THAKEHAM PRIMARY SCHOOL

'Small School, Big Opportunities, Great Achievements'

Maths Policy

Thakeham Primary School

Date approved by Standards, Teaching and Learning Committee: 27.06.19

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Signed

Headteacher: S. Norton

Chair of Standards, Teaching and Learning Committee:

Introduction

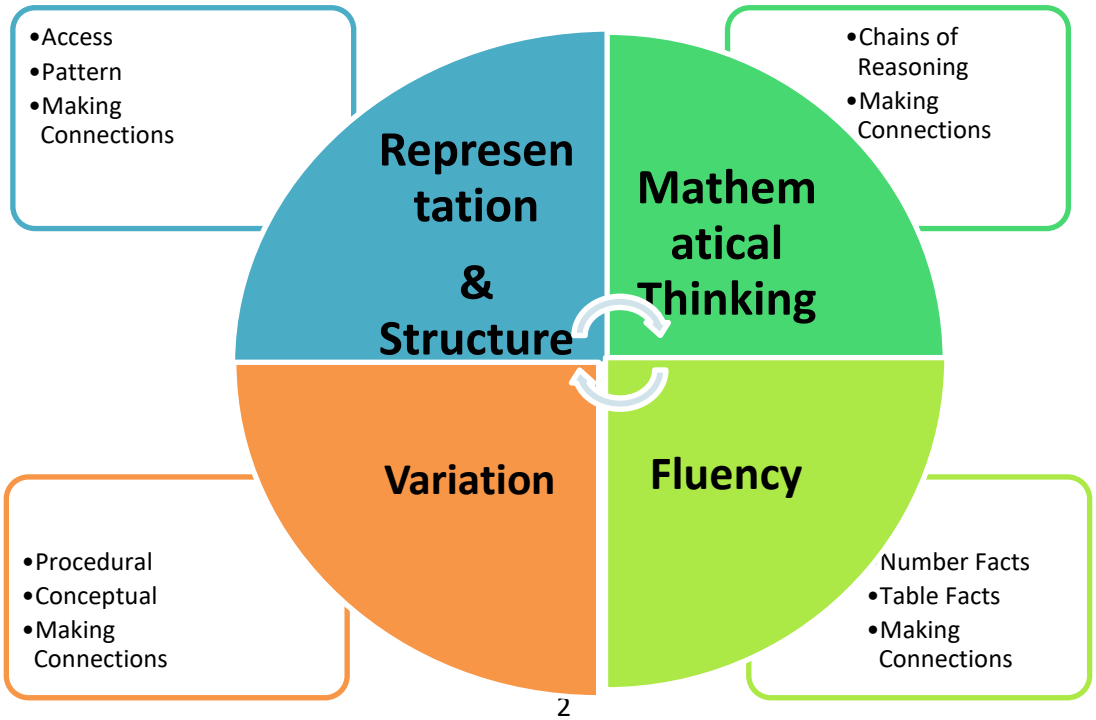
At Thakeham Primary School we value every pupil and the contribution they make. As a result we aim to ensure that every child achieves success and that all are enabled to develop their skills in accordance with their level of ability in accordance with our School Vision:

"High quality learning and teaching are at the heart of our school. We nurture and celebrate each child's individual talents and skills to enable them to be happy, confident and resilient individuals with a passion for learning, inspired to achieve their very best. Through encouraging a strong sense of respect and responsibility, both within our local community and the wider world, we support our children to be co-operative, caring citizens for the future."

Mathematics is both a key skill within school, and a life skill to be utilised throughout every person's day to day experiences.

Mathematics equips pupils with a powerful set of tools to understand the world around them. These tools include fluency, logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is important in everyday life. It is integral to all aspects of life and with this in mind we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them in line with our Curriculum Driver, 'Learning for Life.'

The National Curriculum for Mathematics (2014) describes in detail what pupils must learn in each year group. At Thakeham Primary School we use a Mastery approach to Maths adopted from NCETM (National Centre of Excellence for Teaching Maths). Combined with our STARS Schools calculations policy, this ensures continuity, progression and high expectations for attainment in mathematics.



Aims and Objectives

Children will:

- have a growth mind-set about learning mathematics, with respect for the abilities of others.
- have a positive attitude towards mathematics and an awareness of how fascinating elements of maths can be.
- have fluency and confidence when working with numbers and the number system.
- be problem solvers and link makers, who can reason, think logically, work systematically, identify relationships and make generalisations.
- communicate using mathematical language, and develop the use of mathematics as a means of communicating ideas.
- see the benefit of working both independently and with others.
- develop the ability to apply knowledge, skills and idea in real life contexts outside the classroom, and become aware of the uses of mathematics in the wider world.
- develop personal qualities such as perseverance, independent thinking, cooperation and self-confidence through a sense of achievement and success, in line with our school values..
- understand the importance of mathematics in everyday life.

Teaching and Learning

Pupils are provided with a variety of opportunities to develop and extend their mathematical skills in and across each phase of education. Maths is taught following the National Curriculum 2014, the West Sussex guidelines and appropriate teaching resources within a Mastery approach.

We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education.

'A mathematical concept or skill has been mastered when, through exploration, clarification, practice and application over time, a person can represent it in multiple ways, has the mathematical language to be able to communicate related ideas, and can think mathematically with the concept so that they can independently apply it to a totally new problem in an unfamiliar situation.'

[1] Mastering Mathematics: Teaching to transform achievement, Dr Helen Drury.

The teaching of mathematics at Thakeham Primary School provides opportunities for:

- Group work
- Paired work
- Individual work
- Whole class teaching.

All children (except EYFS) are taught in vertically grouped classes and work is differentiated to suit the needs of the various levels of ability and year groups. The aim of the Mastery approach is for all learners to be successful in mastering the learning appropriate to their

year group. We do place emphasis however on ensuring there are opportunities for challenge within the expectations of their year group. Differentiation we use may be by task, outcome, resources provided or support given.

All children within a maths lesson should understand what they are learning and why (learning objective) and know what they need in order to complete the task (use of the 'Toolkit'). Learning is developed and embedded through use of 'stem sentences' (these express key conceptual ideas or generalities and provide a framework to embed conceptual knowledge and build understanding).

In line with our school value 'curiosity' questioning is a vital part in all our mathematics sessions and questions will be continuously adapted by the teacher and support staff based on assessment for learning.

Within mathematics lessons, through careful planning and preparation, pupils engage in:

- the development of mental strategies
- written methods
- practical activities and mathematical games
- investigational work
- problem solving and reasoning
- mathematical discussion
- consolidation of basic skills and number facts
- Working with computers as a mathematical tool.

At Thakeham Primary School we value and understand the importance of hands-on, practical learning and impact this has on children's engagement and understanding of mathematical concepts. Any activity sheets used should seek to build on and follow on from this and not replace these vital learning opportunities.

At Thakeham, we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We use the appropriate terminology in our teaching and children are also expected to use it in their verbal and written explanations.

To ensure there is adequate time for developing these mathematical skills, each class has a dedicated maths lesson each day. Each lesson is 60 minutes long. Children also have the opportunities to develop and apply these skills across the curriculum.

Children participate in KS1 and KS2 participate in a weekly times tables test in line with our Rainbow Times Tables Awards.

The lesson format we follow includes a mental/oral starter, a main teaching activity and a plenary session.

Planning

We use the National Curriculum 2014 as the basis of our implementation of the programme of study for mathematics. We have adopted the Mixed Year Term by Term Mastery Overviews developed by the White Rose Maths Hub as our long-term overview, which have been designed to support a Mastery approach to teaching and learning and have been

designed to support the aims and objectives of the National Curriculum. 'Maths No Problem' Teacher Text Books' (approved by the DfE) provide further support and resources.

Medium term

Teachers design medium term plans based on the National Curriculum (see appendix 1 for a sample). Our medium term plans are represented in two ways. The 'Learning Journey' provides a cross-curricular or contextual theme for the (half) term's maths and ensures an investigative and real-life approach to engage pupils in line with our Curriculum Drivers 'Learning for Life' and 'Inspired Learners.' The termly overview (for teacher purposes) is taken from White Rose. This outlines the main objectives for the (half) term and defines what we teach. Both plans ensure an appropriate balance and distribution of work across each year. These are adjusted according to the needs of the class.

Short term

Weekly plans list the specific learning objectives for each lesson and give details of how the lessons are to be taught as well as required resources and how adult support is to be deployed (see appendix 2). The planning of small, coherent steps is supported by the following resources, as appropriate:

- White Rose;
- Maths No Problem text books and work books;
- NCETM Spine resources

Progression and continuity
Calculation

In order to ensure consistency across year groups when teaching calculation (addition, subtraction, multiplication and division), teachers and teaching assistants will refer to the STARS/White Rose Calculation Policy for guidance on how to represent a number concept using concrete apparatus, pictorial support or using an abstract form.

See STARS/White Rose Calculation Policy for Concrete, Pictorial, Abstract progression.

Models for supporting problem solving

To support consistency and continuity when solving problems across the school, children will be using a range of models, particularly (though not exclusively): part part whole, bar model and tens frames.

See the STARS/White Rose Calculation Policy for examples of the above representations.

Appropriate links will be made to the models listed above in all year groups, where appropriate, e.g. using a bar model to represent fractions.

Cross Curricular Links

Mathematics is used in other curriculum areas wherever possible or appropriate. Children are expected to demonstrate and apply their skills in mathematics through other areas of the curriculum such as science, geography, art and computing. This helps to expand and

consolidate mathematical concepts and using maths in a purposeful way in real contexts helps the children to realise that mathematics is important in the real world. Wherever possible we utilise cross-curricular links.

For example:

- Draw and interpret graphs in geography
- The study of maps includes the use of coordinates and ideas of direction, position, scale and ratio.
- Roman, Greek or Egyptian activities during topic work
- Construct and interpret charts and tables in science
- The study of patterns in art
- Money management in PHSCE

We endeavour to set work that is challenging, motivating that encourages pupils to talk about what they have been doing.

Inclusion

Through the Mastery Mathematics approach we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's individual needs. Extra support is in place for children with SEN&D, including adult support where necessary. Similarly, the needs of our 'Most Able Pupils' are met through effective in-class differentiation, questioning, and explanations through reasoning. Pupils may also be offered specific enrichment and opportunities in-house and within the STARS locality, including Steyning Grammar School. We make good use of our Disadvantaged (Pupil Premium) funding to support the needs of these children and our Children Looked After (CLA). Details of this and the impact are published on our website.

- All pupils take part in the daily maths lesson.
- Teachers plan lessons so that all pupils can be included and can make progress in the lesson.
- In oral work teachers plan a range of differentiated questions, with some targeted at specific pupils.
- Teachers also ask open questions to allow all children to take part.
- Teachers use a wide range of visual resources to illuminate meaning.
- Appropriate resources such as numicon, dienes, and hundred squares are planned in.
- During whole class teaching and activities, help is given to particular children by teaching assistants where available, the importance of ensuring pupils have opportunities to work and achieve independently is however of great importance, as is access to the teacher.

Children will be identified every term for support or whether they meet our MAP criteria for further enrichment. In addition to support in every day mathematics lessons, children may access pre/post session teaching as means of support. Booster groups may also be used as a means of support to enable them to reach age related expectations.

ILPs are drawn up on a termly basis for children with special educational needs in collaboration with the Inclusion Co-ordinator. Work is differentiated according to individual needs by the class teacher.

All children should have equal access to the curriculum, irrespective of particular circumstances such as race, background, gender and capability.

Resources

Pupils should engage in activities from a variety of sources using a range of equipment. Through regular access to computers and tablets they will experience the fascination of mathematical exploration and investigation. They should also have the power to solve real and challenging problems.

All classes have access to a range of equipment including multilink, Numicon, number lines as well as measuring and weighing equipment. Pupils are encouraged to choose resources which are relevant to their work, take care of and return them.

Pupils begin learning within their lessons using concrete materials and should ideally progress through to pictorial resources before applying their knowledge and understanding to abstract concepts.

Assessment, Recording and Reporting

Assessment

To develop learning, pupils will be continuously assessed using a variety of strategies – observation, questioning, marking in accordance to our school Assessment and Feedback Policy. In EYFS, pupils will be assessed and the Foundation profile completed throughout the year.

The quality of marking is crucial. Teachers use 'PECS' (Prove, Explain, Choose, Solve – see appendix 3) up to 3 times a week, as a strategy which requires children to reflect on their learning. This links to our Super Learning Hero, 'Reflective, Reviewing, Ruby.' All other marking should be linked to the marking codes in our Assessment and Feedback Policy. Information collected through marking about individual successes or misconceptions (formative assessment information) will influence what is taught in following lessons, and may result in planning adaptations.

Progress against the year group objectives is recorded on a target card at the back of the children's maths books and updated half-termly.

All lessons are evaluated and teachers note children not meeting the lesson objectives as well as those exceeding them in order to inform future planning.

Statutory Assessment at Thakeham Primary School

- EYFS: Children are assessed in The early learning goals (ELGs) in the three prime areas of learning (communication and language; physical development; and personal, social and emotional development) and the ELGs in the specific areas of mathematics and literacy

- In year 2 children take end of Key Stage 1 SATs which assess their mathematical skills and knowledge. This involves an arithmetic paper and a second paper that assesses children's ability to apply mathematics to problems and to reason.
- From 2020, year 4 children will undertake a Mathematics Times Tables Check. The purpose of the MTC is to determine whether year 4 pupils can recall their multiplication tables fluently. The children will be tested using an on-screen check answering answer multiplication questions in six seconds. The questions are selected from the 121 number facts that make up the multiplication tables from 2 to 12, with a particular focus on the 6, 7, 8, 9 and 12 times tables as they are considered to be the most challenging.
- In year 6 children take end of Key Stage 2 SATs which assess their mathematical skills and knowledge. This consists of 2 components as in Key Stage 1 (arithmetic and reasoning) but there are 3 papers in total (2 reasoning papers and 1 arithmetic paper).

Recording and reporting

- Each term teachers meet with the Headteacher and the Inclusion Co-ordinator to discuss each child's progress in mathematics to identify whether children are 'on track' to meet their age related expectations and to monitor the rate of progress. For those who are identified as 'not on track' to reach their target, support and intervention are implemented in order for progress to be made towards this.
- Teachers use an electronic tracking system to record children's progress against the National Curriculum objectives for mathematics (SIMS). This reports whether a child is 'Emerging', 'Developing' or 'Secure' with each objective. This can be used to help inform target setting, support and to report final year outcomes. School Analytics is used to calculate individual, cohort and group progress across each term to help identify those who are on track and those who may need further support/enrichment. Outcomes are reported to parents as outlined in our Assessment and Feedback Policy.
- In EYFS, children's attainment against their Early Learning Goals is tracked each term (in months) and progress calculated. Again support is implemented where a need is identified. Outcomes are reported to parents as outlines in our Assessment and Feedback Policy. Children's attainment in each area is recorded as 'Emerging' (1), (Expected' (2) or 'Exceeding' (3). Whether a child has achieved a 'Good Level of Development' is also measured and reported. We use Tapestry is used to as an online learning journal to record, record, track and celebrate children's progress.
- In accordance with statutory requirements an annual report is sent to parents towards the end of the summer term. This report covers progress and achievements in mathematics, setting targets for future improvements and includes the level achieved in the SATs if appropriate.

Moderation

We participate in moderations of our children's work in mathematics throughout the year at a school level and with our locality group of schools. The purpose of moderation is to ensure that an agreement on standards of teacher assessment can be reached. As a result teachers are confident that their assessments are accurate and consistent with the national picture. The discussion focuses on evidence teachers have used to reach their judgment and offers them an opportunity to demonstrate their understanding of standards by focusing on a small number of children and their work. Teachers use exemplification materials

provided by the DfE to help support assessment and moderation. The Local Authority undertakes monitoring and quality assurance for EYFS, Key Stage 1 and 2.

Roles and Responsibilities

Headteacher

- Has overall responsibility for all curriculum areas.
- Provides adequate resources through the school budget.
- Liaises with the Maths Leaders to ensure sufficiently robust strategic plans and CPD opportunities are on place to support effective teaching and leaning
- Oversees and supports the monitoring of Maths provision within the school.

Maths Leaders

- Take the lead in policy development.
- Support colleagues e.g. leading staff CPD, planning support, team teaching.
- Monitor and be accountable for progress in mathematics – this may be done through scrutiny of work, observations and analysis of formal assessment data.
- Liaise with other members of staff to form a coherent and progressive teaching sequence.
- Take responsibility for the choice, purchase and organisation of central resources for Mathematics, in consultation with colleagues.
- Be familiar with current thinking concerning the teaching of mathematics, and to disseminate information to colleagues.
- Report on mathematics to the Headteacher and will liaise with the named link governors.

Teachers

Are responsible for:

- **Lesson planning** as outlined in this policy.
- **Subject knowledge:** teachers are responsible for ensuring their subject-knowledge is up to date and refreshed where necessary. Staff use the NCETM Self-Evaluation Tools and the NCETM National Curriculum Resource Tool in order to improve and refresh subject knowledge. INSET, courses, peer observations, team teaching and visits to other schools form our CPD offer.
- Marking and assessment as outlined in this policy and in our Assessment and Feedback Policy.

Teaching Assistants

Are responsible for:

- **Subject knowledge:** teachers are responsible for ensuring their subject-knowledge is up to date and refreshed where necessary. Staff will be trained in using the NCETM Self-Evaluation Tools and the NCETM National Curriculum Resource Tool in order to improve and refresh subject knowledge. INSET, courses, peer observations, and visits to other schools form our CPD offer.
- reading the weekly plan and ensuring they are fully aware of their role in the lessons.
- supporting with preparation of resources as directed by the classteacher.

Governors

- review the quality of maths teaching and learning across the school.

- review the progress and outcomes of pupils in each cohort as well for groups such as boys/girls/SEND/pupil premium/EAL etc.
- oversee and evaluate the impact of curriculum expenditure on maths, including on staff development and training.

At least 1 governor is linked to Maths and works closely with the Maths Leaders to evaluate the impact of action as set out in the School Strategic Development Plan. They undertake school visits to meet with the Maths Leaders in the Autumn and Spring terms and to see the impact of development work across the school for example seeing teaching in action, staff meetings etc.

Children

Are responsible for:

- committing to a growth mind-set (Positive, Persevering Poppy) about ability in mathematics, with guidance and support from the class teacher.
- sharing their understanding with others in groups or in talk-partners, with guidance and support from the class teacher.
- responding to the teacher's marking (PECS).
- using the 'purple polishing' pens to self/peer-mark (in line with our Assessment and Feedback Policy) and reflect on their understanding, with honesty.

Parents

- are encouraged to support as needed children's Home Learning activities in line with our Home Learning Policy. We draw on a range of different resources, including some online tools such as 'Diagnostic Questions', 'Sumdog' and 'Times Tables Rockstars.
- are encouraged to read and be aware of our Maths Policy and our STARS Calculations Policy.
- are invited to attend workshops and other information sessions, including those linked to statutory testing.
- are given the opportunity to formally discuss their child's progress at two parents' evenings but understand that the schools' 'open door' policy enables them to address concerns throughout the year.

Staff Development

Thakeham Primary School staff have undergone extensive training in this approach through the Mastery programme run by the Sussex Maths Hub and NCETM. Staff knowledge and understanding of this approach will be further developed through the NCETM/Hub's 'Embedding Mastery Programme.'

Teachers are expected to keep up to date with subject knowledge and use current materials that are available in school or online. Training needs are identified as a result of whole school monitoring and evaluation, performance management and through induction programmes. These will be reflected in the School Strategic Development Plan. The Maths Leaders will arrange for relevant advice and information, such as feedback from courses or newsletters, to be disseminated. Where necessary, the Maths Leaders organise school based training through staff meetings/INSET. They will play an important role in

communication with parents/carers to support effective partnerships to help facilitate effective learning at home as well as school.

Additional adults who are involved with intervention programmes will receive appropriate training that may be school based or part of central training.

Monitoring and Evaluation

The Headteacher and Maths Leaders all work together to monitor Maths with the involvement of the governor linked to this area. Having identified priorities, the Maths Leaders formulate the appropriate section of the School Strategic Development Plan (SSDP) often working as part of a bigger team. The SSDP forms the basis for any monitoring activities and will clearly identify when, who and what is to be monitored and how this will take place e.g. classroom observation, planning scrutiny, work sampling etc.

Appendix 1

Week 12 – Consolidation

The Tudors Maths Learning Journey

Weeks 1 and 2 – Measurement: Money

Weeks 10 and 11 – Measurement: Volume and Capacity (Y3)

Co-ordinates (Y4)

Weeks 3 and 4 – Statistics

Weeks 5, 6 and 7 – Measurement: Time

Weeks 8 and 9 – Geometry: Properties of Shapes

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
<u>Measurement: Money</u> Add and subtract amounts of money to give change using both £ and p in practical contexts. **Estimate, compare and calculate different measures, including money in pounds and pence.** **Solve simple measure and money problems involving fractions and decimals to two decimal places.**		<u>Statistics</u> Interpret and present data using bar charts, pictograms and tables. **Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.** Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables. **Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.**		<u>Measurement: Time</u> Tell and write the time from an analogue clock, including using Roman numerals and 12-hour and 24-hour clocks. **Read, write & convert time between analogue and digital 12 and 14 hour clocks.** Estimate and read time with increasing accuracy to the nearest minute. Record and compare time in terms of seconds, minutes and hours. **Convert between different units of measure eg hour to minute.** Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year. **Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days** Compare durations of events (for example to calculate the time taken by particular events or tasks).			<u>Geometry: Properties of Shapes</u> Recognise angles as a property of shape or a description of a turn. Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. **Identify acute and obtuse angles and compare and order angles up to two right angles by size.** Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. **Identify lines of symmetry in 2D shapes presented in different orientations.** **Complete an simple symmetric figure with respect to a specific line of symmetry.** Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. **Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.**		<u>Measurement: volume and capacity (Y3)</u> Measure, compare, add and subtract: mass (kg/g); volume/capacity (l/ml). <u>Co-ordinates (Y4)</u> **Describe positions on a 2D grid as coordinates in the first quadrant.** **Describe movements between positions as translations of a given unit to the left/ right and up/ down.** **Plot specified points and draw sides to complete a given polygon.**		**Consolidation**

Appendix 2

Thakeham Primary School **Maths Weekly Plan**		**Class:** **Week Beginning**: **Week Number**: **Maths Theme**:	**Vocabulary:**	**Y? Objectives:** **Y? Objectives:**	**Mastery Toolkit:** • Stem Sentences • Challenge in the style of PECS and questioning • Representations through CPA Approach • Variation
			Resources:	**SEND: Year ?:** **Year 3 ?:** **PP:** **GDS: Year ?:** **Year ?:**	

Date	Oral and Mental Starter	Learning Objective	Input and key questions	Group Work / Differentiation	Plenary
Monday		Y?: Can I? Y?: Can I **Toolkit** 			
Date	**Oral and Mental Starter**	**Learning Objective**	**Input and key questions**	**Group Work / Differentiation**	**Plenary**
Tuesday		Y?: Can I? Y?: Can I **Toolkit** 			

Date	Oral and Mental Starter	Learning Objective	Input and key questions	Group Work / Differentiation	Plenary
Wednesday		Y?: Can I? Y?: Can I **Toolkit** 			
Date	**Oral and Mental Starter**	**Learning Objective**	**Input and key questions**	**Group Work / Differentiation**	**Plenary**
Thursday		Y?: Can I? Y?: Can I **Toolkit** 			
Date	**Oral and Mental Starter**	**Learning Objective**	**Input and key questions**	**Group Work / Differentiation**	**Plenary**
Friday		Y?: Can I? Y?: Can I **Toolkit** 			

Appendix 3

Maths Marking Code

Can you Prove that your answer is correct?

- *Try a **different method** to answer the same question. Do you get the same answer?*
- *Try doing the **inverse**: work backwards, starting at the answer to prove that you were correct.*

Can you Explain what you have done?

- *Can you write a short 'how to' guide, teaching someone else how to do this skill?*
- *Can you explain in words or with a picture how you know you are correct?*

Can you Choose ...?

- *Choose a method which demonstrates your understanding.*
- *Choose a new way to show your working out/answer*
- *Choose a partner to discuss your reasoning with.*

Can you Solve a problem?

- *Try making up a similar question, using your own numbers.*
- *Try to challenge yourself with larger or trickier numbers.*
- *Can you write a 'real life' maths problem using this skill?*