****

**Knowledge Rich Curriculum Plan**

Year 10 Intermediate – Geometry 3



| **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 identify 3D shapes and draw and recognise nets** | * Students will know how to determine the number of faces, edges and vertices for 3D solids. * Students will know that a face is the individual flat surface of a 3D solid. * Students will know how to identify a 3D shape from its net * Students will know how to draw nets of 3D solids. | **Prism** – A solid object with two identical ends and flat sides  **Vertex (plural vertices) –** corner  **Net** – net means a pattern that you can cut and fold to make a model of a solid shape.  **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 | * Students will need to be able to name different prisms, pyramids and spheres. |  |
| **To learn how to identify and draw plans and elevations from shapes and draw shapes from plans and elevations** | * 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. * Students will know how to sketch a 3D solid using the front, side and plan elevations. * Students will know how to use isometric grids to sketch 3D solids. | **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 recognise 2D shapes |  |
| **To learn how to calculate the surface area of prisms** | * 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 solve problems involving the surface area of 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 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 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 pyramids and spheres** | * Students will know how to find the surface area of pyramids. * Students will know how to find the surface area of sphere and hemi-spheres. * Students will know how to find the surface area of compound solids involving pyramids spheres, leaving their answers in terms of π where necessary. |  | * Students need to be able to substitute into formulae. * Students need to be able to find the area of circles. * Students need to know that π = 3.142 and be able to use the π button on the calculator. |  |
| **To learn how to calculate the volume of prisms** | * 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 solve problems involving the volume of prisms | **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 and compound shapes |  |
| **To learn how to calculate the volume of cylinders** | * 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 cylinder to calculate its height or the radius/diameter * Students will know how to solve problems involving the volume of cylinders |  | * Students need to be able to calculate the area of circles |  |
| **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. |  | * Students need to be able to substitute into formulae. * Students need to be able to multiply an integer by 1/3 and 4/3 |  |
| **To learn how to calculate Density, Mass and Volume** | * Students will know how to convert between units of density. * Students will know how to calculate mass, density or volume using two variables. Students will know that density means a measure of how much matter is in a certain volume. * Students will know how to find the mass or density given one of the variables and by working out the volume. Students will know that a variable means a symbol for a value we do not know yet. It is usually a letter like x or y. |  | * 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 |  |
| **To learn how to calculate speed, distance and time** | * Students will know that * Students will know that * Students will know that * Students will know the formula triangle for speed, distance and time * Students will know how to solve basic SDT problems where the time is an integer number of hours and all units correspond * 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 calculate speed, distance or time using two variables where they need to convert time written in hours and minutes to a decimal * Students will know how to calculate average speed given distance and time for multi-stage journeys * Students will need to know how to solve more complex problems involving speed, distance and time | **Speed** – the rate at which someone or something moves or operates or is able to move or operate. | * Students should already know how to convert from minutes to hours and minutes |  |
| **To learn how to draw and interpret distance-time graphs** | * Students will know how to draw distance–time graphs. * Students will know how to work out time intervals for graph scales. * Students will know how to find the total time taken of individual sections of a distance-time graph. * Students will know how to find the speed of individual sections of a distance-time graph. * Students will know how to find the total distance in individual sections of a distance-time graph. * Students will know how to interpret information presented in a range of linear and non-linear graphs; * Students will know how to interpret graphs with negative values on axes; * Students will know how to interpret gradient as the rate of change in distance–time and speed–time graphs, graphs of containers filling and emptying, and unit price graphs. | Gradient – the change in height divided by the horizontal distance. | * Students need to know how to find the difference between two times |  |