text{length} \times \text{width}$ - Triangle: $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$ Step 4: Add the Areas Together Add the areas of all the shapes you identified. This gives you the total cross-sectional area. Step 5: Multiply the Total Area by the Depth (or Length) Multiply the total area by the depth (how far the cross section extends) to find the volume. Formula: Volume = Total Cross-Sectional Area $\times$ Depth	

Mini-Assessment 11