



Mathematics Policy

1 Introduction

Maths provides pupils with a powerful set of tools with which to calculate, reason and solve problems. The National Curriculum for mathematics describes what must be taught in each year group. At St Andrew's Junior CE (VA), all year groups follow the National Curriculum (2014) using the school's long term plan that covers the objectives. Children need to master key mathematics skills, rather than striving to solely achieve the next objective year on year. The aim of the curriculum is to instill a deeper understanding of mathematics, such that it can be applied to different contexts within the field.

2 Rationale

It is important to create a whole school approach, of which staff, children, parents and governors have a clear understanding. This agreement reflects how essential mathematics is in the education of our pupils. Understanding the relationships and patterns that form between numbers is important for pupils to solve problems, within their education as well as their everyday life. Therefore it is imperative that a positive attitude towards maths is encouraged amongst all of our pupils, in order to nurture self-confidence and a sense of achievement. To help create this attitude we will teach through a concrete, pictorial, abstract (CPA) approach that develops a deep and sustainable understanding of maths.

3 Principles

We ensure that:

- policy and provision are evaluated and reviewed regularly
- resources of time, people and equipment are planned, budgeted for and detailed when appropriate
- the governing body fulfil their statutory responsibility with regard to maths
- cross curricular opportunities are planned for where appropriate
- the planning of maths ensures continuity and progression across all year groups and key stages

4 Aims

<u>General</u>

We aim to provide the pupils with a maths curriculum which will produce individuals who are numerate, literate, creative, independent, inquisitive, enquiring and confident. We aim to provide a stimulating environment, so that pupils can develop their mathematical skills to their full potential.

<u>Specific</u>

Our pupils should:

- enjoy learning through practical activity, exploration and discussion
- have a good number sense and understanding of the size of a number and where it fits into the number system
- recall key facts such as number bonds, multiplication tables and division facts, doubles and halves
- calculate accurately and efficiently, both mentally and in writing, using a range of calculation strategies
- make sense of number problems, recognising the operations required to solve them
- explain their methods and reasoning using the correct mathematical terms
- judge whether their answers are reasonable and have strategies for checking them where necessary
- suggest suitable units for measuring and make sensible estimates of measurement
- explain and make predictions from the numbers in graphs, diagrams, charts and tables
- develop spatial awareness and an understanding of the properties of 2D and 3D shapes

5 Teaching & Learning Style

Our school uses a variety of teaching and learning styles in maths lessons. Our main aim is to develop children's knowledge, skills and understanding in maths.

This is achieved by:

- a daily lesson that has a high proportion of whole class and group directed teaching
- the use of 'Hands on Maths' to encourage the use of CPA approach and to reinforce the curriculum objectives.
- The frequent use of My Mini Maths to consolidate learning and the four operations
- within the week there will be opportunities for children to complete Maths Passports in years 3 and 4.
- a weekly focus on arithmetic and the teaching of strategies to approach such questions
- lessons with a focus on problem solving that teach children different ways and the different strands of problem solving. To aid this, we will use a variety of problem solving resources, including STOPS.
- extension and challenge tasks that move learning on and give children the opportunity to reason and explain why.
- teaching in mixed ability classes, with the support of a teaching assistant in each classroom
- modelling and encouraging the children to use maths talk so that they are able to ask and answer questions whilst explaining their learning and understanding in a confident and coherent manner.
- the use of consistent resources throughout school will ensure that the children learn through a CPA approach that develops a deep and sustainable understanding of maths.
- using ICT to enhance learning, and to complete homework

 encouraging the use and application of their learning in everyday situations, through real life problems and longer investigations.

In all classes, children have a wide range of mathematical abilities. In recognition of this, we provide suitable learning opportunities for all children; matching the challenge of the task to the ability of the child. We achieve this through a range of strategies; through differentiated group work, or paired work on open-ended problems or games. The support of teaching assistants helps to ensure that work is matched to the needs of individuals.

All classrooms have a maths working wall that is consistent throughout school. It links prior learning, shows children the progression of what they are learning, has key vocabulary and examples that children can refer to throughout the week/duration of the topic. Consistently through school we also have Maths Toolboxes that contain key resources that will help aid learning for all and consolidate the concrete, pictorial and abstract way or learning.

Children are set homework tasks which strengthen and consolidate their learning. Alongside this, all children in school have a log in and access to TT Rockstars (an online maths resource where children can complete games and activities related to times tables).

We follow a specific plan for teaching written calculations in maths. Our Written Calculations policy outlines progression in the four operation calculations; addition, subtraction, multiplication & division.

To help motivate children we have a 'Mathematician of the Week', and also have 'Rockstar Battles' where children compete to earn the most points on TT Rockstars. This is then celebrated during Golden Book Assembly.

6 Planning

Maths is a core subject in the National Curriculum. We use the Curriculum 2014 and various resources as the basis for implementing the statutory requirements. We carry out curriculum planning in mathematics in three phases; long-term, medium-term and daily lesson plans. Our long-term plans identify the key strands which we teach throughout the year. Our medium-term plans, adapted from Route Maps, show the order throughout the year, that objectives should be taught to ensure progression through the curriculum that builds on prior learning. The weekly plans list the specific learning objective for each lesson, how the lesson is to be taught and the steps to success. These plans are written by and adapted by the class teacher whilst being shared with teaching assistants who are supporting children in lessons.

7 Maths across the curriculum

Throughout the whole curriculum, opportunities to extend and promote maths should be sought. Links are made with other subjects when relevant, and part of the topic (see Maths across the curriculum document) Maths contributes to a variety of subjects in the primary curriculum, often in practical ways. For example, science makes use of key maths skills such as counting, calculating, estimating and recording information in tables and graphs. Furthermore, skills such as measuring and understanding shape and symmetry often cross curricular in to art, and design and technology. The study of maps in geography relies upon knowledge of co-ordinates, angles, direction, position and scale. Mathematical skills are applied in computing and ICT to enable data handling and the use of spreadsheets and number programmes.

Maths also contributes to the teaching of personal, social and health education. Working outside their normal lessons encourages independent study and encourages them to become increasingly responsible for their own learning. Encouraging the children to work together in lessons, as pairs or teams, encourages discussion of ideas and results, furthering their understanding of mathematics. However this group work also contributes to their social development and interaction.

Nevertheless the prime focus should be on ensuring '*mathematical progress'* delivered discretely or otherwise.

8 Special Educational Needs and Inclusion

Our aim is to provide a broad and balanced education for all pupils. Children with SEN are taught within the daily maths lesson and differentiated for appropriately (e.g. suitable learning style, level of work, numerous small activities to aid concentration, apparatus, adult support).

Children who have been identified as continually achieving below age-related expectations will be taken out, when needed, for individual or small group sessions with a teaching assistant for pre-teaching or targeted work.

How we cater for children who are above age-related expectations

The most able children in maths will be taught with their own class and stretched through differentiated group work and extra challenges to deepen their learning. When working with the whole class, teachers will direct questions towards these children (at their ability level) to maintain their involvement and extend their thinking.

9 Resources

Each classroom has a supply of maths resources that are accessible to children if needed. Those resources which are not used or required regularly are stored centrally and accessed by teachers at the beginning of a topic.

10 Assessment

The ethos of the curriculum is one where we are embedding a depth and mastery of the learning objectives. Assessing children's depth of knowledge and ability to apply this into other contexts is

our priority. We currently use a variety of ways to assess the children in maths throughout the year. Some of the assessment materials we use are:

- White Rose Maths
- Classrooom Secrets
- Testbase Questions
- Rising Star assessments
- NFER tests
- SATs tests
- TT Rockstar analysis tools

The levels the children are working at are entered on to Target Tracker on a half termly basis and those are analysed by SLT.

Children are still legally required to be assessed formally at the end of the Key Stage 2 SATs tests. The results of the end of KS2 assessments will be collected and analysed by the subject leader, and the resulting information will be given to staff to improve the future teaching of maths.

Assessment is regarded as an integral part of teaching and learning and is a continual process. It is the responsibility of the class teacher to assess all pupils in their class.

At St Andrew's Junior CE (VA) school, we strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils. Information for assessment is gathered in various ways: talking to children, observing their work, marking etc. These assessments will be used to plan future work, to ensure pupils are both challenged and supported. Teachers will indicate to children their next steps and learning targets on a regular basis in their books.

Children who receive intervention programmes will be highlighted on the pupil tracker and passed up to the next teacher. This will enable their progress to be tracked and a decision made as to the impact of the intervention programme.

11 Monitoring and Evaluation

The Maths co-ordinator, alongside the Senior Leadership Team, is responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

11 Review

The mathematics policy will be continuously updated and reflected upon in our practice throughout the school year

Intent, Implementation and Impact Statements

Intent

At St. Andrew's, we want every child to be a confident, fluent mathematician. When the children join us from KS1 we continue to develop their mathematical learning in a way that helps them have good number sense. We build upon the principal focus of mathematics teaching in KS1 where pupils have developed confidence and mental fluency with whole numbers, counting and place value. This enables them to continue to confidently reason and approach problem solving in a resilient, positive manner with a range of approaches to assist them.

Our mathematics learning is developed and delivered through a 'spiral curriculum', where skills and knowledge are revisited throughout the year and throughout school. Children have access to concrete materials that help them develop both skills and knowledge. As they grow in confidence, they are able to communicate their mathematical thinking in pictorial and abstract forms.

Maths learning is differentiated to ensure inclusion of all our children. In this way, we give our children the opportunity to flourish not only in education but in life. We teach a broad and balanced curriculum, one that incorporates real life problems and show how maths is used in the world on a day to day basis.

The mathematical learning the children undertake at St. Andrew's enables them to flourish in life and prepares them well, not just for their KS3 education, but for life. We give the children number and mathematical skills that will help them through their adult life and in their future careers.

Implementation

The school has created a long-term plan that meets the needs of the children in our school. The maths leads checks the short and long term plans to ensure coverage of the National Curriculum content and to ensure that fluency, reasoning and problem solving runs through all learning. To embed mathematics learning and knowledge we use concrete and pictorial representations before moving on to the abstract methods- this is something that is also monitored. We re-visit key concepts and topics throughout the year encouraging the children to build on their prior knowledge and use what they already know. By doing this we are developing confident mathematicians who have a good number sense who can achieve depth in their learning.

Lessons are planned to allow all children to access the maths curriculum. Teachers use a variety of resources to ensure all children are challenged, including those working at greater depth. SEND pupils are supported through differentiated learning activities. This may include the children working from a different year groups curriculum, differentiating through outcome, support or through simplifying the learning objective. We are careful to ensure that children do not always have to demonstrate learning through written work in books to ensure we can assess their mathematical skills in ways that are appropriate to children's needs. Where possible, maths learning is practical and active.

As with all subjects, there is much information to take in. In order to help children retain key information we revisit topics in different ways. On a daily basis, children complete tasks that allow them to re-visit and practise using the four operations as well as other areas of maths. Children will either complete a weekly arithmetic test or targeted maths learning as well as taking part in regular problem solving lessons. All of this helps to embed key information and gives children confidence to apply their knowledge.

Assessment is ongoing throughout each maths topic. Teachers ensure they use the Route Maps and the year objective mats (in the back of books) to assess learning and understanding. The mats are updated on a regular basis as well as updating Target Tracker on a half termly basis. AfL is used regularly in lessons and misconceptions quickly clarified. Summative assessment takes different forms but may include a knowledge based test, a maths reasoning or problem solving activity where children demonstrate their learning.

Impact

Each child's individual maths books show that maths is taught regularly and learning recorded in a variety of ways. Outcomes of work are monitored to ensure that they reflect a sound understanding of the key identified knowledge. Teachers can then intervene in a timely manner to clarify misconceptions and revisit areas of learning if necessary.

We know the importance of children learning at a level that is appropriate to their needs. This helps them become confident learners who have a good number sense with a range of strategies to draw upon. Through the teaching at St. Andrews we ensure children have a positive growth mindset and this, along with their number sense means that the children can tackle new learning with confidence. They are able to communicate their understanding and reasoning using mathematical language. Our learners are not phased by new leaning, but instead embrace the challenge and have a resilient attitude that helps them persevere and enjoy their learning.

The outcomes of pupils will be monitored by the class teacher, subject lead and SLT through assessment and marking, tracking, book scrutiny and pupil interviews.

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Building upon prior learning

Key Stage One (KS1)

The aims of the NC in Maths for KS1 state:

The principal focus of mathematics teaching in KS1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources.

During KS1, pupils should have developed their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching will have involved using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. Pupils should be able read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at KS1.

At St Andrew's Infant School we deliver a broad and balanced curriculum that allows each child to reach their fullest potential. We aim to provide children with a powerful set of tools with which to calculate, reason and solve problems, not just at school but in everyday life.

The National Curriculum for Mathematics describes what must be taught in each year group. At St Andrew's Infant School, Years 1 and 2 follow the National Curriculum using the school's long term plan that covers the objectives. Our Curriculum in our Reception Classes ensures that all children receive their entitlement to the Early Years Foundation Stage (EYFS) Framework. Children need to master key mathematics skills, rather than striving to solely achieve the next objective year on year. The children use the AET scheme where they have their core teaching followed by fluency, reasoning and problem solving challenges.

Key Stage Two (KS2)

When children enter KS2 we re-visit and build upon the children's KS1 knowledge by continuing to follow the National Curriculum and Route Maps. We build upon the pre-existing knowledge in small steps. We begin this by using the first half term as a time to teach the children the place value knowledge that is applicable in their year group. We believe that this is incredibly important as this helps build the children's `number sense' and helps them recall key facts and increase fluency.

Throughout the year, we ensure that the maths objectives are taught in small steps ensuring that we are covering and re-visiting objectives as part of our spiral curriculum. The NC says:

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

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Planning and assessment

Number, Geometry, Measurement and Statistics

Number is taught for the majority of lessons in a week. Geometry and measurement are taught through other foundation and core subjects (following on from Chris Quigley training). These areas must be assessed through the year and any areas that the children are not confident in are taught in maths lessons during focused topic weeks during the year. Statistics is introduced in maths lessons and the skills are practised across other subjects, particularly science. The school maths planning sheet should be used.

When planning for your maths lessons you should refer to the National Curriculum 2014 and the year group's maths maps.

Routemap: This helps to plan for progression. Each year's outcomes are ordered in difficulty moving from the bottom and moving upwards. This should help to plan and differentiate. The statements in bold are the KPIs as set out by the NAHT. These are non-negotiable. Each child must be taught these and priority should be placed on pupils being masters in these areas. Once pupils have achieved the bold statements they can be moved to the tier above. The top tier of each year group indicates the end of year expectations where the majority of pupils should end up. The statements are on the long term plan for each year group so clear progression can be seen and that there is a clear start and end point in each area of maths within each year group. The route map strand <u>or</u> the national curriculum focus needs to be on the weekly maths planning.

If pupil/s are not meeting the bottom statement for your year group then refer to the number on the left and the previous year group's expectations. This should only be the case for those children who do not have the foundations from the previous year group.

Route Maps are saved on Staff Share.

Calculation Policy: At school we all follow the calculation policy to ensure that there is a consistent approach to mathematics and methods used across the school. The policy shows progression through each operation and offers concrete, pictorial and abstract ways to answer questions that relate to the NC strands. If children are not ready for pictorial or abstract ways of learning maths then it is important that the concrete stage is covered again to help them achieve the objectives, regardless of their age.

Main teaching/activities/resources: Staff follow the school's individually created LTP to ensure coverage of the curriculum across each year group. Teachers use a variety of resources to teach the maths curriculum, differentiate and create challenges for children. Teaching in school follows the concrete, pictorial and abstract model and children have access to practical resources to help aid their learning and understanding.

Maths talk: when planning there must be opportunities for children to talk and to experience a rich diet of spoken language in order to open up their thinking and learning. By using talk in maths, it will improve children's confidence in maths, promote a positive risk-taking ethos, promote the use

of the precise and correct mathematical vocabulary and help children with their growth mindset. Questions should be asked that require detailed answers. In lessons, teachers will model this and give children sentence stems/prompts to help them articulate their thinking and explanations.

My Mini Maths: A website with different weekly focus activities as well as daily 4 operations questions. Children are completing these on a daily basis.

Hands On Maths: Each year group has a book that has key objectives from the year group to cover during starter activities. These are activities using manipulatives to help embed key concepts. You do not need to go in the order of the book, you can choose appropriate objectives for where you are in the main lessons. These activities will be differentiated appropriately for children who are not working at their year group level.

Passports: Each child has a passport in year 3 and 4. These help to develop the mental mathematical skills. Passports are to be chosen to help children progress individually, there are 'Passport Control' sheets that act as an assessment to see where children are in their learning. The resources for this can be found on the server. Individual activities for the passports are found by clicking on the relevant geographical area. Additional information can be found on the left hand side on the main page. These can also be used multiscreen for situations when different groups are working in different activities. Children need to work through each area The children have to show that they have achieved each objective three times before they move on to the next country/area.

Each child will work through the areas in the world using this order:

England, Scotland, N Ireland, Ireland, Wales, Europe, Asia, Africa, Antarctica, Australasia, North America, South America, Globetrotter, Pangea and Atlantis.

The passports and all resources are saved on Staff Share.

Arithmetic test: A full test is completed weekly in class. In years 3,4 and 5 tests from the maths passport website are used. These can be downloaded from the maths passports website and are also saved in Staff Share. Each child must track their scores in their planners. The tests are changed weekly by using the special formula which creates a new test for each date. When children are confident and are achieving consistently good scores teachers must begin to reduce the amount of time given to answer the questions.

If pupil/s are not meeting the current year group objectives then they should have the arithmetic test for the appropriate level that they are working at. For some pupils, instead of completing the arithmetic tests they may need to complete tasks that are building on their number sense, PPP maths targets or mathematics knowledge.

In year 6, they complete the twinkl arithmetic tests where they complete 36 questions in 30 minutes.

Teachers should keep a record of scores and this should also be out in the children's individual planner. Children should also have a target for their next test and be aware of this.

STOPS: STOPS is a problem solving website that introduces the children to the 8 different ways of problem solving. When using the website use the main grid to select the problem solving strand. Each step comes up with a lesson plan as well as three similar problems. There is also an additional step for advanced solvers. There are videos that explain the different strategies alongside the main grid. On the homepage you can select the whiteboard which allows you to write alongside the problem that you are working on.

- 1. Choose the problem solving strategy that you are going to teach and ensure it is from the correct year group(please try and ensure that you use a variety so children are able to use all the strategies)
- 2. Show the children the problem, stand back and watch what they do. It is critical that you do not intervene, allow the children to be stuck and discuss strategies for at least 5 minutes. If a more-able 'problem solver' solves it quickly, they need to be given a harder problem from the same column of STOPS.
- 3. Choose children to come and share their ideas and lead the discussion, this can be based on valid strategies and misconceptions. The children must feel free to make mistakes and know that mistakes have value.
- 4. From discussion, share the strategy that is being taught in this lesson and model how it could be done.
- 5. Allow children to return to the problem, or a differentiated version using resources identified by STOPS (See Pitstops below)
- 6. Continue independent work, facilitate children's discussions with each other and address the whole class with a mini plenary as appropriate.
- 7. Finish the lesson with a sense of achievement and satisfaction.

Pitstops is where each problem has been broken down into 5 steps that can help you teach the problem, differentiate the lesson and ensure progress. Pitstop 6 is always the original problem. There is also Pitstop 7 that gives extra challenge.

Other resources may also be used for problem solving lessons (see resources section)

Talking Times Tables: This is a set of songs that help children learn their times tables to a rhythm and song. This should be used on a regular basis in class. There is a CD, book and set of bean bags in each classroom.

Working Wall: working walls are used in each classroom and should have the following information on:

- What the children are learning that week
- Prior learning that will assist children in their learning (what do we already know?)
- Key vocabulary (can be added to as the topic progresses/could use the maths dictionaries)
- My Mini Maths focus for that week
- Hands On Maths focus for that week



Assessment

Target Tracker needs to be updated on a half termly basis for maths. Mats in the back of books will be regularly updated with $/_{\ }$ to show if children have achieved objectives. A dot can be used if they have not achieved it yet. Ensure that the correct year group mat is in children's books.

Basic skills: Timestable tests (stored on staff share)

TT Rockstars: Teachers will be sent a link to set up your own password and account. You can set up groups and specific tables for children to work on. You can also see statistical information for your class. There are also paper tests that the children can complete under timed conditions.

White Rose Maths (WRM): each teacher has their own username/password to access resources on the site. These can be used in lessons and when planning. As well as this, the site has assessment booklets that can be used to assess at the end of a term. It looks at reasoning and problem solving learning. There is also an arithmetic test for each term. These are on staff share along with the answer booklets. If using these resources as a way of assessment ensure that you have covered all that is on the assessment. We do not follow the WRM sequence of lessons/planning so it may be that you have not taught what is on the assessment for that term or topic. You can copy and paste/snip questions that are relevant.

Rising Stars: can be used to assess at the start of a topic of work or at the end. Ensure that content is appropriate to what you have taught as the tests follow the curriculum planning sequence from Rising Stars. You should also bare in mind that some of the tests are designed to be used at the end of the year when the children have completed all of the curriculum.

NFER: used at the end of the year to assess children's learning.

KS1 SATs: used as a baseline in year 3 when the children start the year.

Previous KS2 SATs papers: are used throughout the year during year 6 as ongoing assessments in preparation for SATs and to aid teacher assessment.

Mastery Maths (Chris Quigley): this contains practical maths ideas that can be used during problem solving lessons but it also has a checking section with fluency and reasoning questions that could be used as either a pre or post assessment task for children. This can be found on the network.

Ideas for pre-assessment tasks: Basic skills sheets, My Mini Maths, CPG books, key ideas sheets, working walls/mind maps, Rising Stars diagnostic pages, Kangaroo Maths, Diagnostic Questions.



Long Term and Medium Term Plans										
	AND									
Follow the highlighted Route Map to ensure	Year 3 LTP	ted- these are taught throughout the year)								
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Autumn	Spring	Summer								
Number and place value	Number, place value and four operations	Fractions								
Addition and subtraction	Fractions	Measure								
Multiplication and division	Measurement	Geometry								
Measure	Geometry	Consolidation and PS activities								

Year 3 Medium Term plan

Strand Tier	Number and Place Value, approximation and estimation/rounding	Addition, Subtraction, Multiplication & Division (Calculation)	Fractions, Decimals and Percentages	Measurement	Geometry – Properties of Shape & Position and Direction	Statistics
20 End of Year 3 Exp's	 Recognise the place value of each digit in a 3-digit number Solve number problems and practical problems involving each of the below: Compare and order numbers up to 1000 Identify, represent and estimate numbers using different representations, e.g. using Numicon, counting sticks, cubes, 100 squares etc. 	 Write and calculate mathematical statements for multiplication and division using the multiplication tables the children know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems 	 Compare and order unit fractions and fractions with the same denominators Add and subtract fractions with the same denominator within one whole (e.g. ⁵/₇+ ¹/₇ = ⁶/₇) using practical resources and other common denominators Solve problems that involve both of the above 	 Measure the perimeter of simple 2D shapes Add and subtract amounts of money to give change, using both £ and p in practical contexts Add and subtract lengths (m/cmm/m) Add and subtract mass (kg/g) Add and subtract volume/capacity (l/ml) 	 Recognise that angles are a property of a 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 or less than a right angle 	 Solve one-step and two-step questions (e.g. 'How many more?' and 'How many fewer?' using information presented in scaled bar charts, pictograms and tables AU SP SUM
19	 Read and write numbers to 1000 in numerals and in words Find 10 or 100 more or less than a given number 	 Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction Recall and use multiplication and division facts for the 3 times tables Recall and use multiplication and division facts for the 4 times tables Recall and use multiplication and division facts for the 8 times tables 	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators Recognise and show, using diagrams, equivalent fractions with small denominators. (halves, quarters, thirds)	 Tell and write the time from an analogue clock; 12-hour clocks Tell and write the time from an analogue clock; 24-hour clocks Tell and write the time from an analogue clock, including using Roman numerals from 1 to XII Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock/a.m./p.m., morning, afternoon, noon and midnight Know the number of seconds in minute and the number of days in each month, year and leap year Compare durations of events, e.g. to calculate the time taken by particular events or tasks 	 Draw 2D shapes Make 3D shapes using modelling materials Recognise 3D shapes in different orientations and describe them 	 Interpret and present data using bar charts, pictograms and tables
18	Count from 0 in multiples of 50 Count from 0 in multiples of 100 Count from 0 in multiples of 4 Count from 0 in multiples of 8	 Add and subtract numbers mentally, including: A three-digit number and ones A three-digit number and tens A three-digit number and hundreds Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction 	 Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts Recognise, find and write fractions of a discrete set of objects: unit fractions and non- unit fractions with small denominators 	Compare lengths (m/cm/mm) Compare mass (kg/g) Compare volume/capacity (l/ml) Measure lengths (m/cm/mm) Measure mass (kg/g) Measure volume/capacity (l/ml)	Identify horizontal and vertical lines, and pairs of perpendicular and parallel lines	

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Year 4 LTP Fallow the highlighted David Man to answe procession (Some statements are not highlighted, these are tought throughout the year)									
ronow the highlighted Route Map to ensure progression. (Some statements are not highlighted-these are taught throughout the year)									
<mark>Autumn</mark>	<mark>Spring</mark>	Summer							
Number and place value	Number, place value and 4 operations	Fractions, decimals and percentages							
Addition and subtraction	Fractions, decimals and percentages	Measure							
Multiplication and division	Measurement	Geometry							
Measure	Geometry	Statistics- Time graphs							
		Consolidation and PS activities							

Year 4 Medium Term plan

Year 4 Medium Term plan								
Strand Tier	Number and Place Value, approximation and estimation/rounding	Addition, Subtraction, Multiplication & Division (Calculation)	Fractions, Decimals and Percentages	Measurement	Geometry – Properties of Shape & Position and Direction	Statistics		
23 End of Year 4 Exp's	 Round any number to the nearest 10, 100 or 1000 Count backwards through zero to include negative numbers Solve number problems and practical problems involving both of the above 	 Multiply two-digit and three-digit numbers by a one-digit number using formal written layout Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems Solve correspondence problems such as n objects are connected to m objects 	 Find the effect of multiplying a one- or two-digit number by 10 and 100, identifying the value of the digits as thousands, hundreds, tens and ones Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number Round decimals with one decimal place to the nearest whole number Compare numbers with the same number of decimal places up to two decimal places Solve simple measure and money problems involving fractions and decimals to two decimal places (e.g. ¹/₂ of £2.36) 	 Measure and calculate the perimeter of a rectilinear figure/shape (including squares) in cm and m Find the area of rectilinear shapes by counting squares Calculate different measures, including money in pounds and pence 	 Describe positions on a 2D grid as coordinates in the first quadrant Plot specified points and draw sides to complete a given polygon 	 Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs AU SP SUM 		
22	 Recognise the place value of each digit in a 4-digit number Read Roman numerals to 100 (I to C) and know that over time, the numeral system has changed to include the concept of zero and place value 	Recall multiplication and division facts for 6 times table Recall multiplication and division facts for 7 times table Recall multiplication and division facts for 9 times table Recall multiplication and division facts for 11 times table Recall multiplication and division facts for 12 times table Recall multiplication and division facts for 12 times table Recall multiplication and division facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations	 Recognise and write decimal equivalents to ¼, ¼ and ¾ Recognise and write decimal equivalents of any number of tenths or hundredths Round decimals with one decimal place to the nearest whole number Compare numbers with the same number of decimal places up to two decimal places 	 Read, write and convert time between analogue and digital 24-hour clocks Solve problems involving converting from: hours to minutes; minutes to seconds; years to months; weeks to days Convert between different units of measurement (e.g. km to m; hour to minute) 	 Identify acute and obtuse angles and compare and order angles up to two right angles by size Describe movements between positions as translations of a given unit to the left/right and up/down 	 Interpret continuous data using appropriate graphical methods, including bar charts and time graphs Present continuous data using appropriate graphical methods, including bar charts and time graphs 		
21	Count in multiples of 6 Count in multiples of 7 Count in multiples of 9 Count in multiples of 25 and 1000 Order and compare numbers beyond 1000 Find 1000 more or less than a given number	Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate Estimate and use inverse operations to check answers to a calculation Solve addition and subtraction two- step problems in contexts, deciding which operation and methods to use and why	 Count up and down in hundredths Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by 10 Recognise and show, using diagrams, families of common equivalent fractions. (halves, thirds, quarters, fifths, eighths, tenths) Add and subtract fractions with the same denominator 	Compare different measures, including money in pounds and pence. Estimate different measures, including money in pounds and pence	Compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes Identify lines of symmetry in 2D shapes presented in different orientations Complete a simple symmetric figure with respect to a specific line of symmetry	 Interpret discrete data using appropriate graphical methods, including bar charts and time graphs Present discrete data using appropriate graphical methods, including bar charts and time graphs 		
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### Year 5 Medium Term Plan

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Strand Tier	Number and Place Value, approximation and estimation/rounding	Addition, Subtraction, Multiplication & Division (Calculation)	Fractions, Decimals and Percentages	Measurement	Geometry – Properties of Shape & Position and Direction	Statistics
26 End of Year 5 Exp's	Solve number problems and practical problems that involve all of the below (except 'read Roman numerals')	<ul> <li>Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers</li> <li>Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context (i.e. rounding up or down)</li> <li>Solve problems involving multiplication and division including using their knowledge of factors and multiplices, squares and cubes</li> <li>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</li> <li>Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates – (e.g. miles per hour; eggs in a recipe)</li> </ul>	<ul> <li>Read, write, order and compare numbers with up to three decimal places</li> <li>Solve problems involving numbers up to three decimal places</li> <li>Recognise the per cent symbol and understand that per cent relates to 'number of parts per hundred'</li> <li>Write percentages as a fraction with denominator 100</li> <li>Write percentages as a decimal</li> <li>Solve problems which require knowing percentage and decimal equivalents of ¹/₂, ¹/₄, ¹/₅, ²/₅, ⁴/₅ and those fractions with a denominator of a multiple of 10 or 25</li> </ul>	Use all four operations to solve problems involving measure (e.g. length, mass, volume, and money)	<ul> <li>Draw given angles and measure them in degrees (*)</li> <li>Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed</li> </ul>	AU SP SUM
25	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero     Round any whole number up to 1,000,000 to the nearest 10     Round any whole number up to 1,000,000 to the nearest 100     Round any whole number up to 1,000,000 to the nearest 1000     Round any whole number up to 1,000,000 to the nearest 10,000     Round any whole number up to 1,000,000 to the nearest 10,000     Round any whole number up to 1,000,000 to the nearest 10,000     Round any whole number up to 1,000,000 to the nearest 10,000     Read Roman numerals to 1000 (M) and recognise years written in Roman numerals	<ul> <li>Know and use the vocabulary of:         <ul> <li>prime numbers,</li> <li>prime factors and;</li> <li>composite numbers</li> </ul> </li> <li>Establish whether a number up to 100 is prime and recall prime numbers up to 19</li> <li>Recognise and use square and cube numbers, and the notation for squared and cubed</li> <li>Multiply and divide numbers mentally drawing upon known facts</li> <li>Multiply and divide whole numbers and those involving decimals by 10</li> <li>Multiply and divide whole numbers and those involving decimals by 100</li> <li>Multiply and divide whole numbers and those involving decimals by 100</li> </ul>	<ul> <li>Multiply proper fractions and mixed number fractions by whole numbers, supported by materials and diagrams</li> <li>Read and write decimal numbers as fractions (e.g. 0.71 = ⁷¹/₁₀₀)</li> <li>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</li> <li>Round decimals with two decimal places to the nearest whole number</li> <li>Round decimals with two decimal places to one decimal place</li> </ul>	<ul> <li>Measure and calculate the perimeter of composite rectilinear shapes in cm and m</li> <li>Calculate and compare the area of rectangles (including squares), and including squares), and square centimetres and square metres</li> <li>Estimate the area of irregular shapes</li> <li>Estimate the area of irregular (including cubes) and (capacity (e.g. using water)</li> </ul>	<ul> <li>Identify 3D shapes including cubes and other cuboids, from 2D representations</li> <li>Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles.</li> <li>Identify:</li> <li>Angles at a point and one whole turn (total 360°)</li> <li>Angles at a point on a straight line and half a turn (total 180°)</li> <li>Other multiples of 90°</li> </ul>	<ul> <li>Solve comparison, sum and difference problems using information presented in a line graph</li> </ul>
24	<ul> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000</li> <li>Read, write, order and compare numbers to at least 1,000,000</li> <li>Determine the value of each digit in numbers up to 1,000,000</li> </ul>	<ul> <li>Add and subtract numbers mentally with increasingly large numbers</li> <li>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</li> <li>Use rounding to check answers to calculations and determine, in the context of the problem, levels of accuracy</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>Identify multiples and factors, including finding all factor pairs of a number</li> <li>Find common factors of two numbers</li> </ul>	<ul> <li>Recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements &gt;1 as a mixed number (e.g. ²/5 + ⁴/5 = ⁶/5 = ¹/5)</li> <li>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths (e.g. fraction wall)</li> <li>Compare and order fractions whose denominators are all multiples of the same number</li> <li>Add and subtract fractions with denominators that are multiples of the same number</li> </ul>	Solve problems involving converting between units of time     Convert between different units of metric measure     Understand and use equivalences between metric units and common imperial units, such as inches, pounds and pints	Use the properties of rectangles to deduce related facts and find missing lengths and angles     Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	Complete comparison, sum and difference problems using information in tables, including timetables



#### Year 6 Medium Term Plan

Year 6	Medium Term	Plan	TA A	N	20			
Strand Tier	Number and Place Value, approximation and estimation/rounding	Addition, Subtraction, Multiplication & Division (Calculation)	Fractions, Decimals and Percentages	Ratio and Proportion	Algebra	Measurement	Geometry – Properties of Shape & Position and Direction	Statistics
29 End of Year 6 Exp's	Solve number problems and practical problems that involve all of the below	<ul> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>Use their knowledge of the order of operations to carry out calculations involving the four operations</li> <li>Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</li> </ul>	<ul> <li>Use written division methods in cases where the answer has up to two- decimal places</li> <li>Solve problems which require answers to be rounded to specified degrees of accuracy</li> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</li> </ul>	Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	Enumerate all possibilities of combinations of two variables	<ul> <li>Calculate, estimate and compare volume of cubes and cuboids using standard units (mm³ to km³)</li> <li>Recognise when it is possible to use the formulae for the volume of shapes.</li> <li>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate</li> </ul>	<ul> <li>Illustrate and name parts of a circle, including radius, diameter and circumference and know that the diameter is twice the radius</li> <li>Draw and translate simple shapes on the co- ordinate plane, and reflect them in the axes</li> <li>Describe positions on the full co-ordinate grid (all four quadrants)</li> </ul>	Construct pie charts and use these to solve problems
28	Use negative numbers in context, and calculate intervals across zero     Round any whole number to a required degree of accuracy (in context)	<ul> <li>Perform mental calculations, including with mixed operations and large numbers</li> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</li> <li>Divide numbers up to 4 digits by a two-digit whole number using the formal written method of short division</li> <li>When dividing, interpret remainders as whole number remainders, fractions, or by rounding, as appropriate to the context</li> </ul>	<ul> <li>Divide proper fractions by whole numbers (e.g. ¹/₃ ÷ 2 = ¹/₆)</li> <li>Associate a fraction with division to calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ³/₈)</li> <li>Identify the value of each digit to three decimal places</li> <li>Multiply and divide numbers with three decimal places by 10 giving answers up to three decimal places</li> <li>Multiply and divide numbers with three decimal places by 100 giving answers up to three decimal places</li> <li>Multiply and divide numbers with three decimal places by 100 giving answers up to three decimal places</li> <li>Multiply and divide numbers with three decimal places by 100 giving answers up to three decimal places</li> <li>Multiply one digit numbers with up to three decimal places by 1000 giving answers up to three decimal places</li> </ul>	Solve problems involving the calculation of percentages (e.g., of measures) such as 15% of 360) and the use of percentages for comparison Solve problems involving similar shapes, where the scale factor is known or can be found	Generate and describe linear number sequences     Find pairs of numbers that satisfy an equation with two unknowns	<ul> <li>Recognise that shapes with the same areas can have different perimeters and vice versa</li> <li>Calculate the perimeter of parallelograms and triangles</li> <li>Recognise when it is possible to use the formulae for the area of shapes</li> </ul>	<ul> <li>Recognise and build simple 3D shapes, including making nets</li> <li>Find unknown angles in any triangles, quadrilaterals and regular polygons</li> <li>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</li> </ul>	Interpret pie charts and line graphs and use these to solve problems     Construct line graphs and use these to solve problems
27	Read, write, order and compare numbers up to 10,000,000     Determine the value of each digit in numbers up to 10,000,000	<ul> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>Identify common factors, common multiples and prime numbers</li> </ul>	<ul> <li>Use common factors to simplify fractions</li> <li>Use common multiples to express fractions in the same denomination</li> <li>Compare and order fractions, including fractions &gt;1</li> <li>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</li> <li>Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 x 1/2 = 1/8)</li> </ul>	Solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts	Express missing number problems algebraically     Use simple formulae	Use, read, write and convert between standard units using up to three decimal places     Convert between miles and km	<ul> <li>Compare and classify geometric shapes based on their properties and sizes</li> <li>Describe simple 3D shapes</li> <li>Draw 2D shapes using given dimensions and angles</li> </ul>	Calculate and interpret the mean as an average
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Year	Year										
	Science	History	Geography	ICT	Art	DT	RE	French	Music	PSHE	P.E
3	Tables Graphs Measuring Timing	Timelines	Tables Graphs Compass points Coordinates	Tables Charts Timing		Measuring Tables	Emotions graph		Tally chart	Emotions scale	Measure Timing
4	Tables Graphs Measuring Timing Venn and Carroll diagrams	Timelines	Tables Graphs Data collection Tally charts Compass points Coordinates Measuring/conversion	Measuring	3-D shapes 2-D shapes	Measuring	Bar chart	Tally chart Bar chart	Tally chart	Tally chart	Measure Timing Tally charts
5	Tables Graphs Measuring with various resources and different scales Timing Venn and Carroll diagrams Statistics	Timelines	Tables Graphs Flow charts Data collection Tally charts Compass points Coordinates Measuring/conversion Statistics	Measuring 2D Shapes Tessellations Nets	Using a ruler Measurement Scaling 3D shapes	Measuring Pattern cutting 3D shapes Nets Scaling / adapt recipes	Bar chart	Bar chart	Tally chart	Bar Chart Tally Chart	Measure Timing
6	Tables Graphs Measuring with various resources and different scales Timing Venn and Carroll diagrams Statistics	Timelines Calculating time intervals between periods/events	Tables Graphs Flow charts Data collection Tally charts Compass points Coordinates Measuring/conversion Statistics	Measuring Timing	Scale	Measuring Timing Measuring Data collection Conversion Scaling/adapting recipes Measure timing	Charts and graphs		Tally chart		Measure Timing

Maths Across the Curriculum 4

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### Mastery and Mastery with Greater depth in Maths at St Andrew's Junior School

Children who achieve greater depth in maths should be working towards a fuller understanding of the maths curriculum. They should be able to apply the year group expectations to a variety of problems and investigations. They should be able to confidently and coherently represent and explain their reasoning using correct mathematical vocabulary. The way we teach maths at St.Andrew's allows children to do this

The NCETM's definition of mastery includes having a "sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems" and that greater depth means to then go on and "independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics."

The NCETM also state that a pupil really understands a mathematical concept, idea or technique if they can:

- describe it in their own words;
- represent it in a variety of ways (e.g. using concrete materials, pictures and symbols the CPA approach);
- explain it to someone else;
- make up their own examples (and non-examples) of it;
- see connections between it and other facts or ideas;
- recognise it in new situations and contexts;
- make use of it in various ways, including in new situations.

Developing mastery with greater depth is characterised by pupils' ability to:

- solve problems of greater complexity (i.e. where the approach is not immediately obvious), demonstrating creativity and imagination;
- independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics

In order to help children achieve greater depth in maths there are different things to take into account. These are ideas below are based on three 'R's in maths: reflecting, representing and reporting. Many of these ideas cement the NCETM definition of mastery and how we can develop mastery with greater depth.

<u>Reflecting</u>: Children need the breathing space to reflect on an experience when deepening their knowledge and understanding. Pausing, probing and pondering all happen when children are not rushed or pressured. Slowing down allows children to take control of their learning and become aware of their own learning too.

<u>Representing</u>: Children need plenty of opportunities to represent their learning in an active way so deepening becomes memorable. This might be constructing a model, drawing a mathematical picture, using manipulatives or writing down their thoughts.

<u>Reporting</u>: Children have to engage in meaningful maths talk with others – maths has to involve lots of verbal back and forth. Pupils refine, consolidate and develop their understanding by entering into learning conversations with their peers and teacher(s). This type of reporting helps children to realise that their thoughts are valuable and by talking together they can clarify their understanding.

All children should have a deep learning of key ideas/constructs and opportunities for even deeper learning (growth mindset). For some learners they will be able to access, within a construct, even greater challenge to deepen their thinking further. Mastery learning is deep learning that sticks, can be recalled over time etc. It is necessary to have deep learning in order to meet the key objectives. In essence, in order to meet the objectives securely children need to have mastered them.

This diagram helps us to understand concept of mastery and greater depth in the national curriculum:



#### **Resources**

**Maths boxes:** practical, concrete resources are used regularly. Ensure that you think about resources you could use when you are planning and have the boxes easily accessible for children.

#### Classroom Secrets: <u>https://classroomsecrets.co.uk/</u>

This website is full of learning resources that are differentiated and have teaching powerpoints. Each set of resources has fluency, reasoning and problem solving questions. The website also has discussion questions that can be used in problem solving lessons. There are homework and extension questions also that can be used as an extension or assessment. You may want to check and ensure there is clear differentiation on the resources and not just, for example, 'bigger' numbers used in questions.

#### White Rose Maths: <a href="https://resources.whiterosemaths.com/">https://resources.whiterosemaths.com/</a>

This website has the learning objectives set out in steps with great fluency, problem solving and mastery questions that can be used in learning or as challenges/moved on tasks. Also, there are good planning ideas and good termly assessments that cover the objectives. In addition, you can access practice questions for students that run alongside exemplar questions for teachers to use in class that can be used to consolidate learning.

**I See Reasoning:** PDF documents available on Staff Share for LKS2 and UKS2. **It is** written to provide rich, open contexts for mathematical discussion and enquiry. Children build on their current understanding when solving '*I know... so...*' questions. Concepts are represented visually in '*Read the picture*' tasks. Children can also work systematically to find all possible solutions for the '*How many ways?*' challenges.

**I See Problem Solving:** PDF documents available on Staff Share for LKS2 and UKS2. This helps all children to learn how to solve multi-step maths questions. Tasks start with a *Build* prompt, which leads into the main *Task* question. Each page can be printed and given to the children. There are also *Support, Explain* and *Extend* prompts for most tasks –these provide additional support for the main task or extra challenge to take the learning deeper.

#### I See Maths: <u>www.iseemaths.com</u>

This is the website created by the same people who created 'I See Reasoning' and 'I See Problem Solving'. It has good resources on the website including:

 Times table resources that are visually represented (could be used for subitising activities etc)

- 3 Act Tasks- resources for problem solving that could also help maths talk within the classroom. It has a video and question prompts that set the context of the problem, solving of the problem and the answers.
- Games and resources

### BBC Bitesize: https://www.bbc.co.uk/bitesize

**Mastery Maths (Chris Quigley):** practical activities that support fluency, reasoning and problem solving. It has examples of activities that are inter connected and give specific advice for developing subject knowledge. The activities can all be found on the server. (The master copy of the paper folder is kept by the maths lead)

### Target Your Maths (text books)

**Abacus resources (text books)** In school we have the books from Y3 to Y6. There are three books for each year group.

**Testbase:** SATs style questions that test understanding and can be used for pre-assessment or at the end of a topic of work. Questions can be searched for by stand or age range.

**Twinkl:** lots of mastery and challenge resources available as well as pre assessment and bar modelling examples. Also have morning work challenge powerpoints with good open ended maths questions on.

**Third Space learning**: an organisation that has released `fluent in 5' and `rapid reasoning' resources to help with fluency and reasoning. They also have good lesson resources and slides that can be used. These are saved in staff share.

**Nrich/NCETM(you will need to set up a username/password to use this site):** problem solving resources that have different levels and encourage problem solving and the use of mathematical language. Also, NCETM is very good for your own pedagogical knowledge/subject knowledge if you feel you need to brush up on any areas.

**Negotiating meaning sheets:** these can be used to assess understanding of an area in maths and can be added to as the week/topic goes on.

BAM (Building A Mathematician) (<u>www.kangaroomaths.com</u>)

**Maths Everyday**: <u>www.mathseveryday.com</u>: a website that has many maths problems on, apparently there is a new one everyday.

**Numeracy/mathematics Shed (<u>http://www.mathematicshed.com</u>): a** variety of resources for teaching and for children to use.

**Badger Maths:** on staff share there are a variety of problem solving resources that can be used.

**Diagnostic Questions:** <u>https://diagnosticquestions.com/</u> the website has different diagnostic questions for different areas of the maths curriculum for each year group. These could be used for pre/post assessment, challenges and reasoning activities. You will need to sign up for this website.

