# Lode Heath School

## Mathematics Department

## Year 9 Higher
## Autumn Term

| Assignment Title | Unit 1: Number | Date set | Autumn 1 |
|---|---|---|---|

| Summary of Unit 1 | Key Words |
|---|---|
| Using place value and reasoning to solve problems. Use estimation in calculations. Calculate HCF and LCM. Use surds and index form. | Estimate, powers, place value, HCF, LCM, indices, standard form, surds. |

**Prior Knowledge**

1. Round to the nearest 10:

   25 77 92 1054

2. Find the factors of 24

3. List the square numbers up to 100

4. List the prime number up to 30

# LEARNING JOURNEY

| Level | Task Description |
|---|---|
| 4 | **1.1 Number problems and reasoning**<br>Work out the total number of ways of performing a series of tasks. |
| 4 – 5 | **1.2 Place value and estimating**<br>Estimate an answer.<br>Use place value to answer questions. |
| 4 – 5 | **1.3 HCF and LCM**<br>Write a number of the product of its prime factors.<br>Find the HCF and LCM of two numbers. |
| 4 - 5 | **1.4 Calculating with powers (indices)**<br>Use powers and roots in calculations.<br>Multiply and divide using index laws.<br>Work out a power raised to a power. |
| 5 - 6 | **1.5 Zero, negative and fractional indices**<br>Use negative indices.<br>Use fractional indices. |
| 4-6 | **1.6 Powers of 10 and standard form**<br>Write a number in standard form.<br>Calculate with numbers in standard form. |
| 7-8 | **1.7 Surds**<br>Understand the difference between rational and irrational numbers.<br>Simplify a surd.<br>Rationalise a denominator. |

| Assignment Title | Unit 2: Algebra Expressions and formulae | Date set | Autumn 2 |
|---|---|---|---|

| Summary of Unit 2 | Key Words |
|---|---|
| Understanding and writing algebraic expressions, simplifying and substituting into expressions.<br>Expanding brackets and factorising.<br>Rearranging formulae.<br>Solving problems with linear and non-linear sequences | Indices, equations, term, standard form, sequence, expand, factorise. |

**Check in: What do you know already?**

1) If x = 4, what is the value of: a) 3x – 10 b) $x^2$ – 6 c) 7 – 3x

2) Expand 2( 2x +4)

3) If your age is now "N" years write an expression for your age when you are 2 years less than double you current age.

# LEARNING JOURNEY

| Level | Task Description |
|---|---|
| 4-5 | **2.1 Algebraic indices**<br>Use the rules of indices to simplify algebraic expressions. |
| 4-5 | **2.2 Expanding and factorising**<br>Expand brackets.<br>Factorise algebraic expressions. |
| 4-6 | **2.3 Equations**<br>Solve equations involving brackets and numerical fractions.<br>Use equations to solve problems. |
| 4-6 | **2.4 Formulae** *(GCSE Statistics)*<br>Substitute numbers into formulae.<br>Rearrange formulae.<br>Distinguish between expressions, equations, formulae and identities. |
| 4 | **2.5 Linear sequences**<br>Find a general formula for the nth term of an arithmetic sequence.<br>Determine whether a particular number is a term of a given arithmetic sequence. |
| 4-7 | **2.6 Non-linear sequences**<br>Solve problems using geometric sequences.<br>Work out terms in Fibonnaci-like sequences.<br>Find the nth term of a quadratic sequence. |
| 5-6 | **2.7 More expanding and factorising**<br>Expand the product of two brackets.<br>Use the difference of two squares.<br>Factorise quadratics of the form $x^2 + bx + c$. |