The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Higher+ Geometry 4

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this…*	Feedback
To learn how to calculate the surface area of prisms and cylinders	• Students will know how to find the surface area of prisms including cubes, cuboids and triangular prisms • Students will know how to find the surface area of other prisms including compound prisms. • Students will know how to find the surface area of cylinders. Students will know how to calculate this in terms of π as well as by using a calculator. • Students will know how to solve problems involving the surface area of prisms and cylinders	**Surface area** - the total area of all of the faces of a 3D solid added together **Prism** – A solid object with two identical ends and flat sides **Compound Solid** - a solid that is made up of 2 or more solids.	•	• Students need to be able to draw nets of shapes and identify nets of different 3D objects • Students need to know how to calculate the area of squares, rectangles, triangles and compound shapes • Students need to know how to calculate area and circumference of circles	
To learn how to calculate the surface area of cones and spheres	• Students will know how to calculate the surface area of a sphere using the formula $Surface\ area\ of\ a\ sphere = 4\pi r^2$ • Students will know how to calculate the curved surface area of a cone using the formula $Curved\ surface\ area\ of\ a\ cone = \pi rl$ • Students will know that to calculate the total surface area for a cone they need to add on the area of the circle on the base • Students will know to use Pythagoras' theorem to calculate missing lengths required for the curved surface area of cone • Students will know how to calculate the surface area of hemispheres and quarter-spheres • Students will know how to work backwards from the surface area of a cone or sphere to find missing lengths. • Students will know how to solve problems involving the surface area of cones and spheres • Students will know how to calculate the surface area of cones and spheres, leaving their answers in terms of π.		•	• Students need to be able to substitute into formulae • Students need to be able to use Pythagoras' theorem to calculate missing lengths in right-angled triangles • Students need to be able to calculate the area of a circle	

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this…*	Feedback
To learn how to calculate the volume of prisms and cylinders	• Students will know that: Volume of a Prism = Area of Cross Section x Length • Students will know how to find the volume of cubes, cuboids, triangular prisms and compound prisms by calculating the area of the cross-section and multiplying it by the length of the prism • Students will know how to find the volume of cylinders. Students will know how to leave their answers for this in terms of π. • Students will know how to work backwards from the volume of a prism to find missing lengths • Students will know how to work backwards from the volume of a cylinder to calculate its height or the radius/diameter Students will know how to solve problems involving the volume of prisms and cylinders	**Volume** – the amount of space inside a 3D object **Prism** – A solid object with two identical ends and flat sides **Compound Solid** - a solid that is made up of 2 or more solids.	•	• Students need to be able to calculate the area of squares, rectangles, triangles, compound shapes and circles	
To learn how to calculate the volume of pyramids and cones	• Students will know how to find the volume of pyramids and cones. • Students will know how to find the volume of cones, leaving their answers in terms of π. • Students will know how to work backwards from the volume of a pyramid to calculate missing lengths • Students will know how to find the volume of cones. • Students will know how to work backwards from the volume of a cone to calculate its height, radius or diameter • Students will know how to find the volume of compound solids and solve problems involving the volume of pyramids and cones		•	• Students will need to know how to calculate the volume of cuboids, cubes and cylinders • Students need to be able to find 1/3 of a number • Students need to be able to divide an integer by 1/3 • Students will need to know how to substitute numbers into formulae	
To learn how to calculate the volume of a sphere	• Students will know how to find the volume of spheres and hemi-spheres. • Students will know how to find the volume of sphere and hemi-spheres, leaving their answers in terms of π. • Students will know how to work backwards from the volume of a sphere to calculate its radius or diameter		•	• Students need to be able to substitute into formulae. • Students need to be able to multiply an integer by 4/3 • Students need to be able to divide an integer by 4/3	

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To learn how to calculate Density, Mass and Volume	• Students will know how to calculate mass, density or volume using two variables. • Students will know how to combine the densities, mass and volumes of two materials/liquids to make a third material/liquid. Students will know how to find missing values from a liquid using the density, mass or volumes for the other liquids. • Students will know how to solve more complex problems involving density, mass and volume	**Density** – a measurement of the amount of a substance contained in a certain volume **Mass** – the weight of an object	•	• Students need to be able to convert units for mass • Students need to be able to convert units for length and understand how to convert units for volume	