Year 9 Maths Learning Journey

Autumn Term 4

Constructing in 2 and 3 dimensions: Three dimensional shapes

Core knowledge	Reference
Know names of 2D and 3D shapes "What is a dimension?"	Worksheet
Recognise prisms (including language of edges and vertices) "How do we know if a solid shape is a prism?"	Worksheet
Accurate nets of cuboids and other 3D shapes "How many sides does each edge connect to?"	Worksheet
Sketch and recognise nets of cuboids and other 3D shapes "How many different nets are there for the shape?"	Worksheet
Plans and elevations "What can you see looking at the shape from the front/side/above?"	Worksheet
Find area of 2D shapes (R) "Which dimensions do you need in order to find the area of the shape?"	Worksheet
Surface area of cubes and cuboids "What is the same/different about the faces of cubes and cuboids?"	Worksheet
Surface area of triangular prisms "Are any of the faces the same?"	Worksheet
Surface area of a cylinder "How do you find the are of the curved face?"	Worksheet
Volume of cubes and cuboids "What is the difference between finding the volume and finding the surface area of a cube of cuboid?"	Worksheet
Volume of other 3D shapes - prisms and cylinders "What is the area of the constant cross-section?"	Worksheet
Explore volumes of cones, pyramids and spheres (H) "What is the perpendicular height of the pyramid/cone?"	Worksheet

Learning Checkpoints

LC Title	Completed	Dirt
Three dimensional shapes		

Key Vocabulary:
Area: A measure of the size of any plane surface. Area is usually measured in square units e.g. square centimetres (cm2), square metres (m2).
Circumference: The distance around a circle (its perimeter).

Commutative: Addition and multiplication of real numbers are commutative where a + b = b + a and a × b = b × a for all real numbers a and b.
Compound: Any shape that is made up of two or more geometric shapes.
Cone: A cone is a 3-dimensionsl shape consisting of a circular base, a vertex in a different plane, and line segments joining all the points on the circle to the vertex.
Constant: A number or quantity that does not vary. Example: in the equation y = 3x + 6, the 3 and 6 are constants, where x and y are variables.
Cross-section: In geometry, a section in which the plane that cuts a figure is at right angles to an axis of the figure.
Cube: In geometry, a three-dimensional figure with six identical, square faces. Adjoining edges and faces are at right angles.
Cuboid: A three-dimensional figure with six rectangular faces.
Curved surface area: The curved boundary of a 3-D solid, for example; the curved surface of a cylinder between the two circular ends.
Cylinder: A three-dimensional object whose uniform cross-section is a circle.
Dimensions: measure of the size of its covering properties.
Edge: A line segment, joining two vertices of a figure.
Face: One of the flat surfaces of a solid shape.
Formula: An equation linking sets of physical variables. **Plural:** formulae.
Front elevation: Plans and elevations are a way of representing a 3-dimensional object. We have three views of the 3D shape, the front of the shape is called the front elevation.
Height: The vertical distance from the top to the object's base.
Isometric: Where distances between points stay the same after a transformation.
Length: The extent of a line segment between two points.
Net: A plane figure composed of polygons which by folding and joining can form a polyhedron.
Open/closed: A set is open if every point in is an interior point. A set is closed if it contains all of its boundary points.
Perpendicular: A line or plane that is at right angles to another line or plane
Perpendicular height: the height of the pyramid measured at a right angle from the base.
Perspective: The art and mathematics of realistically depicting three-dimensional objects in a two-dimensional plane
Plan: Plans and elevations are a way of representing a 3-dimensional object. We have three views of the 3D shape, the top of the shape is called the plan elevation.
Polygon: A closed plane figure bounded by straight lines.
Prism: A solid bounded by two congruent polygons that are parallel (the bases) and parallelograms (lateral faces) formed by joining the corresponding vertices of the polygons.
Pyramid: A solid with a polygon as the base and one other vertex, the apex, in another plane. Each vertex of the base is joined to the apex by an edge. Other faces are triangles that meet at the apex.
Side elevation: Plans and elevations are a way of representing a 3-dimensional object. We have three views of the 3D shape, the side of the shape is called the side elevation.
Solid: A three dimensional (3D) object. The 3 dimensions are called width, depth and height.
Sphere: A closed surface, in three-dimensional space, consisting of all the points that are a given distance from a fixed point, the centre.
Surface area: The total area of the surface of a three-dimensional object. Example: the surface area of a cube is the area of all 6 faces added together.
Tetrahedron: A solid with four triangular faces. A regular tetrahedron has faces that are equilateral triangles. **Plural:** tetrahedra
Vertex: The point at which two or more lines intersect. **Plural:** vertices.
Width: The distance from side to side.