

St Andrew's C of E Junior School

Mathematics Policy

"Mathematics is the alphabet with which God has written the universe." Gallileo Galilei

This policy aims to outline the teaching, organisation and management of Mathematics at St. Andrew's C of E Junior School.

Mathematics is a core national curriculum subject that equips pupils with vital skills that they will need to use throughout their everyday lives. It is therefore important to encourage children to develop and nurture a range of strategies to help them solve problems, make links with other subjects and grow in confidence in the understanding of numbers.

Through the teaching of Mathematics at St. Andrew's we aim for all children to develop:

- A broad and deep understanding of the different strands of the National Curriculum
- A positive and enthusiastic attitude towards Maths.
- A broad range of skills which can be applied both within school and within everyday lives.
- A wide range of written and mental calculation strategies that they can use to solve problems.
- Their ability to reason and ask questions of their learning, allowing them to create proofs and generalisations.
- A deep and lasting interest in Maths and an understanding and awareness of the jobs and vocations that involve mathematics.

1. Mastery

1a. St. Andrew's has been involved with the Turing Maths Hub to promote and implement a mastery approach towards the delivery of Maths across the school. The Maths co-ordinator is an NCETM Primary Mastery Specialist and is responsible for overseeing the development of mastery across the school.

1b. The mastery approach that has been recognised as a key part of successful mathematics in countries such as Singapore is applicable to children of all abilities and goes beyond lessons and activities being differentiated. Through the use of a mastery approach in lessons, where children are given opportunities to reason their ideas, they gain a wider understanding of their learning and, consequently, are enabled in making deeper connections. Teachers look for opportunities to deliver the mastery approach in lessons and ensure that children feel comfortable in their ability to reason and are celebrated in doing so. Teachers also use NCETM materials to deliver elements of assessing children's mastery skills in lessons and give children opportunities to develop these skills through learning. In addition to this, materials from the White Rose Maths Hub are used to supplement lessons and support staff with the ongoing implementation of a mastery approach.

2. Planning and Teaching

2a. Fluency, reasoning and problem-solving are the three main aims of the 2014 National Curriculum for Mathematics, set out by the Department of Education. These core aims underpin all Mathematics lessons at St. Andrew's and teachers should seek to integrate the development of these skills into their lessons on a daily basis. Lessons are designed so that problem-solving is the driver for all learning.

2b. Giving children the chance to talk about their learning is key, especially in Mathematics, and the quality of the talk is important. This doesn't involve a child simply sharing how they did a particular calculation, but describing why and how it worked, and how their method is the same or different to those of others. Children are encouraged to reason in their books using red pens to record this. During lessons they may be prompted to do so by staff; however, children know that they can use their red pens to record any key learning they deem important.

2c. Vocabulary pyramids are displayed in classrooms and actively used in lessons to organise specific vocabulary that is being used in the current strand of work by the class. There is a wealth of key vocabulary in the Mathematics curriculum and it can become overwhelming for children to develop a necessary understanding of terminology unless it is actively developed alongside conceptual and procedural teaching. When vocabulary comes up in lessons, it is added to the classroom pyramid with the direct involvement of the class. Each pyramid consists of 3 tiers and the children decide which tier each term best belongs to: the first tier is for words the class know and have a thorough understanding of, the second tier is for words that the children should or need to know about for the current strand being studied but they don't yet have a good enough level of understanding of, and the third tier is for ambitious terms that may appear in the strand but aren't compulsory for the level of work being studied. For example, a Year 6 class studying number and place value may have the terms **ascending**, **integer** and **recurring** in tiers 1, 2 and 3 respectively. Pyramids are updated at the start of each new strand of work and may refer back to strands taught earlier in the year, for instance when the fractions strand is taught at various points in the calendar.

2d. Through the use of reasoning and being given the chance to make generalisations and proofs in their learning, children are enabled to make active progress in their understanding of key mathematical concepts, both abstract and concrete.

2e. St. Andrew's follows the White Rose Maths Hub's long-term plan for all year groups. Teachers amend the medium-term plans to suit the needs of their class and update these on a termly basis. Each class teacher is responsible for the planning of weekly lessons in Mathematics for their class, although this may be delegated across year-group teams. Teachers are not given a planning format to use but they must ensure that lessons present suitable challenge for the children and that key skills are addressed regularly, and not left to be taught in explicit lessons. Opportunities for the children to reason are actively planned into lessons, alongside opportunities for them to discuss their thoughts in groups or as a class.

2f. Towards the start of every Mathematics lesson, the teacher will display a 'traffic light' set of 3 questions/calculations to the class. Next to each one is either a red, yellow or green indicator representing the following:

Red – there is an expectation that this is a calculation that requires a written algorithm

Yellow – there is an expectation that this is a calculation that requires some notes to be made but not to the extent of using a full algorithm

Green – this calculation should be able to be completed mentally or there is a ‘trick’ that the children should look to identify.

The traffic light questions are usually chosen to represent learning that has taken place that week, the previous week, and the previous month, in-line with research into metacognitive approaches and the way in which children can develop meaningful, long-term learning and understanding.

2g. Children will make mistakes. At St. Andrew’s, they use the school-wide LEARNER acronym to develop a growth mindset, turning mistakes into important steps in the learning process.

2h. Delivery of the Mathematics curriculum should provide children with the opportunity to engage in practical activities, including maths games and problem solving investigations, as well as written work. These activities can be done individually, in small groups or as a whole class and opportunities to use ICT as a tool to aid learning should be provided where necessary. Lessons should be engaging and interactive and take into account the different learning styles of the children in the class.

2i. It is important to ensure that the children see and use Mathematics in as many practical contexts as possible. Throughout the curriculum, opportunities exist to extend Mathematics. Opportunities to implement the subject across the curriculum are actively sought and addressed.

2j. At St. Andrew’s CE Junior School, we believe that the children should have purpose in their learning, and this is no-less important in Maths. With this in mind, teachers seek to look for opportunities to outline to children certain professions and vocations in which the strand of mathematics that the children are studying applies to. For example, calculating perimeter in Year 4 has links to building and construction. We want children to know that their learning has a purpose, whilst at the same time broadening their horizons as to the applications of such a key subject.

3. Equal Opportunities

3a. Mathematics at St Andrew’s is taught with equal opportunities for all children throughout the school. It is important that:

- Our expectations do not limit pupil understanding.
- We aim to challenge and extend children to help them increase the need for independent thinking.
- We use a full range of teaching and learning styles to ensure that all our children have the opportunity to gain knowledge and understanding regardless of their gender, race, class, and physical or intellectual ability.

4. Skills

4a. In addition to a secure understanding of number, calculation and number facts there are other essential skills for high quality Mathematics learning, which include:

- Problem solving – knowing the strategies and resources which need to be used to solve a problem.
- Communicating – being able to explain their results verbally and in written form, using mathematical language and symbols.

- Reasoning – being able to think logically and justify their ideas. These skills can also be transferred into other learning and in everyday life and opportunities should be regularly planned, for the children to be able to practise and develop these.

5. SEND

5a. A mastery approach involves the majority of children who are able to access the year group standard relevant to them working together as one, with children usually working in mixed-ability groups. Some children, particularly those receiving SSSEN support, may work in a separate group to support their individual needs. Small intervention groups also exist so that pre-teaching and the coverage of key skills can be afforded to children who require additional support.

6. Assessment

6a. Assessment of Mathematics is ongoing and teachers will judge children's abilities against their respective National Curriculum objectives. These are actively referred to in lessons and children are aware of what their targets are.

6b. A summative assessment takes place at the end of the Autumn, Spring and Summer terms in the form of the White Rose assessment materials. Data is then recorded using iTrack. As a result of this, children identified as making insufficient progress are discussed in pupil progress meetings and necessary future actions are taken.

6c. Parents are informed of their child's progress at parent's evening and in end of year reports. A summary of results is passed onto the next teacher so an initial picture of the class' strengths and weaknesses can be identified.

7. Marking

7a. Children's books are marked in line with the school's active feedback policy. This then informs future lessons and activities. Next steps guidance is given to children as active feedback at the beginning of the next relevant lesson. Staff consider the notion that as they are marking and assessing work they are correcting a skill and the child rather than the calculation. Children are encouraged to respond to marking by either correcting mistakes or improving work (done in purple pen); this demonstrates an open dialogue to help improve and move learning forwards. Children may also do their own self-assessment and peer-assessment during lessons (done in purple pen).

8. Presentation

8a. Children are regularly reminded of the high expectations for the presentation of their work. The date is always written in digits (in the format dd/mm/yy). A line is missed before writing the learning objective (LO) and another line is left before work begins. The LO in children's books will mostly be in the form of code that links to the statutory requirements listed in the front of their exercise books. For example, MD2 in a Year 4 exercise book will refer to the objective, *'I can multiply and divide numbers by 10 and 100.'*

8b. Children are expected to write one digit per square and are informed of the difference between the terminology of 'digit' and 'number'.

8c. When the children answer questions they should leave a blank line between each answer, ensuring that the answers are legible and that they have shown any calculations as instructed.

9. Homework & Online platforms

9a. Opportunities should be provided for children to practise their mathematical skills at home with the support of their parent/carer. These activities will help to promote children's Maths in a wider context other than school.

9b. Homework is distributed at the discretion of the class teacher. Similar expectations are upheld across year groups for consistency. No piece of homework should take more than 20 minutes to complete at home and should always complement work already done in lessons, rather than introduce new learning. We have a subscription to the MyMaths website where teachers can set homework tasks for their class. Teachers may also choose to send home paper-based work if they feel the need to.

9c. All children in the school are also given log on details for the Times Tables Rockstars website (including Numbots in Y3 where necessary), enabling them to play online maths games at home and at school. As much as this is not homework, children are encouraged to play as often as they can, to develop the speed, fluency and accuracy of their mental arithmetic.

10. Resources

10a. Tactile resources are used in lessons to support learning. This happens across the school and supports concrete as well as abstract learning.

10b. An audit is used by the Maths coordinator to ascertain the amount and quality of resources being used in lessons and makes purchases as a result if necessary. It is the responsibility of all staff to maintain resources and report any purchases that need to be made as a result of broken/damaged items to the coordinator.

10c. Every class has the access to a Maths Box. This resource allows staff to address key areas of the Mathematics curriculum with children who may require additional support to develop their understanding.

10d. Maths dictionaries are made available in each classroom and children are encouraged to use them actively to develop their understanding of key technical vocabulary.

11. Evaluation and monitoring

11a. Mathematics will be monitored regularly throughout the school by:

- Pupil interviews
- Book looks
- Lesson observations

- Reviewing and monitoring of planning
- Assessment and analysis of data

Policy written by: R Hyde, Maths co-ordinator

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