The High School Leckhampton

Year 7 **MATHS**

Intent

The intention of the maths curriculum is to foster pupils' interest, enjoyment, and curiosity of maths. By following the National Curriculum, our curriculum will be rigorous, coherent and connected throughout Key Stage 3. We aim to develop competent mathematicians who are able to apply their knowledge across subjects, year on year.

By designing the curriculum around a mastery approach all students will gain depth to their learning leading to secure and sustained progress over time All students will develop their fluency, reasoning and problem-solving skills.

The department has the strong belief that all students can be successful in maths and teaching for understanding is at the heart of every lesson

Topic Titles

- Toolkit lessons
- Properties of number
- Comparing numbers
- Multiplying and dividing decimals
- Constructions and labelling
- 2D shapes
- Proportional reasoning
- 3D shapes
- Expressions
- Units
- Area and volume
- Calculations with fractions
- Transformations
- Measuring and presenting data

How will knowledge and skills be taught?

Knowledge and skills will be taught through a combination of teacher-student explanation and student self-discovery. Teaching will follow the NCETMs Teaching for Mastery approach with lessons consisting of visual representations, modelling and purposeful practice to help students build and link their knowledge together.
There is a focus in year 7 of building a secure foundation. Students will revisit ideas they have met in primary school before building on these in further depth.
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Links with other subjects

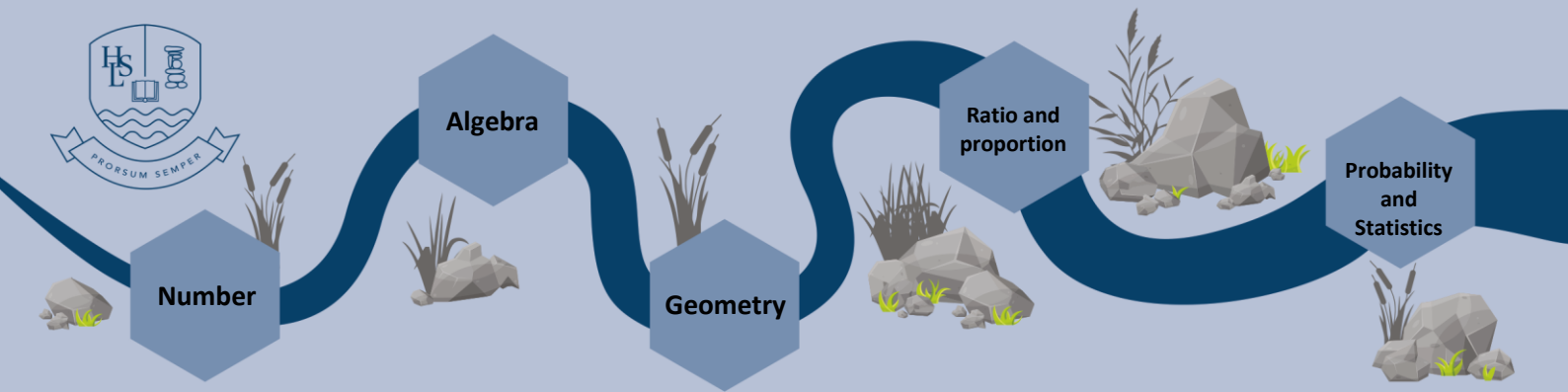
- Averages and data – Science
- Geometric reasoning – Art
- Fractions – Music
- Logical reasoning – computing
- Measures - Tech
- Percentages and negative numbers – History
- Graph interpretation and measures - Geography

Recommended Reading and Preparation for Learning

Murderous Maths – Kjartan Poskitt
The Number Devil – Hans Magnus Enzensberger
The Man Who Counted – Malba Tahan
Alex's Adventures in Numberland – Alex Bellos
How Long is a Piece of String – Rob Eastaway
How Many Socks Make a Pair – Rob Eastaway
Humble Pi – Matt Parker

How can parents help?

- Present a positive opinion of maths – please change: 'I was never very good at maths' to ' I had to work really hard at maths'
- Encourage your child to attend Sum Up The Week to consolidate their learning
- Highlight the use of maths in your everyday life – calculating change, timings etc
- Speak to your child about the maths they are learning in school and ask them to explain their understanding to you.
- Maintain your child's fluency with times tables, mental maths and written multiplication and division.



Subject: Maths	Year Group: 7	Term: 1, 2 and 3

Module/Theme: Ratio and Proportion

Topic Outline & Aims (Intent)

Students will begin to draw comparisons between two or more measures or objects using the idea of ratio and proportion. They will use the correct notation for ratio and understand what is meant by a ratio. They will simplify ratios and use this to compare them along with dividing a quantity into a given ratio. They will recap and build on their knowledge of percentages and investigate the unitary method further.

Key Skills and Knowledge taught through this topic: (Intent)

- Express a quantity as a fraction and percentage of another
- Describe a comparison or measurements or objects using appropriate ratio notation
- Simplify a ratio by cancelling common factors and using the idea of 1:n and n:1 to compare ratio
- Divide quantities into two parts in a given part:part or part:whole ratio
- Convert fluently between metric units of length, mass, volume, time and money
- Solve problems involving percentage change

Prior Learning: (Context)	**Future Learning:** (Context)	**National Curriculum Links:** (Context)
KS2: Common factors of pairs of numbers Comparison problems Multiplication/division facts up to 12x12 The basic conversions for standard units, time and money Mathematics programme of study: Key Stage 2	KS3: Connecting ratios and fractions (Year 8), Ratio problem solving (Year 8), Plans, scales and enlargements (year 8) Algebraic and graphical direct and inverse proportion (year 9) KS4: As above and Mathematics Programme of Study: Key Stage 4	Mathematics Programme of Study: Key Stage 3

RRSA Links:

Article 17 – Access information
Article 28 – Access education
Article 29 – Goals of education

British Values Links:

Mutual respect – Working together with tolerance and mutual understanding, treating others with respect.

Eco Schools Links:

N/A

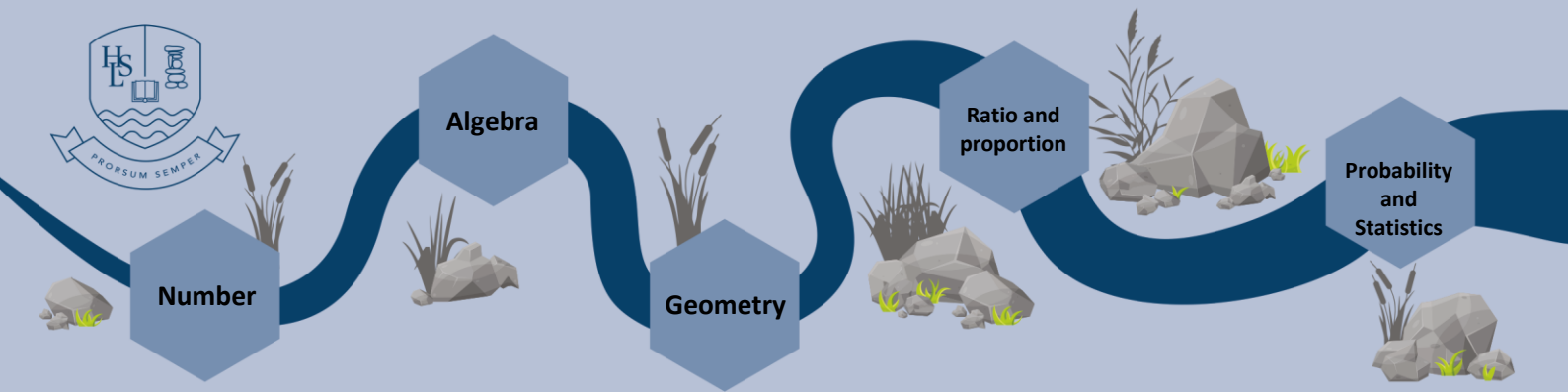
Assessment of Learning: (Impact)

Summative: formal assessments in October, February and June

Formative: BAM tasks and homework tasks

Informal: low-stakes quizzes, questioning, mini-whiteboard work

Reading / Enrichment:	**Key Vocabulary:** (Literacy)	**Numeracy Opportunities:**	**Career Links:**
<u>Useful websites:</u> Mathswatch clips – A1a – A28 Corbettmaths.com <u>In school enrichment:</u> Sum up the week Maths challenge club Weekly maths challenge Numeracy in tutor <u>Books:</u> CGP: Key stage 3 complete practice	Common metric and imperial units, multiplier		Basic numeracy requirement for all careers. Engineer Builder Banker



Subject: Maths	Year Group: 7	Term: 1, 2 and 3

Module/Theme: Algebra

Topic Outline & Aims (Intent)
Through the algebra topics covered in Year 7 students will take the necessary steps for students to progress through working in the concrete and pictorial to the more abstract. Algebra will allow students to generalise the structure of arithmetic and formulate mathematical relationships. Focusing predominantly on expressions in year 7 will enable students to become fluent in algebraic notation and manipulation.

Key Skills and Knowledge taught through this topic: (Intent)

- Use and interpret algebraic notation including brackets
- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
- Simplify and manipulate expressions by collecting like terms and expanding brackets
- Substitute numerical values into expressions and formulae
- Solve linear equations involving brackets
- Work with coordinates in all 4 quadrants
- Link the algebraic and graphical representations of vertical, horizontal and diagonal lines.
- Generate terms of a sequence from the term-to-term rule and recognise arithmetic sequences

Prior Learning: (Context)
KS2:
Use of symbols and letter to represent missing numbers
Substitute into worded formulae
Substitute into simple formulae

Mathematics programme of study: Key Stage 2 Pg 42-43

Future Learning: (Context)
KS3: Solving more complicated linear equations/inequalities
Factorising linear expressions/equations
Manipulating quadratic expressions/equations
Rearranging expressions/equations
Working with linear and quadratic graphs and sequences
Simultaneous equations.
KS4: As above and Mathematics Programme of Study: Key Stage 4 Pg7-8

National Curriculum Links:
(Context)
Mathematics Programme of Study: Key Stage 3

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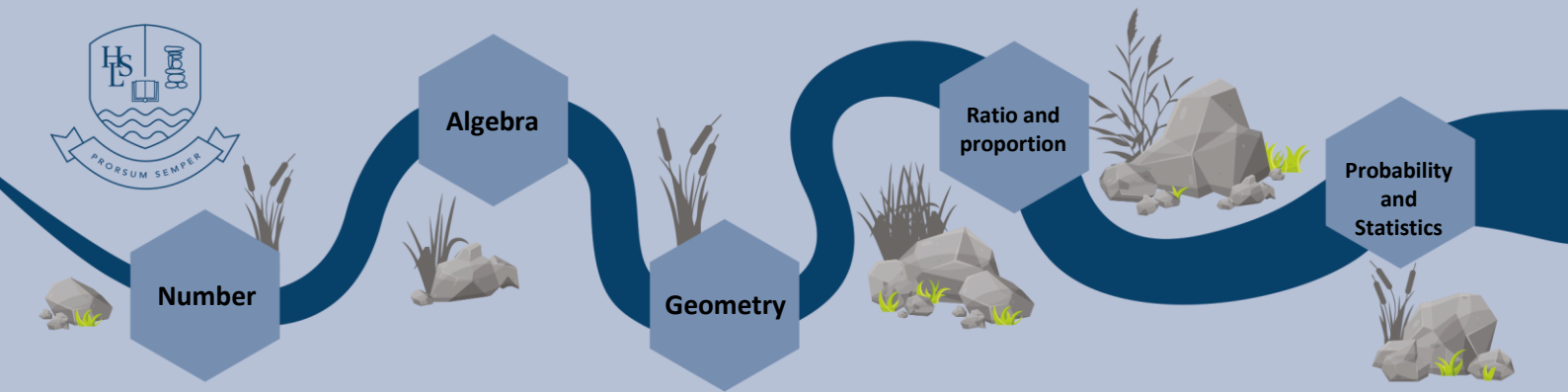
In school enrichment:
Sum up the week
Maths challenge club
Weekly maths challenge
Numeracy in tutor
Books:
CGP: Key stage 3 complete practice

Key Vocabulary: (Literacy)
Expression, equation, formulae, term, function, variable, simplify, expand, substitute, solve,

Numeracy Opportunities:

Career Links:
Engineer
Economist
Accountant
Financial analyst
Data analyst
Research scientist
Computer programmer



Subject: Maths	Year Group: 7	Term: 1, 2 and 3

Module/Theme: Geometry

Topic Outline & Aims (Intent)
During year 7 students will recap and build upon their prior learning in geometry. Focus will be given to the accuracy of both written and oral work. Through discovery students will be able to clarify their understanding of properties of 2D shapes and angle rules they have previously met. They will gain a deeper understanding of the area calculations they have previously met and will apply their understanding of rectangles to calculate the surface area of cuboids. They will meet transformations and apply these to sets of axis building on their work with coordinates.

Key Skills and Knowledge taught through this topic: (Intent)

- Use the standard conventions for labelling the properties of 2D shapes (sides, angles, parallel and perpendicular lines, line and rotational symmetry)
- Accurately draw and measure line segments and angles
- Apply the properties of angles in a straight line, around a point, vertically opposite, within a triangle and within a quadrilateral.
- Understand the perimeter of a 2D shape and compound shapes.
- Calculate the area of triangles, parallelograms and trapezia
- Work with 3D shapes (faces, edges, vertices, volume, surface area and nets)
- Identify, describe and construct reflections, rotations and translations

Prior Learning: (Context)	**Future Learning:** (Context)	**National Curriculum Links:** (Context)
KS2: Use of ruler and protractor Definitions of parallel and perpendicular Basic angle facts (straight line, point, triangles and quadrilaterals) Names of 3D shapes Faces, edges, vertices Reflection and translation Formulas for area of 2D shapes Mathematics programme of study: Key Stage 2 Pg 43 - 45	KS3: Plans and elevations (Year 8) Volume of cylinders (Year 8) Area and perimeter of compound shapes (Year 8) Scale drawing and enlargement (Year 8) Constructions and Loci (Year 9) Bearings (Year 8) Angles in parallel lines and polygons (Year 8) Congruent and similar shapes (Year 9) Surface area of triangular prisms and cylinders (Year 9) KS4: As above and Mathematics Programme of Study: Key Stage 4	Mathematics Programme of Study: Key Stage 3

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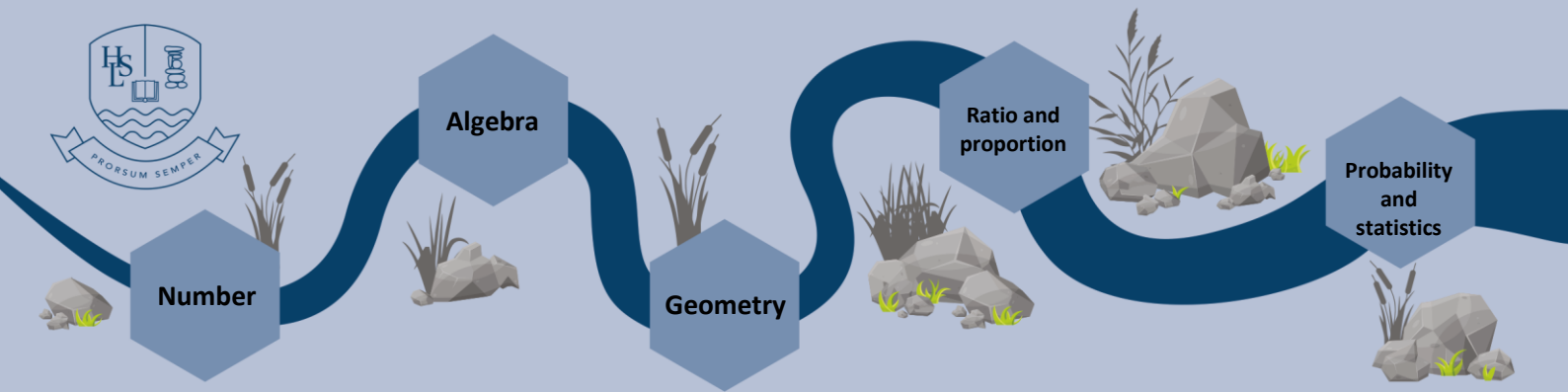

Subject: Maths	Year Group: 7	Term: 1, 2 and 3

Module/Theme: Number

Topic Outline & Aims (Intent)

The Number strand of the curriculum is fundamental to successful progression through Key Stage 3. The aim is for students to become fluent in the fundamentals of number theory. Students will deepen their understanding of familiar numerical concepts from Key Stage 2 including place value, the number system, properties of numbers and calculation.

Key Skills and Knowledge taught through this topic: (Intent)

- Understand and use place value for integers, decimals and measures
- Order and work interchangeably between fractions, decimals and percentages
- Calculate the 4 operations using integers and fractions
- Recognise, calculate and use the properties of natural numbers (prime, factors, multiples, HCF/LCM)
- Use integer powers and roots within the correct order of operations
- Understand and use the unitary method for percentages in a range of problems (percentages of amounts and percentage change)
- Understand how to round numbers to appropriate degrees of accuracy (decimals and significant figures)

Prior Learning: (Context)

KS2:
Mathematics Programme of Study: Key Stage 2 (Page 6, 11, 18, 24, 31, 39)

Future Learning: (Context)

KS3:
Product of prime factors (Y8)
Standard form (Y8 and 9)
Negative numbers (Y8)
Percentage multipliers (Y8)
Error intervals (Y9)
KS4:
Fractional and negative indices
Working with surds and recurring decimals

National Curriculum Links: (Context)

Mathematics Programme of Study: Key Stage 3 (Page 5 and 6)

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Useful websites:
Mathswatch clips – N1 – N46
Corbettmaths.com

In school enrichment:
Sum up the week
Maths challenge club
Weekly maths challenge
Numeracy in tutor

Books:
CGP: Key stage 3 complete practice

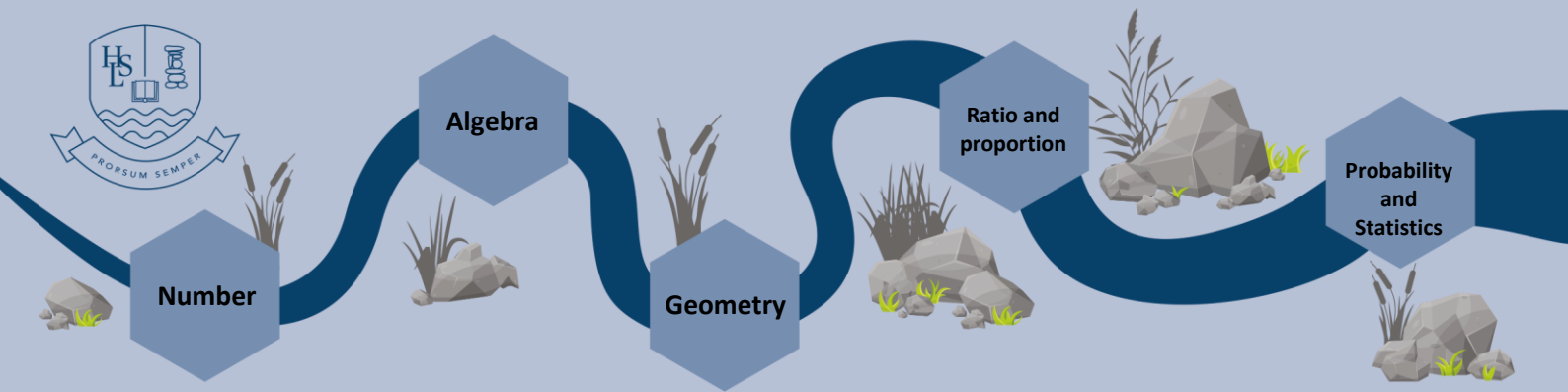
Key Vocabulary: (Literacy)

Place value, square number, cube number, square root, cube root, rounding, significant, estimate, prime, factor, multiple, operation, numerator, denominator, equivalent, simplify, divisor, dividend, quotient, multiplicand

Numeracy Opportunities:

Career Links:

Basic numeracy requirement for all careers



Subject: Maths	Year Group: 7	Term: 1, 2 and 3

Module/Theme: Probability and Statistics

Topic Outline & Aims (Intent)

Students will meet a range of statistical measures and begin to understand how data can be interpreted and justify the most appropriate measure for statistical analysis. They will use this to spot trends and make generalisation. Students will meet and build on the graphs and tables used to present data in Key Stage 2 and develop a greater depth to their understanding and analysis of such graphs.

Key Skills and Knowledge taught through this topic: (Intent)

- Describe interpret and compare measures of central tendency and spread
- Describe interpret and compare graphical representations of discrete data
- Construct and interpret appropriate tables, charts and diagrams including frequency tables, bar charts, vertical line charts, comparative bar charts and pie charts.

Prior Learning: (Context)

KS2:

- Understand the meaning of 'average' as a typicality (or location)
- Construct and interpret a pictogram
- Know how to tally
- Construct and interpret a line graph and single bar charts
- Understand pie charts

Mathematics programme of study: Key Stage 2 Pg

Future Learning: (Context)

KS3:

Y8 - Averages from tables (including grouped tables)
Y8 - Bivariate data (scatter graphs)
Y9 – Time series
Y9 – Frequency polygons
KS4: As above and Mathematics Programme of Study: Key Stage 4

National Curriculum Links: (Context)

Mathematics Programme of Study: Key Stage 3 pg 9

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Numeracy in tutor
Books:
CGP: Key stage 3 complete practice

Key Vocabulary: (Literacy)

Common metric and imperial units, multiplier

Numeracy Opportunities:

Career Links:

Basic numeracy requirement for all
Data analyst
Actuary
Statistician
Business leader