The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 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.	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.	See Cultural capital reading	
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 use isometric grids to sketch 3D solids. **Opportunity for challenge:** • Students will know how to identify a 3D shape from its net by looking at the faces on the net.	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 know that an elevation means a 2D drawing of a 3D shape from different viewpoints. • Students will draw the front, side and plan elevations of 3D solids with cubes 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 what 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.	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.***	
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 volume = area of cross-section x 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 a cube To calculate the volume of a cube you must substitute the values into the formula **volume = length x width x height**, remembering that all lengths of the square are the same size.	

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				<u>Steps To Success – Volume of Cuboids</u> **Step 1:** Find the area of the cross section – this is the square or rectangle at the front. **Step 2:** Multiple 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. **Note: Please use volume = area of cross-section x length rather than just multiply all of the numbers together.**		• Students need to know how to find the area of triangles.	**<u>Steps To Success – Volume of Triangular Prisms</u>** **Step 1:** Find the area of the cross section – this is the triangle at the front. **Step 2:** Multiple the area of the triangle by the depth of the shape. **Step 3:** Write the units for volume.	
Mini-Assessment 11					