Lode Heath School

Mathematics Department

Year 10 Higher

Assignment Title	Unit 1: Area and volume	Set	Autumn

Summary of Unit 1	Key Words
Find the area and perimeter of 2D shapes. Calculate the surface area and volume of 3D shapes. Solve problems involving parts of shapes or a combination of shapes. Convert units and understand boundaries of measurement.	Triangle, rectangle, parallelogram, trapezium, area, perimeter, formula, length, width, prism, compound, measurement, polygon, cuboid, volume, nets, isometric, symmetry, vertices, edge, face, circle, segment, arc, sector, cylinder, circumference, radius, diameter, pi, composite, sphere, cone, capacity, hemisphere, segment, frustum, bounds, accuracy, surface area.

Prior Knowledge:

1) Name as many 3D shapes as you can.

2) Which of the following are metric units? *cm miles kg L inches ft km pounds*

3) What is the volume of cuboid with the dimensions 3m, 5m and 10m?

4) What is Pythagoras' Theorem and when do you use it?

5) Sketch a net of a cube.

LEARNING JOURNEY

Level	Task Description
3-5	**1.1 Perimeter and area** Find the perimeter and area of compound shapes. Recall and use the formula for the area of a trapezium.
4-7	**1.2 Units and accuracy** Convert between metric units of area. Calculate the maximum and minimum possible values of a measurement.
4-6	**1.3 Prisms** Convert between metric units of volume. Calculate volumes and surface areas of prisms.
4	**1.4 Circles** Calculate the area and circumference of a circle. Calculate area and circumference in terms of π.
4-6	**1.5 Sectors of circles** Calculate the perimeter and area of semicircles and quarter circles. Calculate arc lengths, angles and areas of sectors of circles.
5-7	**1.6 Cylinders and spheres** Calculate volume and surface area of a cylinder and a sphere. Solve problems involving volumes and surface areas.
5-7	**1.7 Pyramids and cones** Calculate volume and surface area of pyramids and cones. Solve problems involving pyramids and cones.

Assignment Title	Unit 2: Equations and inequalities	Set	Autumn

Summary of Unit 2	Key Words
Be able to solve quadratic equations (including the quadratic formula). Solve linear and quadratic simultaneous equations. Solve inequalities.	Quadratic, linear, solve, substitution, formulae, simultaneous, set notation.

Prior Knowledge:

1. Solve: a) $2x + 4 = 19$ b) $5(2x + 3) = 30$ c) $2x^2 = 128$

2. Factorise: a) $x^2 + 6x + 5$ b) $x^2 + 4x - 12$ c) $2x^2 - 10x + 12$ d) $x^2 - 81$

3. Write down 3 numbers that would satisfy $x \geq 3$

LEARNING JOURNEY

Level	Task Description
5-7	**2.1 Solving quadratic equations 1** Find the roots of quadratic functions. Rearrange and solve simple quadratic equations.
6-7	**2.2 Solving quadratic equations 2** Solve more complex quadratic equations. Use the quadratic formula to solve a quadratic equation.
7-8	**2.3 Completing the square** Complete the square for a quadratic expression. Solve quadratic equations by completing the square.
5-6	**2.4 Solving simple simultaneous equations** Solve simple simultaneous equations. Solve simultaneous equations for real-life situations.
6-8	**2.5 More simultaneous equations** Use simultaneous equations to find the equation of a straight line. Solve linear simultaneous equations where both equations are multiplied. Interpret real-life situations involving two unknowns and solve them.
7-8	**2.6 Solving linear and quadratic simultaneous equations** Solve simultaneous equations with one quadratic equation. Use real-life situations to construct quadratic and linear equations and solve them.
4-6	**2.7 Solving linear inequalities** Solve inequalities and show the solution on a number line and using set notation.

Assignment Title	Unit 3: Multiplicative reasoning	Set	Autumn

Summary of Unit 3	Key Words
Use reasoning to work with multiplication and percentages, including ratio and proportion. Calculate the result of repeated percentage calculation over a period of time. Use compound measures, including time and speed, in real-life calculations.	Ratio, proportion, speed, distance, time, compound, interest, rate, direct, indirect, growth, decay.

Prior Knowledge:

1) Find the following:

a) 20% of £34 b) 17% of 40 c) 0.5% of £120 d) 12% of 1km

2) Simplify the following ratios:

a) 4:6 b) 12:8 c) 3:12:9

3) Knowing that 12 inches = 1 foot, what are the following:

a) 4 ft = …..inches b) 5.5 feet = …… inches c) 58 inches = ……feet and…..inches

LEARNING JOURNEY

Level	Task Description
5-6	**3.1 Growth and decay** Find an amount after repeated percentage changes. Solve growth and decay problems.
4-6	**3.2 Compound measures** Calculate rates. Convert between metric speed measures. Use a formula to calculate speed and acceleration.
5-7	**3.3 More compound measures** Solve problems involving compound measures.
4-7	**3.4 Ratio and proportion** Use relationships involving ratio. Use direct and indirect proportion.