Highshore School

Maths Policy

Rationale

At Highshore, we want all our students to reach their potential later in life, with Mathematical skills being a key part of this. We believe that Mathematical skills need to be cultivated through a carefully sequenced and planned curriculum that employs mastery learning. We want our students to have Mathematical skills to access further studies, employment, activities in daily life and a lifelong enjoyment of Maths.

Aims and Values

Aims and values	Maths Focus
Independence	Mathematical skills are important for helping students to achieve independence in life, such as financial and time management.
Self-help	Mathematical skills also give students the tools to support themselves in life, for example, problem solving which bus to take or how to manage a budget.
Communication	Use of positional and measurement-based language helps support student communication, such as following or giving directions, looking or searching for items e.g, my keys are under my coat.
Kind	Stories help develop students' understanding of what it means to be kind, fair and equal. Mathematical skills enable students to be kind through understanding how to share and be kind. Concepts such as equal are embedded throughout Maths and develops students understanding of all our values.
Fair	
Equal	
Treat others how we want to be treated	

Roles and Responsibilities

Who?	Responsibility
Senior Leadership Team	To support the Maths lead in fulfilling their role as part of the whole school curriculum, ensuring pupil progress remains high and consistent.
Middle Leaders (Maths Lead)	To monitor the progress and teaching of Maths throughout the school.
Teachers	To ensure all students have appropriately challenging Maths outcomes within the Cognition and Learning strand.
Teaching Assistants	To support all students in achieving their Maths outcomes.

Structure/Approach

Maths covers the following strands, as set out in the National Curriculum, which we have adapted for Highshore students.

Maths Number:

- Understanding and recognition of numbers including sequence, value and calculations.

Functional Maths including:

Measures and position:

- Understanding of comparisons, labelling and Mathematical language

Time:

-Knowledge of time, both reading and understanding what time it is, how long before and after or to an event or schedule.

Money:

-Understanding of value and money as part of an exchange.

Problem Solving:

-Knowledge of different problem solving skills and strategies that will support students in navigating day to day life.

Teaching

Despite the wide range of learners, all Maths lessons/activities should include the following non-negotiables:

- - Planning that follows the curriculum map
- - High quality teaching
- - Individualised outcomes with clear next steps
- - Use of support staff
- - Use of Makaton or other strategies to support understanding
- - A high standard of presentation in books
- - A wide range of learning activities that are recorded in student books

  e.g, photos, student individualised work sheets

- - Feedback that moves on student learning

More specifically, the teaching of Maths follows the principles set out in Power Maths and White Rose Maths. Based on these programs, all Maths lessons are taught with Mastery in mind. This means, that students work towards mastery of different skills and outcomes before moving on. This ensures that learning is embedded and not merely a tick a box exercise.

In addition to this, the following subject specific elements should be evident in each lesson:

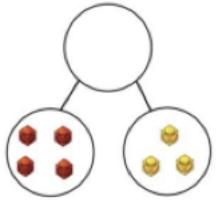
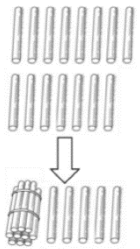
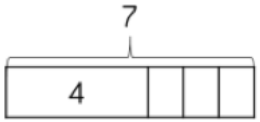
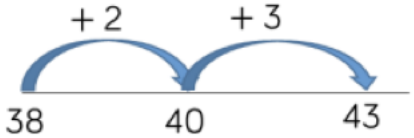
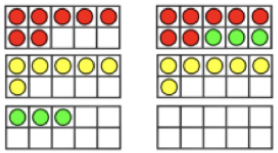
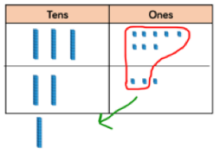
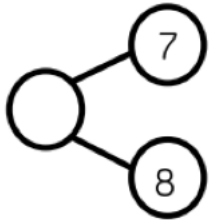
- A Maths starter or 'power up' to begin each lesson.
- Key Mathematica language used throughout the lesson
- Skills broken down and explicitly taught to students

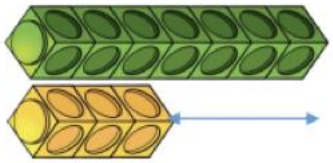
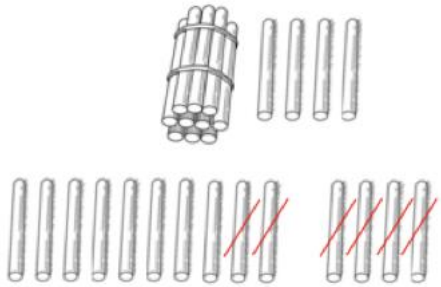
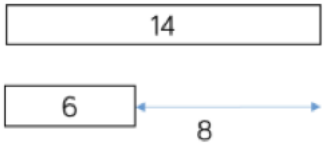
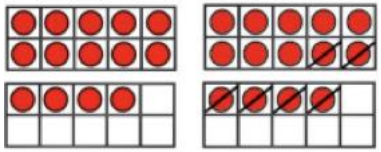
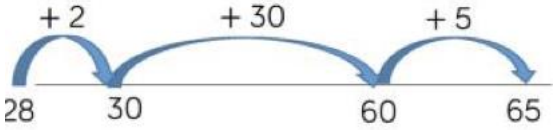
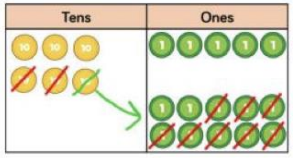
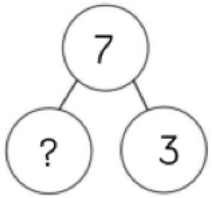
Planning should also reflect a focus on what elements of Maths should be taught. For the Key Stages this is as follows:

- Key Stage 3: Predominantly Number with 1 functional Maths lesson per week
- Key Stage 4: An even split with Number and Functional lessons per week
- Key Stage 5: A single Number lesson with all other lessons focused on functional Maths.

To ensure consistency and continual progression, we have a whole school calculation and problem-solving steps. This is to ensure that students receive the same progression of instruction as they move throughout the school.

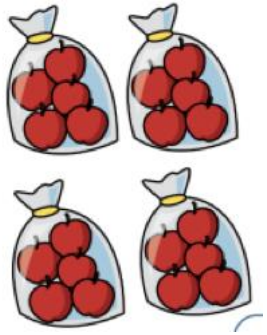
Calculation

Objective	Concrete	Pictorial	Abstract
Addition	Part whole model e.g, using cubes (4 + 3 = 7)  Numicon (4 + 3 = 7)  Dienes (8 + 7 = 15) 	Bar model (4 + 3 = 7)  Number track/line (4 + 3 = 7)   Ten frame (7 + 6 + 3 = 16)  Place value grid (38 + 23 = 61)  	Part- whole written (7 + 8 = 15)  Number sentence (38 + 23 = 61) $38 + 23 = 61$ Column method (1378 + 2148 = 3526) $\begin{array}{r} 1378 \\ +\,2148 \\ \hline 3526 \\ \hline 1\ 1 \end{array}$

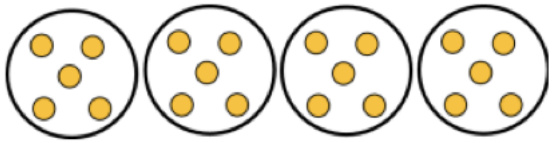
Subtraction	Objects e.g, cubes (7 – 4 = 3)  Numicon (7 – 4 = 3)  Dienes (14 – 6 = 8) 	Bar model (14 – 6 = 8)  Ten frame (14 – 6 = 8)  Number tracks/lines (14 – 8 = 6)  (65 – 28 = 37)  Place value grid (65 – 28 = 37)  	Part whole model (7 – 3 = 4)  Number sentence (65 – 28 = 37) $65 - 28 = 37$ Column method (65 – 28 = 37) $\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 2\ 8 \\ \hline 3\ 7 \end{array}$

<table>
<tr>
<td>Multiplication</td>
<td>Repeated addition using objects e.g numicon or groups of objects

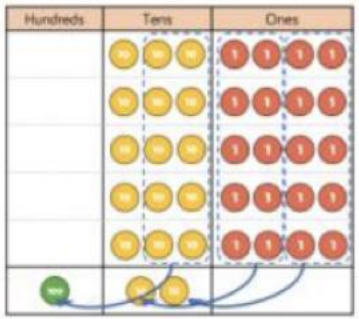
(5 + 5 + 5 + 5 = 20)
(5 x 4 = 20)

  </td>
<td>Grouping totals for repeated addition visually
(5 x 4 = 20)

Place value grid (34 x 5 = 170)

 
</td>
<td>Number sentences

$34 \times 5 = 170$

Column methods (expanded)

<table>
<tr><td></td><td>H</td><td>T</td><td>O</td><td></td><td></td></tr>
<tr><td></td><td></td><td>3</td><td>4</td><td></td><td></td></tr>
<tr><td>×</td><td></td><td></td><td>5</td><td></td><td></td></tr>
<tr><td></td><td></td><td>2</td><td>0</td><td>(5 × 4)</td><td></td></tr>
<tr><td>+</td><td>1</td><td>5</td><td>0</td><td>(5 × 30)</td><td></td></tr>
<tr><td></td><td>1</td><td>7</td><td>0</td><td></td><td></td></tr>
</table>

Column method

<table>
<tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>1</td><td>8</td><td>2</td><td>6</td></tr>
<tr><td>×</td><td></td><td></td><td></td><td>3</td></tr>
<tr><td></td><td>5</td><td>4</td><td>7</td><td>8</td></tr>
</table>
2 1

Multiplication grid

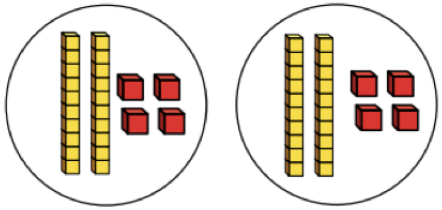
<table>
<tr><td>×</td><td>200</td><td>30</td><td>4</td></tr>
<tr><td>30</td><td>6,000</td><td>900</td><td>120</td></tr>
<tr><td>2</td><td>400</td><td>60</td><td>8</td></tr>
</table>
</td>
</tr>
</table>

Division

Objects (20 ÷ 5 = 4)

Numicon (20 ÷ 5 = 4)

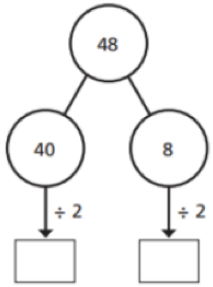
Dienes (48 ÷ 2 = 24)



Place value grid (48 ÷ 2 = 24)

Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1

Part whole (48 ÷ 2 = 24)



Number sentences

$$48 \div 2 = 24$$

Short division (52 ÷ 4 = 13)

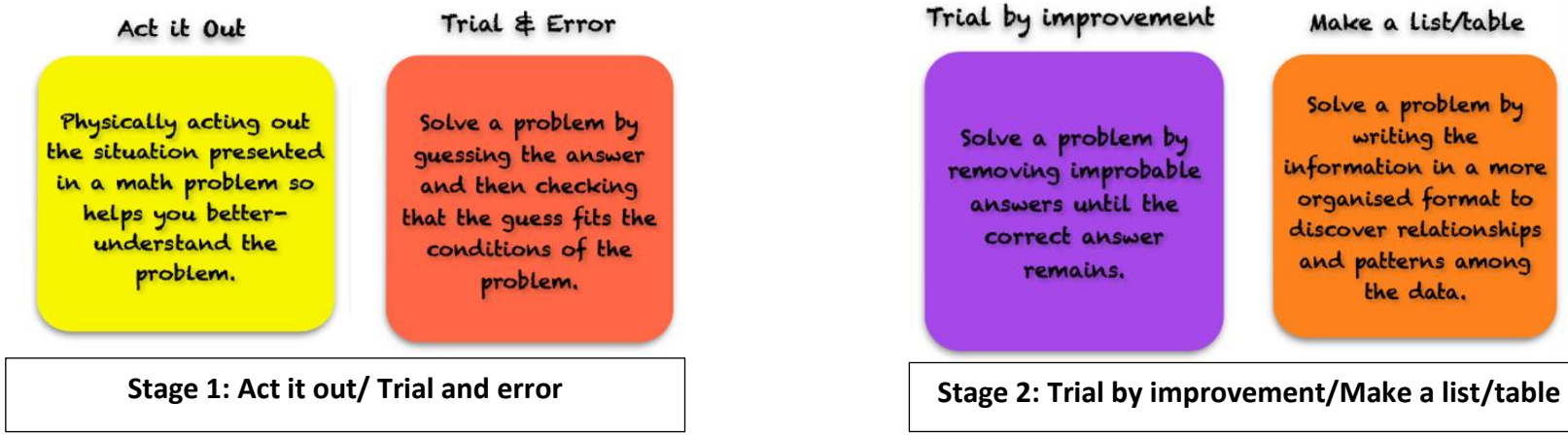
		1	3	
	4	5	12	

Long division (372 ÷ 15 = 24 r 12)

			2	4	r	1	2
1	5	3	7	2			
	–	3	0	0			
			7	2			
	–		6	0			
			1	2			

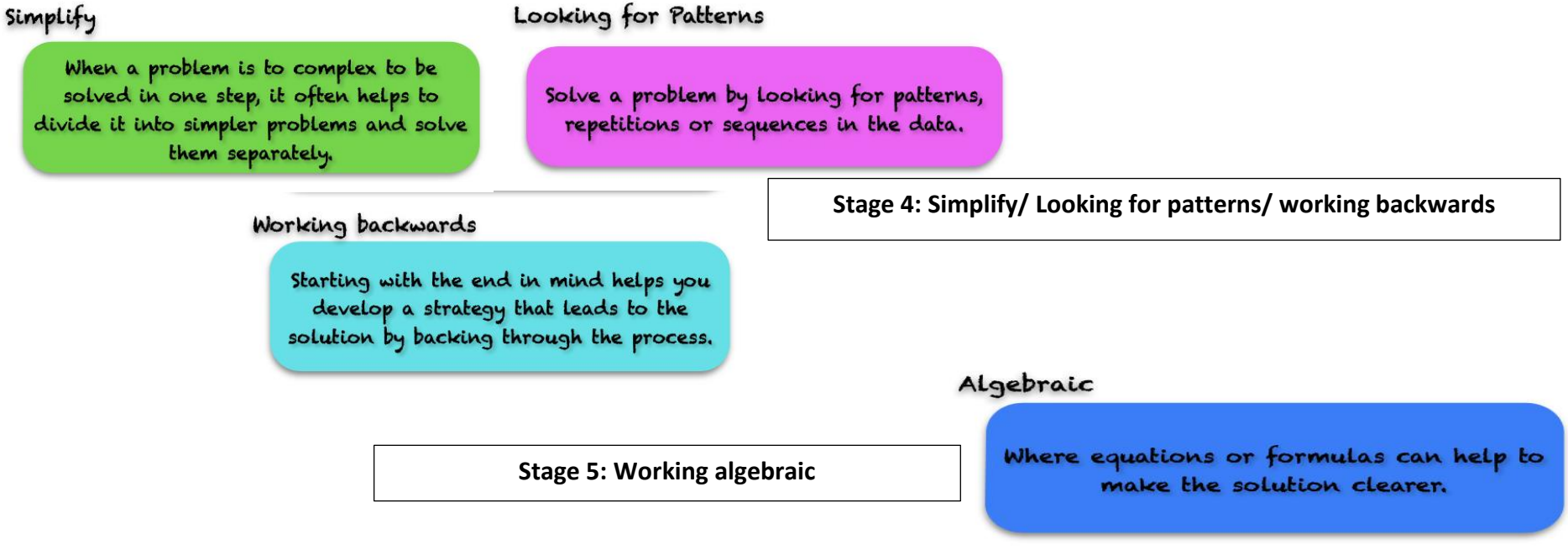
$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

Problem Solving



Stage 1: Act it out/ Trial and error

Stage 2: Trial by improvement/Make a list/table



Stage 4: Simplify/ Looking for patterns/ working backwards

Stage 5: Working algebraic

Problem examples

Strategy	Description
Act it out	Physically acting out the situation presented in a math problem so helps you better understand the problem.
Trial and error	Solve a problem by guessing the answer and then checking that the guess fits the conditions of the problem.
Trial by improvement	Solve a problem by removing improbable answers until the correct answer remains.
Make a list/table	Solve a problem by writing the information in a more organised format to discover relationships and patterns among the data.
Simplify	When a problem is to complex to be solved in one step, it often helps to divide it into simple problems and solve them separately.
Looking for patterns	Solve a problem by looking for patterns, repetitions or sequences in the data.
Moving backwards	Starting with the end in mind helps you develop a strategy that leads to the solution by backing through the process.
Algebraic	Where equations or formulas can help to make the solution clearer.

Below is progression for different problem-solving skills/strategies. In each stage, the strategy that should be taught/known/employed by students as listed. By Stage 5, all students should be adept at using a range of strategies, making informed choices depending on the problem, in which strategy they should use.

	Explanation	**Strategy 1**	**Strategy 2**	**Strategy 3**	**Strategy 4**	**Strategy 5**	**Strategy 6**	**Strategy 7**	**Strategy 8**
Stage 1	Informal strategies. Based on guessing and physically acting out problems.	Act it out	Trial and error						
Stage 2	Move towards written/documenting results. Written recording of steps begins.	Act it out	Trial and error	Trial by improvement	Make a list/table				
Stage 3	Recording of different results begins with more emphasis on looking for patterns.	Act it out	Trial and error	Trial by improvement	Make a list/table	Looking for patterns			
Stage 4	Problems are simplified and worked backwards to ensure that steps are correct.	Act it out	Trial and error	Trial by improvement	Make a list/table	Looking for patterns	Simplify	Working backwards	
Stage 5	Students employ a range of strategies and begin solving algebraicly.	Act it out	Trial and error	Trial by improvement	Make a list/table	Looking for patterns	Simplify	Working backwards	Working algebraic

Assessment

Maths progress is measured against individualised outcomes, which are based on a range of sources. For example, some students may have outcomes based on the Early Learning Goals or adapted National Curriculum outcomes.

Progress is recorded against these outcomes as follows:

- *Not yet Developed* ***(ND)***

- *Emerging* ***(Em)***

- *Developing* ***(D)***

- *Established* ***(E)***

- *Generalised* ***(G)***

Progress is measured against these outcomes twice a year, with monitoring that takes place throughout by the Maths lead and SLT. Each half term, the Maths lead and SLT will monitor progress against outcomes through a series of structured book looks, observations and student voice.

EHCP

Maths is represented in EHCP outcomes under the Cognition and Learning strand. These are the same as the pupil outcomes which are written termly. Each student should have at least 1 Maths Number outcomes and where appropriate, a Functional Maths outcome.

Staff training

Each term a Maths Meeting is held which incorporates staff training. Staff inset days also have a Maths component.

Policy Review

This Policy will be reviewed every three years by the Maths Coordinator and the Deputy Head. Where appropriate this will include consultation with staff.

Stephanie Cousins, Maths Coordinator

Samuel Croyle, Deputy Headteacher

January 2023