

# Maths Handbook

St. Andrew's CE Infant School



## Our School Motto

**'Learning, Caring and Growing together in Faith'**

## Our Vision

St Andrew's Infant School is a Christian school where children are happy, nurtured and love learning. Through an inspiring and aspirational curriculum, we strive to ensure our children flourish spiritually, academically, and creatively to become confident, resilient learners. Everyone here learns, cares and grows together in faith.

## Intent

***'Good mathematics is not about how many answers you know. It's about how you behave when you don't know.'***

At St Andrew's we foster positive can-do attitudes. We believe all children can achieve in mathematics, and by using a mastery approach we teach for secure and deep understanding of mathematical concepts through manageable steps. At our school, children will spend time becoming true masters of content, applying and being creative with new knowledge in multiple ways. We develop skills essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Our Maths curriculum allows our children to:

- become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically using mathematical language.
- be able to solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios.
- have an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately to be successful in mathematics.

At St. Andrew's CE Infant School these aims are developed in tandem with each other. However a key focus in every lesson is deep conceptual understanding, and it is from this that children will build their fluency, their ability to reason and apply this understanding when solving problems. We hope to build problem-solvers of the future and build resilience in our children; essential skills they can use in all aspects of their learning.

## **Implementation**

In Early Years we use a variety of resources including White Rose Maths, NCETM, Numberblocks and Lancashire materials, which we adapt and tailor as appropriate to match our personalised overview. Learning is organised into progressive steps that build a coherent sequence of learning across the year. It begins with children being immersed in the numbers 1-10, where children develop a deep understanding of each number, including composition and how these numbers relate to each other.

In Key Stage One we follow the Red Rose Mastery resources, which we adapt and tailor as appropriate. We have selected this because it is sequenced coherently across and within year groups. Additional quality resources such as White Rose Maths and NCETM materials are used if needed to meet the needs of our children. This mastery approach ensures that our children have full coverage of the Maths National Curriculum. The key components of place value and calculation are explicitly taught and learned in each term. These topics are interspersed with other areas of the mathematics curriculum such as measurement including time and money, statistics and geometry. This allows children to apply their number knowledge in different contexts to build strong connections within mathematics and appreciate the subject's relevance to real life. It also supports children in transferring their learning to long term memory in order to unconsciously recall and apply it in different situations, including in different curriculum subjects.

It allows our children to revisit topics several times over the year allowing their knowledge to deepen. All children are catered for within maths lessons ensuring that we have high expectations, offering the necessary support and challenge for each individual to make progress. The expectation is that all children will move through the content of our curriculum at broadly the same pace. In some circumstances, children may need different resources to meet their individual needs. Interventions are used to ensure children are ready for their next maths lesson.

We ensure that maths is taught in creative and engaging lessons using a wide array of maths manipulatives to aid and support our children in their learning. Children in Key Stage 1 access 'Maths Toolkits' which are on their tables during maths lessons. Resources in toolkits are built upon throughout each year group. In Reception, children use a wide range of manipulatives both in structured maths sessions and in provision, enabling them to apply their knowledge independently.

New mathematical concepts are introduced using a concrete, pictorial and abstract approach; enabling all children to experience hands-on learning and allowing them to have clear models and images to aid their understanding. ICT is used to enhance the delivery of the maths curriculum including the use of Sumdog in Key Stage One to support home learning.

Mathematical vocabulary is an essential part of each lesson and the children need to understand this within the area they are studying and be able to make rich connections. Each lesson provides children with the opportunity to reason through their ideas, use their mathematical language to explore a line of enquiry and problem solve therefore developing their communication skills.

Children are taught Mathematics for approximately 1 hour daily. In addition to this, Key Stage 1 children have Mastering Number sessions for 10 minutes, four times per week. In Early Years, Mastering Number is included within daily maths lessons.

The teachers have a flexible approach to the structure of their daily lessons so that they can reach the needs of an ambitious maths curriculum. Maths is taught discretely and is then applied across the curriculum and in continuous provision in EYFS and through challenges in Key Stage One.

In Early Years, maths lessons consist of daily small group teaching sessions and if appropriate, a short taught element to the whole class. This will be very practical and involve a considerable amount of discussion including questions such as What can you see? What do you notice? Why do you think that happens? What would happen if...? Children will then be given opportunities to apply this learning in different ways. Maths is also experienced through many daily routines and adults take advantage of all the opportunities for mathematical learning in such activities as registration, snack time and tidying up.

However, all maths lessons must have the following key elements:

- Opportunities to embed previous learning and build next steps for learning.
- Modelling by the teacher and discussions as a class using mathematical vocabulary.
- Independent activity – a variety of fluency, reasoning and problem-solving activities presented in different ways.
- Teacher assessment of understanding.
- Questioning to let the children demonstrate what they know and to challenge.

### **Maths Working Wall**

In every classroom, we have a working wall for Maths. The following non-negotiables have been put in place and can be seen on these working walls, relating to the current unit being taught:

- 'We are learning...' title
- Specific vocabulary used in stem sentences and shown in context
- Models to help us (examples modelled by the teacher)
- Challenges with varied fluency

It is expected that teachers refer to working walls regularly, using them as a teaching tool to support learning.

### **Presentation of Work**

Children use pencil in their maths books. They use appropriate maths exercise books for their stage of development. Children must use one digit per box when recording on paper in Key Stage One. Children are encouraged to record their working out / mental jottings in their book.

## Resources

Key Stage One classes have maths toolkits. These start empty at the beginning of each year and build up, as the children are taught how to use the resources. Reception have maths resources in their classroom. There is also a central maths cupboard with resources for all to use.

## Additional Documents

In addition to this Maths Policy, the following documents are in place to support the implementation of Maths:

- Progression in Mathematics
- Arithmetic Expectations
- Calculation policies for the 4 operations
- Red Rose Mastery resources
- NCETM materials
- Mastering Number Resources
- White Rose resources

## Planning

The planning of the curriculum is organised in three phases:

- Long term planning is demonstrated through the yearly overviews which show the organisation of the mathematics topics across the year for each year group, and the coverage and progression of knowledge, skills and understanding.
- Medium term planning is demonstrated through the unit overviews which reveal the progression of knowledge, skills and understanding within each topic, including where learning is revisited in starters for year groups.
- Short term planning is demonstrated through weekly overviews, SMART notebook or PowerPoints used that are personalised to meet the needs of the children in each class.

## Formative Assessment

Teachers use their professional judgement to decide what children need to learn and when to move on to the next step of learning. Formative assessment (or responsive teaching) is a key feature of mathematics lessons. Teachers use effective questioning to determine the extent of children's understanding before deciding on what the children need next (support, extension, next steps).

## Summative Assessment

Children in Reception will complete baseline assessments in September and will then be assessed at the end of each term. Assessments will be made based on children's understanding throughout lessons including during provision.

Children in Key Stage One are assessed at the end of each term using teacher assessment supported by an arithmetic and a reasoning test. This allows teachers to

check children's progress towards meeting end of year expectations and organise further support where this is necessary. At the end of each half term, there are 'Learning Checks' that consist of a range of questions based on what the children have learned in that half term. These allow teachers to assess the children's understanding away from the point of teaching and to see how well the learning has been stored in the long-term memory.

## **Impact**

We assess the impact of our curriculum in a variety of ways.

These include:

- Observations
- Looking at books
- Pupil discussions
- Regular recall and retrieval activities
- Targeted questioning
- Effective marking and feedback
- Teacher assessment against key performance indicators
- Formal testing at summative points.
- Analysis of data

We use these strategies to review our curriculum offer, inform our strategic action planning and make adaptations where necessary. Monitoring of our maths curriculum is carried out regularly and includes the maths subject leader, SLT and governors. A maths report is completed and given to governors each term.

We know our maths curriculum is effective when we see:

- Children are fluent in the fundamentals of mathematics with a conceptual understanding
- Children can recall and apply knowledge rapidly and accurately
- Children have the skills to solve problems by applying their mathematics to a variety of situations with increasing sophistication
- Children who are able to reason mathematically using mathematical language.
- Children show confidence and believe they can learn about a new maths area and apply the knowledge and skills they already have.
- Through discussion and feedback, children talk enthusiastically about their maths lessons and speak about how they love learning about maths. They can articulate the context in which maths is being taught and relate this to real life purposes.

Reception Overview						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Week 1	Baseline Assessments Matching, sorting, comparing and patterns <b>Just like me!</b>	Shape linked to 1, 2 and 3 <b>It's me 1,2,3!</b>	Representing 0 <b>Alive in 5!</b>	Comparing height and length Days of the week <b>Growing 6,7,8</b>	Numbers 11 to 20 Including patterns, ordering, missing numbers, recognising numbers <b>To 20 and beyond</b>	Adding and taking away including money <b>First, then, now</b>
Week 2		Representing, sorting and comparing 4 and 5 (including money and time) <b>Light and dark</b>	Composition of numbers to 5 Comparing numbers to 5 <b>Alive in 5!</b>	Representing and sorting 9 and 10 <b>Building 9 and 10</b>		
Week 3		1 more, 1 less and composition of number Early doubling <b>Light and dark</b>	Measure (including heavy, light, full, empty and capacity) <b>Alive in 5!</b>	Ordering and composition 9 and 10 (including 1 more, 1 less and doubling) <b>Building 9 and 10</b>		Halving, doubling and sharing <b>Find My Pattern</b>
Week 4		Representing, sorting and comparing 1,2 and 3 (including money and time) <b>It's me 1,2, 3!</b>	Representing, sorting and combining 6, 7 and 8 (including 1 more, 1 less and doubling) <b>Growing 6,7,8</b>	Comparing and making 10 <b>Building 9 and 10</b>		
Week 5	1 more, 1 less and composition of number <i>It's me 1,2,3!</i>	Shape linked to 4 and 5 <b>Light and dark</b>	-	-	-	3D shape and pattern <b>Building 9 and 10</b>
Week 6						Consolidation of skills Problem solving <b>On the move</b>
Week 7						

**Year 1 Overview**

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Week 1</b>	Place Value <b>Unit 1</b>	Sequencing and Sorting <b>Unit 5</b>	Place value <b>Unit 10</b>	Measure - Length <b>Unit 16</b>	Place Value <b>Unit 21</b>	Time <b>Unit 27</b>
<b>Week 2</b>		Fractions <b>Unit 6</b>	Measure – mass/weight <b>Unit 11</b>	Addition and Subtraction <b>Unit 17</b>	Addition and Subtraction <b>Unit 22</b>	Multiplication and Division <b>Unit 28</b>
<b>Week 3</b>	Measure – Length <b>Unit 2</b>		Counting and Money <b>Unit 13</b>	Fractions <b>Unit 18</b>	Capacity and Volume <b>Unit 23</b>	Statistics and Calculation <b>Unit 29</b>
<b>Week 4</b>	Measure – mass / weight <b>Unit 2</b>	Money <b>Unit 8</b>	Multiplication <b>Unit 14</b>	Assess and Review <i>Arithmetic &amp; Reasoning Tests</i>	Fractions <b>Unit 24</b>	Assess and Review <i>Arithmetic &amp; Reasoning Tests</i>
<b>Week 5</b>	Addition and Subtraction <b>Unit 3</b>	Assess and Review <i>Arithmetic &amp; Reasoning Tests</i>	Division <b>Unit 15</b>	Geometry: Position and Direction <b>Unit 19</b>	Position & Direction and Time <b>Unit 25</b>	Measurement <b>Unit 30</b>
<b>Week 6</b>		Time <b>Unit 9</b>	2D and 3D shape <b>Unit 12</b> <i>Learning Check</i>	Time <b>Unit 20</b>	2D and 3D shape <b>Unit 26</b> <i>Learning Check</i>	Sorting and Sequencing <b>Unit 31</b>
<b>Week 7</b>	2D and 3D shape <b>Unit 4</b> <i>Learning Check</i>	Capacity and Volume <b>Unit 7</b>	-	-	-	Consolidation of Skills



Year 2						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Week 1	Place Value Unit 1	Counting, Multiplication & Sorting Unit 5	Place value Unit 11	Measure Unit 16	Number and Place Value with Statistics Unit 21	Addition and Subtraction Unit 28
Week 2		Statistics Unit 6	Measurement – mass /weight Unit 12	Addition and Subtraction Unit 17	Addition and Subtraction Unit 22	Multiplication and Division Unit 29
Week 3	Measure - Length Unit 2	Fractions Unit 7	Addition and Subtraction including with money Unit 13 Unit 14	Fractions, Position & Direction Unit 19	Capacity and Volume Unit 23 Temperature Unit 24	Statistics & Calculation Unit 30
Week 4	Measure – Mass/weight Unit 2	Assess and Review <i>Arithmetic &amp; Reasoning Tests</i>		Assess and Review <i>Arithmetic &amp; Reasoning Tests</i>	Fractions Unit 25	
Week 5	Addition and Subtraction Unit 3	Time Unit 10	Multiplication and Division Unit 15  <i>Learning Check</i>	2D and 3D shape Unit 18	Time, Position & Direction Unit 26	Assess, review and address gaps <i>Assessment</i>
Week 6		Money Unit 9		Time Unit 20	2D and 3D shape Unit 27 <i>Learning Check</i>	
Week 7	2D and 3D Shape Unit 4 <i>Learning Check</i>	Capacity and Volume Unit 8 and Unit 12	-	-	-	

## **Features of a Teaching for Mastery Lesson**

Whilst Teaching for Mastery is a particular philosophy and approach to teaching mathematics, each lesson should be planned and delivered on an individual basis informed by the children's existing understanding and the complexity of the new learning. It is important that teachers are flexible to meet the individual needs of the children in their class.

Many of the features listed may be present, but not necessarily all of them. Therefore, the features list should not be used as a tick list for every lesson but merely as a guide.

### **Starter**

Starter based on one of the following:

- assessing prior learning of the next unit of work
- assessing learning from the previous unit/week
- assessing learning from the unit/week two weeks previous
- arithmetic fluency: recall of facts; rehearsal of procedures; making appropriate decisions; recognising calculations in different contexts
- areas of the curriculum that have not been covered for a long time - particular class issues.

### **Main Part**

Discussion prompt to introduce the learning. This may be a problem or a visual stimulus (practical or pictorial).

### **Modelling**

The majority of the children working on the same content at the same time.

A starting point that begins with children's existing understanding.

Small, coherent steps detailing the progression from existing understanding to the new learning.

Visuals that support children in understanding the concept being learned, including any mathematical structures, and questions leading the learning as opposed to direct instructions.

Carefully chosen conceptual variation leading children to identify what the concept is, and what it isn't.

Use of questions:

- what is different about... and...?
- what is the same about... and...?
- what do you notice?
- why does this happen? A greater emphasis on reasoning about the mathematics.

Explicit links being made between concrete and abstract; concrete and pictorial; pictorial and abstract.

Consistent language structures being applied regardless of the representation, possibly supported by actions.

Children answering in full sentences, e.g. answering  $3 + 4$ , by saying '*three plus four equals seven*' rather than just saying 'seven'.

Verbal repetition of the most important language structures for the learning.

Sometimes the children creating or repeating a generalisation / rule / conclusion for the learning.

Sometimes a 'ping pong' approach to modelling.

Interactive modelling with discussion followed by children's task followed by discussion, then repeated to take the children's learning on.

The TA may be used for different purposes such as, to support children in focusing on the learning; to model the learning on a more personal basis for a child/small group using practical equipment of the teacher's modelling; or to work with a child or small group who are not ready for the same learning of the others in the class.

### **Children's Task**

Children are likely to be sat in mixed ability groups initially.

Visuals that complement the modelling by the teacher.

Procedural variation taking the children's learning from existing understanding to new learning to deep understanding of the new learning for all.

Teacher and TA reacting to how children are understanding the new learning, providing support and extension to a greater depth of understanding as necessary.

Sometimes, ability groups will evolve during the lesson where children with common needs are moved together for ease of management in the class, such as children being exposed to the same extension to greater depth task or children requiring the same supporting equipment or questioning.

The TA again may be used for different purposes. If not working with a separate group, they would mimic the approach of the teacher, monitoring the children's understanding of the new learning and reacting accordingly.


### **Other**

Use of past test questions should feature in every year group, in order to familiarise children with the presentation of these questions and how they can be approached.


Children need to be exposed to the new learning independently and away from the point of teaching, and the relative safety of the discussion and modelling.

Similarly, reasoning and problem solving are best approached collaboratively but children should also have the opportunity to work independently on these types of tasks.

**Planning Template to be used in all year groups for each unit of learning.**


 <p><b>St. Andrew's CE Infant School – Maths Medium Plan</b></p> <p><b>Term:</b> _____ <b>Class:</b> _____</p>	<p><b>Area of study:</b> _____ <b>Week commencing:</b> _____</p>
<p><b>End of Unit Expectations</b></p>          <p><b>End of Year Expectations</b></p>	<p><b>Children's Starting Points</b> (<i>what can children do and understand related to the main learning, check in Starters of previous week, look back in children's books to previous time the learning was visited</i>)</p>
<p><b>Progression through the unit/week</b> (<i>use identified starting points, consider the order of the learning objectives, which ones require specific teaching, which can be grouped together in the same lesson, which are integrated within others, progression in approach – moving from concrete to pictorial to abstract representations, the development of practice, application and reasoning</i>)</p>	<p><b>Key Vocabulary</b></p>

**St. Andrew's weekly Maths Planning – Reception**

 <b>St. Andrew's CE Infant School – Maths Weekly Plan</b>				<b>Term:</b> <b>Class:</b> <b>Unit:</b> <b>Week Beginning:</b>
Day	Recap	LO	Input	Focus Activity
Mon				
Tues				
Wed				
Thurs				
Fri				

*Weekly Planning for Y1 & Y2 is in the form of SMART notebook / PowerPoints that must be saved in the shared drive.*

*Teachers may also use this planning template to support them.*

 <b>St. Andrew's CE Infant School – Maths Weekly Overview Y1 &amp; Y2</b>		<b>Term:</b> <b>Class:</b> <b>Unit:</b> <b>Week Beginning:</b>
<b>Day</b>	<b>LO</b>	<b>Task</b>
<b>Mon</b>		
<b>Tues</b>		
<b>Wed</b>		
<b>Thurs</b>		
<b>Fri</b>		

Learning, Caring and Growing Together in Faith  
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## Spirituality in...

challenge

respect

resilience

support

## Maths

confidence

patience

appreciation

culture

reflection

change

explore

teamwork

communication





