BROOK FIELD PRIMARY SCHOOL

Mathematics Policy Statement

INTENT

At Brook Field, we believe that every child can achieve success in mathematics through high-quality, carefully sequenced teaching that inspires curiosity, confidence and a love of learning. Our mathematics curriculum is ambitious and inclusive for all learners, providing equal opportunities for every child to access, enjoy and achieve in maths, regardless of their starting point.

Our curriculum is designed around small, connected steps that build deep, conceptual understanding before moving on. Lessons follow the Oak National Academy Curriculum Planning which is rooted in the principles of Teaching for Mastery (see Appendix 1) and line with the National Curriculum. At Brook Field the teaching of mathematics is enriched through a range of cross-curricular links to ensure learning is engaging, meaningful and relevant. Manipulatives, visual representations and mathematical talk are integral to lessons, helping children construct understanding and make connections between concrete experiences, language, pictures and symbols.

AIMS

At Brook Field we aim to:

- Encourage and enable children to become fluent in the fundamentals of mathematics through frequent varied practice, developing accuracy and efficiency
- Revisit key facts and methods regularly so knowledge is readily recalled and applied with confidence
- Develop their skills to use mathematical reasoning to explain, justify and generalise their thinking with precision and clarity
- Build children's confidence to solve problems by applying their knowledge a variety of contexts, making connections across concepts and ideas

At Brook Field, we value oracy and metacognition as powerful tools in developing mathematical and independent thinking. Pupils are supported to use precise mathematical language to explore, explain, justify and challenge ideas, which strengthens their mathematical understanding. We foster positive learning behaviours such as perseverance, independence, teamwork and curiosity, creating a classroom culture where mistakes are viewed as opportunities for growth.

Through our multi-sensory and engaging approach, all children leave Brook Field as confident, fluent mathematicians who can apply their deep understanding to solve problems, think critically and appreciate the value of mathematics in everyday life and the wider world.

ENTITLEMENT

The national curriculum for mathematics aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics, recalling and applying knowledge rapidly and accurately
- Reason mathematically, exploring and investigating relationships and generalisations, as well as justifying mathematically using appropriate language
- Can persevere to solve complex problems by applying their mathematics to a variety of contexts, breaking down the problems into a series of simpler steps

Mathematics is set down under the following strands:

- Number – Number and place value
- Number – Addition, subtraction, multiplication and division
- Number – Fractions (including decimals and percentages)

- Ratio and proportion
- Algebra
- Measurement
- Geometry – Properties of shape
- Geometry – Position and direction
- Statistics

Mathematical language and progressive strategies (see separate calculation and fraction policies) are used to ensure continuity, progression and high expectations for attainment in maths.

PLANNING AND ASSESSMENT

Planning Overview

Planning is undertaken in accordance with the relevant year group aims and objectives in the National Curriculum. Teachers follow the Oak National Academy Maths Curriculum planning to ensure appropriate objectives are covered, this supports the appropriate amount of time attributed to the relevant units of work.
Short term planning includes daily lesson plans, where teachers organise activities and identify the strategies and skills that will be taught in order for the children to progress within the lesson. Knowledge is built upon within units of work, where children are expected to draw on previous learning, exploring the 'whys' and 'hows' in maths, as well as using key facts and strategies. Deeper thinking is provided through different Blooms activities and a range of Blooms questioning, enabling children to develop their mathematical reasoning in depth.

Assessment Overview

Assessing pupils' progress and record-keeping informs planning and teachers use an adaptive, teaching approach to respond to individual needs in maths. Assessment is carried out in a variety of ways for a variety of purposes. (Please see Appendix 2 and 3 for further details.)

Short Term Planning

Mathematics will be taught every day. Lessons are carefully structured to manage cognitive load and incorporate modelling, guided practice and opportunities for reasoning and problem solving. Daily lesson plans are created where teachers think about the most effective resources needed to scaffold learning providing appropriate challenge for all and deeper thinking in order for everyone to succeed. Teachers plan reactive to the needs, where tasks and activities are adjusted as a result of the previous days learning and guided groups are created from formative assessments.

Unit Assessments

For the core strands in maths, children complete mini assessments after a unit is taught so that the teacher can evaluate the child's level of understanding in each area of maths, informing future planning and ensuring continued progression. These assessments allow teachers to recognise areas of strength and weakness within the different strands of maths and allow them to plan more effectively as a result of the information gathered.

Pupil Progress Meetings

Children's progress is reviewed and data is inputted onto SONAR at the end of term 2, 4 and 6 based on a judgement against the individual or age-related targets taught. These are then reported to the Head Teacher, and are discussed with the class teacher during pupil progress meetings. Interventions are planned for the following term as a result of these discussions. Books, questioning, observations, discussions, an arithmetic paper and unit assessments should inform the teacher of their judgements made at the end of term 2. Arithmetic and reasoning papers should be completed by the children during term 4 and term 6 prior to progress meetings to further support their judgements.

IMPLEMENTATION

Units of Work

The order of units is clearly mapped out by the Oak National Academy with opportunities for regular review and for the children to make connections within their learning. The 'threaded' design enables children to revisit and deepen understanding in key domains such as number (place value, calculation, fractions), geometry and measure and

statistics. While we follow Oak's recommended sequence of units, we retain flexibility to adapt the order to fit our long-term plans, term structure and needs of our children.

Practical and Visual Activities
We believe in teaching using a Concrete, Pictorial and Abstract approach to deepen and secure children's understanding. When learning a new concept or procedure, exploring with a range of manipulatives is encouraged for all learners to bring the concept of maths to life. Visual representations, are used to further support the children with their thinking and this 'seeing it' stage allows children to make connections between the two. Concrete and pictorial representations provide invaluable connections to help all children make sense of number and mathematical symbols as they move on to the abstract stage.

Reasoning Skills
We not only encourage children to calculate accurately in maths, but we also encourage children to explain, justify and explain their thinking. Lessons include a strong emphasis on oracy and include questioning and opportunities to compare methods, helping children develop their skills of reasoning, making connections, identifying relationships and apply their understanding in different contexts. We embrace mistakes by sharing and learning from misconceptions, which helps children to persevere, feel challenged and ultimately succeed.

Problem Solving
The ability to use maths in real-life situations and developing transferrable skills is very important and whenever possible, children should be involved in developing their mathematical skills in context and become aware of the uses of maths in the wider world through using the home, school grounds, topics and the community as a resource. All children are motivated to deepen their understanding by problem-solving at an appropriate level and are encouraged to work systematically and logically. This can involve children working out straightforward, one-step problems or solving more complex, investigative-style problems. Across the school, we provide safe, stimulating classroom environments, where all children feel they can achieve and succeed.

RESOURCES

Within our school, resources and equipment are continually being developed and extended. We have a general maths area containing a range of shared resources and each classroom (and in some cases year groups) has an allocation of maths resources. These classroom resources are clearly labelled and easily accessible for the children, encouraging them to become independent in their learning by allowing them to select the correct tool for the problem in hand.

Our ICT resources include a range of software available for use on the interactive whiteboard which are fantastic, engaging teaching tool. Children are also provided with personal logins to Purple Mash and Times Table Rock Stars where they can play games and complete activities linked to all aspects of the curriculum within maths sessions, as part of their homework or as extra out-of-school activities.

RECORDING OF WORK

The use of practical resources, visual images and models will play a vital role in the early stages of a unit of work when a child is learning a new strategy, with the recording of informal pencil and paper procedures to a more formal approach of recording being adopted as each child progresses. Photographs of the children using manipulatives will be included in books when appropriate (Please see Appendix 4 and 5 for further details of the expectations of how children should present their work.)

CROSS-CURRICULAR LEARNING

Mathematics is used, applied and developed through activities in other areas of the curriculum where appropriate, especially in science and geography.

MARKING

The Marking Policy of the school aims to give children positive feedback in order to develop confidence and a provide children with a feeling of success in maths. Marking is carried out in purple pen and dots are used alongside

incorrect answers. Modelling or circling parts of the question may be used to show a child where they have gone wrong. When appropriate, children are set response tasks to correct their workings; this should be completed by the child in green pen. Editing in maths is either carried out independently or as part of a guided group with a teacher or TA. If a child has had verbal feedback or support, this is indicated in their book. (Please see the Marking policy and Appendix 2 for further details.)

CHALLENGE FOR ALL

High, achievable expectations are set using a 'Teach from the Top' approach, where scaffolding learning enables all children to flourish.
Scaffolding within a lesson might be:

- defining new vocabulary or rephrasing questions
- deploying adult support or encouraging paired work when solving word problems if children struggle with literacy skills
- spending longer during the concrete phase
- using familiar representations or resources
- extra intervention to plug gaps in rapid recall facts
- small steps of learning or short bursts of activities for those children who struggle with attention
- asking for just one solution when presenting children with open-ended tasks

GREATER DEPTH IN MATHS

Children showing a particular aptitude for mathematics, exceeding normal expectations for their year group, will be identified and challenged within the daily maths sessions and their progress monitored. Teachers will stretch these learners and develop their mathematical thinking through deeper thinking and Blooms activities which require children to analyse, evaluate or create; exploring varied representations; cutaways; collaborative tasks; and solving more open-ended style investigations. Teachers identify children as being Greater Depth in maths by using the NACE Maths Identification Criteria.

SPECIAL EDUCATIONAL NEEDS

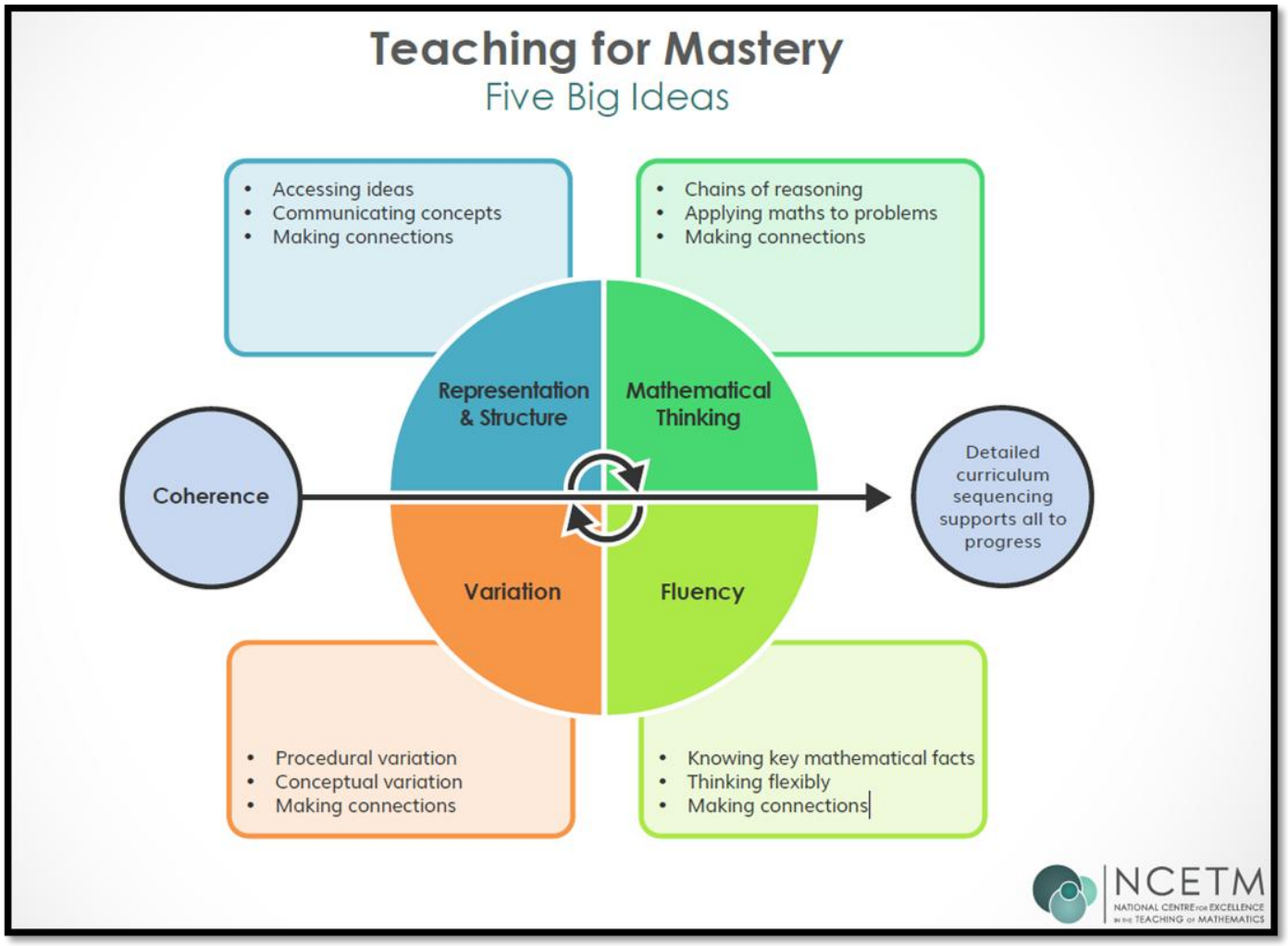
Children working below their age-related expectation for mathematics and individuals with PCPS will be identified and supported in a variety of ways. Some pupils will spend longer using practical resources or pictorial images before moving on to more formal, abstract methods. Others will be targeted with extra TA support and some children will be identified for interventions or as a target group within the mathematics lesson.

METACOGNITION

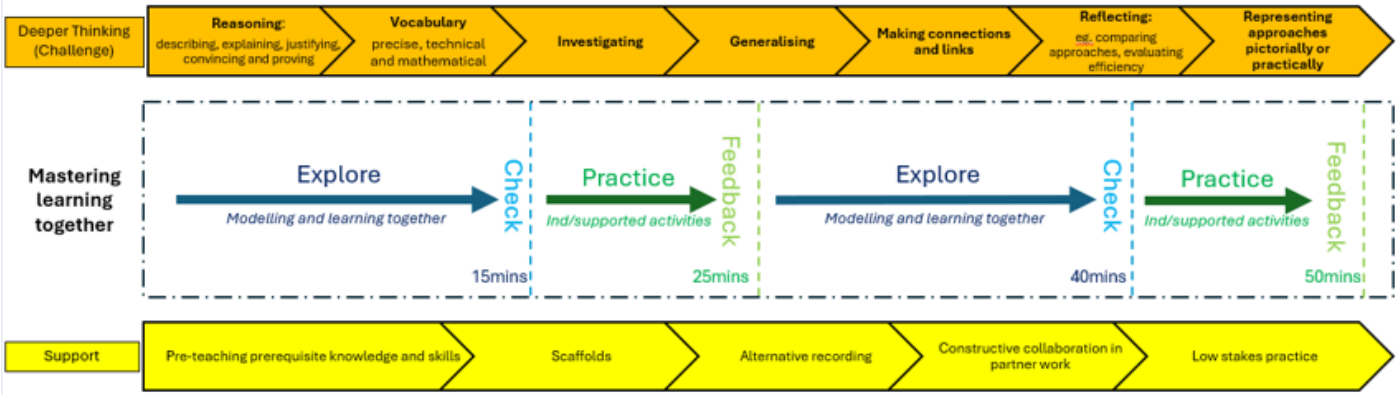
When approaching different tasks, teachers model their thinking and processes which support children in developing their own learning behaviours. This involves planning how to tackle a task; monitoring progress and adapting strategies where necessary; and evaluating overall success. Within maths lessons, children have an increased opportunity to explore, collaborate and discuss their own strategies throughout the lesson. (Please see Appendix 6 for further details.)

Appendix 1

Principles of Teaching for Mastery



Lesson Structure



Appendix 2

Maths Expectations

Planning

- Ensure the Oak Academy Maths Planning and sequence of units is followed over the course of the year and objectives are taken from this to form unit plans. There is flexibility for teachers to move/spend longer on strands depending on their cohort.
- WALTs or questions on the lessons should match the objectives from the Oak Planning resources.
- Deeper Thinking and Blooms questioning/activities should be planned for to allow children opportunities to demonstrate a good depth of understanding.
- Initials of children for T/TA support should be identified on the plan and guided groups should be formed in response to marking where necessary.
- The planning should reflect the models and strategies in the calculation progressions.
- Objectives should be taught in a Concrete, Pictorial and Abstract way in every year group.
- Reasoning questions should be built in to every lesson to help deepen children's understanding.
- Problem-solving activities should be incorporated into all units of work.

Marking

- Marking should be positive and in purple pen.
- 'R' tasks should be set when appropriate e.g. to check questions again.
- Time should be built in to lessons for children to respond to 'R' tasks. If children have minor corrections, it should be assumed that the children can do this independently. Or if children have not grasped the task, guided groups should be taken by the T/TA to consolidate learning, ideally that afternoon or following morning.
- Response to marking should be carried out in green pen.
- 'S' should be written next to a piece of work if the child has had support or 'VF' for verbal feedback.
- Modelling should be used when appropriate, especially to help show organisation of calculations or correct number formation.

Presentation

- The short date should be written and underlined with a ruler by the child at the beginning of every piece of work (KS2).
- Children should traffic light their work every day to self-assess, colouring one square only.
- KS2 children should award up to five effort stars at the end of their work, drawing one star in each square.
- Digits should be written in separate squares should be lined up carefully in the correct Place Value columns. Fractions should be written so the numerator and denominator are in a separate square.

$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

Fluency Skills

- Quick maths, minute maths or times table practise should be carried out by Years 1-6 regularly aside from the maths session.
- Children should complete the 99 club regularly and names should be sent to Mrs Taylor if children have achieved a badge.
- Homework and battles should be set on Times Table Rock Stars in KS2 when appropriate.

Assessment

- Teachers should unit assessments using an appropriate collection of the Oak Academy Lesson Exit Tickets which the children complete after the objectives have been taught. The same assessment should be used for both classes.

- During data entry week in terms 2, 4 and 6 teachers will use the Blue Kite Academy Summative Assessment papers and test analysis should be completed by the children prior to progress meetings.
- Use the Blue Kite Summative Assessment Mark Scheme to ensure accurate, consistent and fair marking. Also use the Blue Kite Question-Level Analysis Spreadsheet (Years 2 – 6) to help identify common areas requiring consolidation.
- Evidence used to support the assessment of a child should be made up from work in books, observations, discussions, questioning, unit assessments and test papers.
- Cross moderation between year groups should be carried out during PPA at regular intervals throughout the year and prior to data entry week to ensure consistency between maths classes.

Appendix 3

Assessment Timetable

Maths Assessment Timetable				
Year group	**Type of Assessment**	**End of Term 2**	**End of Term 4**	**End of Term 6**
Year 1	***End of Unit assessments***	1. Unit 1, 2, 3, 4 2. Unit 5	1. Unit 7 2. Unit 8 3. Unit 9 & 10	1. Unit 12 &13 2. Unit 14, 15, 16 3. Unit 17
	Tests	End of Term 2 BKAT Assessment	End of Term 4 BKAT Assessment	End of Term 6 BKAT Assessment
Year 2 ***Testing of times tables is ongoing***	***End of Unit assessments***	1. Unit 1, 2, 3 2. Unit 4 3. Unit 5	1. Unit 7, 8, 9, 10 2. Unit 11	1. Unit 13 2. Unit 14 3. Unit 15 4. Unit 16 5. Unit 17 6. Unit 18
	Tests	End of Term 2 BKAT Assessment	Past SAT papers for arithmetic and reasoning	Current SAT papers for arithmetic and reasoning Times table check: 2, 5, 10s
Year 3 ***Testing of times tables is ongoing***	***End of Unit assessments***	1. Unit 1	1. Unit 7 2. Unit 8 & 9 3. Unit 10 4. Unit 11	1. Unit 13, 14, 15, 16 2. Unit 17, 18 3. Unit 19
	Tests	End of Term 2 BKAT Assessment 3/6x table assessment	End of Term 4 BKAT Assessment 4/8x table assessment	End of Term 6 BKAT Assessment 9x table assessment
Year 4 ***Testing of times tables is ongoing***	***End of Unit assessments***	1. Unit 1 & 2 2. Unit 3, 4, 5	1. Unit 9 & 10 2. Unit 11 3. Unit 12, 13, 14 4. Unit 15	1. 18, 19, 20, 21 2. Unit 22 3. Unit 23 4. Unit 24
	Tests	End of Term 2 BKAT Assessment 3/4/6/8/9x table assessment	End of Term 4 BKAT Assessment 7, 11, 12x table assessment	End of Term 6 BKAT Assessment MTC
Year 5 ***Testing of times tables is ongoing***	***End of Unit assessments***	1. Unit 1, 2, 3, 4 2. Unit 5	1. Unit 9, 10, 11 2. Unit 12	1. Unit 17, 19, 19, 20 2. Unit 21
	Tests	End of Term 2 BKAT Assessment 3/6/9/12x table assessment	End of Term 4 BKAT Assessment 4/7/8/11x table assessment	End of Term 6 BKAT Assessment 99 Club/Golden 100
Year 6 ***Testing of times tables is ongoing***	***End of Unit assessments***	• Place value • Add and subtraction • Multiplication & division	• Measurement • Fractions	• No unit assessments due to SAT preparation and revision
	Tests	Past SAT papers for arithmetic and reasoning 99 Club/Golden 100	Past SAT papers for arithmetic and reasoning	KS2 SAT papers for arithmetic and reasoning

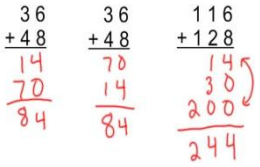
Appendix 4

KS1 Maths Expectations for Children

Celebrating all our steps to success…

To help me do my very best with my maths I will…

- Make sure each number is correctly formed
- Line up my digits carefully in the correct place value column when using written methods
- Traffic light at the end of a piece of work to self-assess how well I understood what I have done



Some symbols or models that may be used in my book…

- . check this answer again
- S – I was helped with this (TA or T)
- modelling of how to do a question/address a misconception
- R – respond to all marking that has a capital R next to it **(in green pen)**

My multiplication grid to help me with my times tables…

12 X 12 Multiplication Table

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Appendix 5

KS2 Maths Expectations for Children

Celebrating all our steps to success…

To help me do my very best with my maths I will…

- Make sure I write each digit of my numbers in a separate square
- Line up my digits carefully in the correct place value column when using written methods
- Use commas when writing large numbers to help make reading them a little easier e.g. **12,345**
- Traffic light at the end of a piece of work to self-assess how well I understood what I have done
- Effort star at the end of a piece of work to self-assess how much effort I have put into my work

Some symbols or models that may be used in my book…

- **.** check this answer again
- √√ - fantastic work
- **S** – I was helped with this (TA or T)
- **modelling of how to do a question/address a misconception**
- **R** – respond to all marking that has a capital R next to it **(in green pen)**

My multiplication grid to help me with my times tables…

12 X 12 Multiplication Table

X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Appendix 6

Metacognitive Regulation in Maths

The types of questions will be used within lessons to support children to think about their own learning.

Planning:

Noticing: Have you seen a task like this before? *(Finding more than one solution, working backwards, using the inverse, noticing a mistake, working out something missing, justifying/proving a statement)*
Prior Knowledge: What prior knowledge do you have that might help? *(Number bonds, times table facts, measurement conversions, fraction/decimal/percentage equivalents, 24-hour clock etc.)*
Plan: What is your plan/goal? *(Think about your organisation. Would using a table, writing a list, working systematically help?)*

Resources: What resources will you need? *(Ruler? Protractor? Mirror?)*
Motivation: How will you stay focused and motivated during the task? *(Demonstrate the learning behaviours we hold as a school)*

Monitoring:

Evaluate Success: Is the strategy you have chosen working?
Multi-step: Do you need to use more than one strategy by breaking the problem down further?
Talk Partners: Could you check in with a partner to see how you are getting on?

Evaluating:

Realistic Answer: Does your answer look realistic to the question?
Change: Did you need to adapt your plan/strategy?
Efficiency: Could you have used a more efficient method?
Reflection: What have you learnt today?