The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 Core – 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 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 Cubes/Cuboids** **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. **Opportunity for challenge:** • Students will know how to find the volume of compound shapes. **Note: Please use volume = area of cross-section x 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:** Multiple 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: Area = length × width • Triangle: Area = 1/2 × base × 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 × Depth**	
Mini-Assessment 11					