Lode Heath School

Mathematics Department

**Year 10 Foundation
Autumn Term**

Assignment Title	Unit 1: Perimeter, area and volume 1	Set	Autumn

| Summary of Unit 1	Key Words
Find the perimeter, area and volume of a range of common shapes. Convert units of measure.	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.

Prior Knowledge

1. Calculate:

   a) $16 \times 3 =$ b) $14 \times 2 =$

   c) $6 \times 6 \times 6 =$ d) $8 \times 4 \times 5 =$

2. Find the area: a)   b)

   4cm

   4cm

   3cm

   12cm
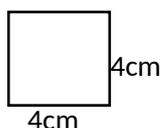
3. Draw any net that would make a cube

LEARNING JOURNEY

Level	Task Description
2-3	**1.1 Rectangles, parallelograms and triangles** Calculate the perimeter and area of rectangles, parallelograms and triangles. Estimate lengths, areas and costs. Calculate a missing length, given the area.
2-3	**1.2 Trapezia and changing units** Calculate the area and perimeter of trapezia. Find the height of a trapezium given its area. Convert between area measures.
2-3	**1.3 Area of compound shapes** Calculate the perimeter and area of shapes made from triangles and rectangles. Calculate areas in hectares, and convert between ha and m^2.
2-3	**1.4 Surface area of 3D solids** Calculate the surface area of a cuboid. Calculate the surface area of a prism.
3	**1.5 Volume of prisms** Calculate the volume of a cuboid. Calculate the volume of a prism.
3-4	**1.6 More volume and surface area** Solve problems involving surface area and volume. Convert between measures of volume.

Assignment Title	Unit 2: Quadratic equations and graphs	Set	Autumn

Summary of Unit 2	Key Words
Expand single and double brackets, including squaring single brackets. Recognise quadratic expressions. Recognise and plot and use graphs of quadratic functions. Solve quadratic equations. Factorising quadratic expressions.	Square, quadratic, expression, equation, brackets, expand, plot, factorise, algebra, multiply, graph, simplify, negative, substitute, like terms, factor, square root, solve.

Prior Knowledge:

1. What is the square of -4?

2. $y = 2x + 5$. What is y when $x = 3$?

3. Expand (and simplify): a) $3(x - 7)$ b) $x(x + 1)$ c) $2(x - 4) + 5(x + 2)$

4. What is the value of $\sqrt{36}$? (2 solutions)

LEARNING JOURNEY

Level	Task Description
4-5	**2.1 Expanding double brackets** Multiply double brackets. Recognise quadratic expressions. Square single brackets.
5	**2.2 Plotting quadratic graphs** Plot graphs of quadratic functions. Recognise a quadratic function. Use quadratic graphs to solve problems.
5	**2.3 Using quadratic graphs** Solve quadratic equations $ax^2 + bx + c = 0$ using a graph. Solve quadratic equations $ax^2 + bx + c = k$ Using a graph.
4-5	**2.4 Factorising quadratic expressions**
4-5	**2.5 Solving quadratic equations algebraically**

Assignment Title	Unit 3: Multiplicative reasoning	Set	Autumn

Summary of Unit 3	Key Words
Work out real life problems involving percentages. Solve problems involving speed and density. Use ratio and proportion involved in measures.	Ratio, proportion, best value, proportional change, compound measure, density, mass, volume, speed, distance, time, density, mass, volume, pressure, acceleration, velocity, inverse, direct.

Prior Knowledge:

1) If speed = distance ÷ time, how would you calculate distance travelled if you know the speed and time taken?

2) If the mass of an apple is 120g and the volume is 20cm^3. What is its density in g/cm^3?
Clue: Density = mass ÷ volume

3) What is 30% of £50?

4) Simplify: a) 15:25   b) 12:16   c) 35:21

LEARNING JOURNEY

Level	Task Description

3-5	**3.1 Percentages**
	        Calculate a percentage profit or loss.
	        Express a given number as a percentage of another in more complex situations.
	        Find the original amount given the final amount after a percentage increase or decrease

4-5	**3.2 Growth and decay**
	        Find an amount after repeated percentage change.
	        Solve growth and decay problems.

4-5	**3.3 Compound measures** Solve problems involving compound measures.

4-5	**3.4 Distance, speed and time**
	        Convert between metric speed measures.
	        Calculate average speed, distance and time.
	        Use formulae to calculate speed and acceleration.

5	**3.5 Direct and inverse proportion**
	        Use ratio and proportion in measures and conversions.
	        Use inverse proportions.