



**Lode Heath School**

**Mathematics Department**

**Year 8 Higher  
Autumn Term**

<b>Assignment Title</b>	<b>Unit 1: Fractions &amp; Powers</b>	<b>Date set</b>	<b>Autumn 1</b>
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<b>Summary of Unit 1</b>	<b>Key Words</b>
Apply the four operations to fractions, use prime numbers, factors, multiples, calculate with roots, and with integer indices. Round numbers and measures to an appropriate degree of accuracy.	Consecutive, divisible, factor, common factor, highest common factor (HCF), lowest common multiple (LCM), integer, multiple, prime, prime factor, square, cube, significant figures, approximate.

<b>Prior Knowledge</b>
<p>1) Factors of      a) 48      b) 22      c) 100      d) 17</p> <p>2) First 4 multiples of    a) 3    b) 9    c) 12    d) 107</p> <p>3) Can you list the first 5 prime numbers?</p>

## LEARNING JOURNEY

	<b>Task Description</b>
	<b>1.1 Prime factor decomposition</b> Write the prime factor decomposition of a number. Use prime factor decomposition to find the HCF or LCM of two numbers.
	<b>1.2 Laws of indices</b> Work out the laws of indices for positive powers. Show that any number to the power of zero is 1. Use the laws of indices for multiplying and dividing.
	<b>1.3 STEM: Powers of 10</b> Use and understand powers of 10. Use the prefixes associated with powers of 10. Understand the effect of multiplying and dividing by any integer power of 10.
	<b>1.4 Calculating and estimating</b> Calculate with powers. Round to a number of significant figures.

<b>Assignment Title</b>	<b>Unit 2: Algebra and working with powers</b>	<b>Date set</b>	<b>Autumn 1</b>
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<b>Summary of Unit 2</b>	<b>Key Words</b>
Expand and factorise expressions. Understand and use the laws of indices when applied to algebra. Simplify algebraic expressions. Solve multi-step equations.	Expression, equation, indices, base, power, expanding factorising, simplifying, substitution, formula.

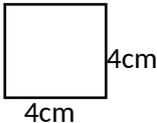
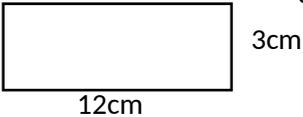
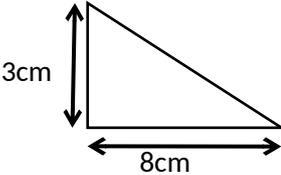
<b>Prior Knowledge</b>		
1. Calculate	a) $3^4 \times 3^2 =$	b) $2^5 \div 2^2 =$ c) $64^{1/2} =$
2. Simplify the expressions:	a) $3x + 4 + 2x + 2$	b) $5x - 1 - 3x + 4$
3. Expand:	a) $3(x + 2)$	b) $4x(x + 1)$
4. Factorise:	a) $5x + 10$	b) $4x + 6$
5. Solve the following equations	a) $x + 3 = 10$	b) $4x = 20$

## LEARNING JOURNEY

	<b>Task Description</b>
	<b>2.1 Simplifying expressions</b> Simplify expressions involving powers and brackets. Understand the meaning of an identity.
	<b>2.2 More simplifying</b> Use the index laws in algebraic calculations and expressions. Simplify expressions with powers.
	<b>2.3 Expanding and simplifying</b> Write and simplify expressions involving brackets and powers. Factorise an algebraic expression.
	<b>2.4 Substituting and solving</b> Substitute integers into expressions. Construct and solve equations.

Assignment Title	Unit 3: 2D shapes and 3D solids	Date set	Autumn 2
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<b>Summary of Unit 3</b>	<b>Key Words</b>
Calculate surface area and volume of prisms. Find the area and circumference of circles. Know and use Pythagoras theorem.	Elevations, plan, view, isometric grid, net, surface area, prism, radius, diameter, circumference, Pythagoras theorem, right-angled, $\pi$

<b>Prior Knowledge</b>	
<p>1. Draw a net that when folded will make a cube</p> <p>2. Calculate:</p> <p>a) <math>6^2 \times 4 =</math></p> <p>b) <math>2^2 \times 3 =</math></p> <p>c) <math>\sqrt{81} =</math></p> <p>3. Find the area:</p> <p>a)  4cm</p> <p>b)  12cm 3cm</p> <p>c)  3cm 8cm</p>	

## LEARNING JOURNEY

Task Description
<b>3.1 Plans and elevations</b> Use 2D representations of 3D solids.
<b>3.2 Surface area of prisms</b> Sketch nets of 3D solids. Calculate the surface area of prisms.
<b>3.3 Volume of prisms</b> Calculate the volume of right prisms.
<b>3.4 Circumference of a circle</b> Name the different parts of a circle. Calculate the circumference. Calculate the radius or diameter when you know the circumference.
<b>3.5 Area of a circle</b> Calculate the area of a circle. Calculate the radius or diameter when you know the area.
<b>3.6 Cylinders</b> Calculate the volume and surface area of a cylinder.
<b>3.7 Pythagoras' theorem</b> Use Pythagoras' theorem in right-angled triangles.

Assignment Title	Unit 4: Real life graphs	Date set	Autumn 2
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Summary of Unit 4	Key Words
<p>To know what a proportional relationship look like on a graph.</p> <p>Understand finance graphs</p> <p>Interpret rates of change.</p> <p>Show journeys on a distance-time graph.</p>	<p>Proportions, speed, acceleration, relationship, distance, time, interpret, evaluate, rate of change, bias, misleading.</p>

Prior Knowledge
<p>1. If 1 yard <math>\approx</math> 0.9 metres, find</p> <p>a) 4 yards = ____m</p> <p>b) ____ yards = 8.1 metres</p> <p>c) 300 yards = ____m</p>

## LEARNING JOURNEY

Task Description
<p><b>4.1 Direct proportion</b></p> <p>Recognise when values are in direct proportion.</p> <p>Plot graphs and read values to solve problems.</p>
<p><b>4.2 FINANCE: Interpreting financial graphs</b></p> <p>Interpret graphs from different sources.</p> <p>Understand financial graphs.</p>
<p><b>4.3 Distance-time graphs</b></p> <p>Draw and interpret distance-time graphs.</p> <p>Use distance-time graphs to solve problems.</p>
<p><b>4.4 Rates of change</b></p> <p>Interpret graphs that are curved.</p> <p>Interpret real-life graphs.</p>
<p><b>4.5 Misleading graphs (GCSE Statistics)</b></p> <p>Understand when graphs are misleading.</p>