The Sutton Academy

Knowledge Rich Curriculum Plan

Year 9 Prime – 3D Shapes, Surface Area and Volume

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
To learn how to draw plans and elevations of 3D shapes.	• Students will know how to use isometric grids to sketch 3D solids. • 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. • Students will draw the front, side and plan elevations of 3D solids with accurate measurements using a 1cm grid. • Students will know how to sketch a 3D solid using the front, side and plan elevations.	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 be able to draw and identify 3D shapes. • Students need to be able to measure and draw lines with a ruler.	Mini-Assessment 9
To learn how to calculate the surface area of cubes, cuboids and triangular prisms.	• Students will know how to find the surface area of a 3D solid using the net. Students will know that surface area means the total area of the surface of a three-dimensional object. • Students will know that the surface area is the total area of each face of a 3D solid. • Students will know how to find the surface area of cubes. • Students will know how to find the surface area of cuboids. • Students will know how to find the surface area of triangular prisms. • Students will know how to find the surface area of compound solids involving prisms. • Students will know that a compound solid means a solid that is made up for 2 or more solids. • Students will know how to solve problems involving the surface area of prisms.	Surface area - the total area of all of the faces of a 3D solid added together	• Students need to be able to draw the net of a 3D shape. • Students need to be able to use basic mathematical operations such as multiplication and addition. • Students need to be able to find the area of 2D shapes.	Mini-Assessment 9
To learn how to calculate the surface area of a cylinder.	• Students will know how to find the surface area of cylinders. • Students will know how to solve problems involving the surface area of cylinders.		• Students need to be able to draw the net of a 3D shape. • Students need to know how to find the area and circumference of circles.	Mini-Assessment 9
To learn how to calculate the volume of prisms.	• Students will know that the volume is the amount of 3-dimensional space a 3D solid occupies. Students will know that volume means the amount of three-dimensional space something takes up. • Students will know how to find the volume of cubes. • Students will know how to find the volume of cuboids. • Students will know how to find the volume of triangular prisms. • Students will know how to find the volume of compound shapes. • Students will know how to solve problems involving the volume of prisms. **Opportunity for challenge:** • Students will know how to use inverse operations to find the side of a prism using volume.	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 multiple and divide numbers. • Students need to be able to find the area of 2D shapes.	Mini-Assessment 9
To learn how to calculate the volume of cylinders.	• Students will know how to find the volume of cylinders. • Students will know how to solve problems involving the volume of cylinders. • Students will know how to use inverse operations to find the radius or diameter of a cylinder using volume. • Students will know how to work backwards from the volume of a cylinder to calculate its height.		• Students need to know how to find the volume of prisms. • Students need to know how to find the area of a circle.	Mini-Assessment 9

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
To learn how to calculate the volume of pyramids, cones and spheres.	• Students will know how to find the volume of pyramids. • Students will know how to find the volume of cones. • Students will know how to find the volume of spheres and hemi-spheres. **Opportunity for challenge:** • Students will know how to find the volume of compound solids involving pyramids, cylinders, cones and hemi-spheres		• Students need to be able to substitute into formulae.	Mini-Assessment 9
To learn how to calculate with density, mass and volume.	• Students will know how to calculate density using the mass and volume. • Students will know how to calculate mass using the density and volume. • Students will know how to calculate volume using the density and mass. • Students will know how to calculate the mass, density or volume without converting any units. • Students will know how to calculate the mass, density or volume converting units when necessary. **Opportunity for challenge:** • Students will know how to solve problems involving mass, density and volume.		• Students will need to know how to multiply and divide numbers. • Students will need to know how to substitute values into formulae.	Mini-Assessment 9
To learn how to calculate speed, distance and time.	• Students will know that $Speed = \frac{distance}{time}$ • Students will know that $Time = \frac{distance}{speed}$ • Students will know that $Distance = Speed \times Time$ • Students will know how to make simple conversions for minutes to decimal hours - they will know that 30 minutes is 0.5 hours and 15 minutes is 0.25 hours. • Students will know how to calculate speed, distance or time given the two other variables including where the time needs to be converted into a decimal number of minutes or hours. • Students will know how to solve problems involving speed, distance and time.		• Students need to know how to convert time between minutes and hours.	Mini-Assessment 9
To learn how to interpret a distance-time graph.	• Students will know how to make simple interpretations from a distance-time graph. • Students will know how to find distances and times from a distance-time graph. • Students will know how to complete a distance-time graph from a worded scenario. • Students will know how to draw a complete distance-time graph from a worded scenario. • Students will know how to find the distance by finding the area under the graph. • Students will know how to interpret the speed within each section of the graph by looking at the steepness of the line. • Students will know how to find the speed within each section of the distance-time graph.			Mini-Assessment 9