

St John Fisher Catholic Primary School

Maths Policy

Introduction

Mathematics is a life skill which is an essential element of communication, widely used in society, both in everyday situations and in the world of work.

This policy outlines the aims, organisation and management for the teaching and learning of mathematics at St. John Fisher Primary School. It is based on the 2014 National Curriculum (NC) and as a school we are working towards a Mastery Style of teaching.

As a school believe that - **‘Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil’s journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that’s been taught to enable him/her move on to more advanced material.’** (NCETM)

Our aims in teaching mathematics are:

- To equip pupils with the mathematics they need to become numerate.
- To develop their ability to apply mathematical skills with confidence and understanding when solving problems.
- To enable pupils to express their ideas and explain their reasoning using the language of mathematics
- To develop positive attitudes to mathematics, recognising that mathematics can be both useful and enjoyable.
- To nurture a fascination and excitement of mathematics through active participation.
- To be able to use and apply the skills in other curricular areas.

Teaching Mathematics

Organisation

- Mathematics is taught daily in Years 1 – 6 for at least 60 minutes.
- The EYFS curriculum is used for children at the foundation stage. These pupils experience mathematics on a daily basis. This early introduction to mathematics will generally be undertaken orally and often in the context of a class theme, e.g. a particular story.
- A short (5-10 minutes) daily lesson of learning, rapid recall and application of arithmetical facts skills is held in all year groups (big maths). These facts are tested on a weekly basis.

Curriculum Planning

Long Term Planning - We follow the White Rose Hub Scheme of Learning Overview for the year. (Appendix 1 for example)

Medium Term Planning - We follow the White Rose Hub Scheme of Learning Termly plan (Appendix 2 for example)

Short Term planning - The St. John Fisher Short Term Plans - Weekly plan (Appendix 3 for example) - is used by staff to plan learning over a series of lessons.

Planning guidance is provided for teachers see appendix 4

Inclusion

The school’s equal opportunities policy applies to the teaching of mathematics as to all other subjects.

Teaching methods and approaches

In order to provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are used:

- Before undertaking independent work children should have the opportunity to solve problems in pairs or groups on white boards or with physical apparatus to encourage their ability to express their reasoning and use precise mathematical language.
- During the lesson children may use physical resources, play games and solve a variety of problems either individually, in pairs or in a small group, depending on the nature of the activity.
- ICT is used where appropriate by teachers and pupils to support teaching and learning in Mathematics.
- A Romero Academy 'Routeway' through calculation has been agreed. The methods taught are exemplified in the attached 'Routeway through calculation' documentation (see appendix 6).

Assessment

Day-to-day assessments

As part of the ongoing teaching and learning process, teachers will assess children's understanding, attainment and progress in mathematics which is used to inform planning for the next lesson and where necessary informal interventions. Such assessment may be based upon observation, questioning, informal testing, feedback marking and evaluation of work - see marking guidance.

Romero Grid Assessments

At the end of each mathematics topic (e.g. decimals) the pupils should be assessed against the appropriate Romero Grid Objectives. The number of objectives a child has met are then translated into a stage e.g. Beginning year 4 (B4), Developing year 4 (D4) and Secure year 4 (S4). Once a child has met more than half the objectives for each stage, and the teacher feels that they are ready, they can be given a plus e.g. D4+. These stages are reported on an at least termly basis to enable the tracking of pupil progress. (See Assessment guidance - appendix 5).

Standardised assessments

Each term during assessment week children will complete a PUMA test. This will enable progress made on Romero objectives to be evaluated in the light of progress made in the standardised test as well as giving an independent indication of where a child sits in relation to national age related expectations.

In addition the school undertakes National Curriculum mathematics tests for pupils in Years 2 and 6 (following National directives).

Teachers also draw upon the above assessment types and supplementary notes and knowledge about their class to produce a summative record to be reported to parents and the child's next teacher.

Intervention programmes

The Numbers Count intervention programme is led by our Numbers Count teacher and takes place with learners predominately in Year 2, 3 and 4 who are below age related expectations. Children receive either one to one sessions or small group sessions for 30 or 40 minutes three or four times a week across a term. These children are then tracked to measure the impact of the intervention.

First Class@ Number 1 and 2 and Success@Arithmetic are TA led intervention programmes currently used with learners in years 2-6 who are at risk of not reaching age related expectations. These children have about 24 sessions in groups of four and are then tracked to measure the impact of the intervention.

There are also less formal interventions, run across different year groups when necessary, where children are not making expected progress. Other interventions will also be supplied as needed.

Maths presentation and marking

Presentation

- Date in numbers in format 16.3.17 in all years and underlined from year 2 upwards.
- Where appropriate* a learning objective should be at top of work for all year groups and should be underlined (from year 2 upwards) in the form of '**I am learning to ...**'. (It is not necessary to underline in pencil if the child is working in pen. The child need only switch to pencil where pen is not appropriate e.g. drawing).

*Sometimes the lesson may be a lesson of discovery and you may not want to give away what the children will find out. However, in that case a clear description of concept being focused on should be somewhere in the work.

- Rulers should be used for lines e.g. underlining / tables but are not necessary for small lines like the line between fractions or the line in a short division sum.
- It is important that children are developing a clear and legible style that can be read and understood and that they are proud of their work. However, presentation is less important than developing mathematical fluency and understanding. It is acceptable to have parts of the work that are not well presented when they are jottings and working out how to solve a problem, bearing in mind that the reader still needs to understand when a questions asks for working to be shown. It may be appropriate to have a section of the book marked off for jottings where no presentation comments are made. Whilst poor presentation need not always be commented on, incorrect number formation, reversal of numbers and incorrect spelling of mathematical vocabulary are all things that should be identified.

Marking

- Work to be marked in green pen (not highlighter), tick for a correct answer, dot for incorrect:
✓ = correct • = incorrect
- VF should be written to indicate verbal feedback where evidence is necessary to show significant feedback.
- If children mark their own work part way through or at the end of a lesson then this should be done in crayon (or pencil if using pen) and then a tick or brief comment from the teacher to show he/she has reviewed the work.
- Positive comment where appropriate in green pen at the end of work.
- Constructive criticism or gap tasks** in green pen at the end of work indicated by pink highlighter
- **Gap tasks can be used to consolidate or extend children's learning where deemed appropriate but are not expected.
 - For example, if there are lots of mistakes in a piece of work focus on picking up the most important / common one and asking the child to correct this through a gap task rather than noting them all. In this way the child makes progress and is not disheartened.

- If you feel that a child's learning can be extended/consolidated by a follow-up question (that will not be covered in the following lesson).

All gap tasks should be marked.

Environment

The school aims to provide a mathematically stimulating environment that supports the teaching and learning of mathematics:

- through the development and use of working walls to support learning and teaching in a lesson or series of lessons.
- through interactive displays that promote mathematical thinking and discussion
- through displays of pupils' work that celebrate achievement
- with key vocabulary linked to the current unit displayed

Mathematics Resources

Each classroom should have a range of resources appropriate to the age of children in the class that are frequently in use e.g. Number lines or Numicon in KS1 and place value counters and place value charts in KS2.

Less frequently used resources for all key stages are stored in a central location, see appendix 7.

There are also a large number of resources for maths including reasoning, big maths and assessment on the T drive in the maths folder.

Homework

We recognise the importance of making links between home and school and encourage parental involvement with the learning of mathematics. Homework provides opportunities for children

- to practise and consolidate their skills and knowledge,
- to develop and extend their techniques and strategies, and
- to share their mathematical work with their family
- to prepare for their future learning.

Maths homework is set every week and generally links to the learning that week.

There is also the expectation that children will spend time at home learning and practising arithmetical facts such as their Big Maths facts and multiplication facts.

Signed:

Date: March 2017

Principal

This policy will be reviewed in July 2018.

Appendix 1

Year 4 Overview												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition and Subtraction			Number: Multiplication and Division			Measurement: Area		
Spring	Number: Fractions				Measurement: Time	Number: Decimals				Measurement: Money		
Summer	Measurement: Perimeter and length	Geometry: Angles	Geometry: Shape and symmetry		Geometry: Position and direction		Statistics		Measurement: Area and perimeter			

Appendix 2

Term by Term Objectives											Year 4	
Year Group	Y4			Term			Autumn					
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
<p>Number – place value</p> <p>Count in multiples of 6, 7, 9, 25 and 1000.</p> <p>Find 1000 more or less than a given number.</p> <p>Count backwards through zero to include negative numbers.</p> <p>Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones)</p> <p>Order and compare numbers beyond 1000.</p> <p>Identify, represent and estimate numbers using different representations.</p> <p>Round any number to the nearest 10, 100 or 1000.</p> <p>Solve number and practical problems that involve all of the above and with increasingly large positive numbers.</p> <p>Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.</p>			<p>Number- addition and subtraction</p> <p>Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.</p> <p>Estimate and use inverse operations to check answers to a calculation.</p> <p>Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.</p>			<p>Number – multiplication and division</p> <p>Recall and use multiplication and division facts for multiplication tables up to 12 x 12.</p> <p>Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.</p> <p>Recognise and use factor pairs and commutativity in mental calculations.</p> <p>Multiply two digit and three digit numbers by a one digit number using formal written layout.</p> <p>Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p>			<p>Measurement- Area</p> <p>Find the area of rectilinear shapes by counting squares.</p>			

Appendix 3

SJF Maths weekly plan		
Mon 10/10/16	I am learning to	Evaluation
Mental /Oral (Fluency practice)		
Introduction of concept		
Stem sentence		
Practise		
Reason/ Apply/Problem solve / Challenge		
Review		

Appendix 4 - Planning Guidance for a unit of work (e.g. Fractions)

Begin by looking at National Curriculum Objectives detailed in the White Rose Hub scheme of learning. Look at the order of the objectives - do they follow in a coherent order if not change them around (Maths No Problem books may help you think about a coherent order).

Look at the appropriate Romero Grid objectives, not only for your year group but for earlier year groups. Make sure that in your teaching you ensure that the relevant preceding years related objectives are understood before moving on. (See *1 and *2)

Planning for each objective.

- Consider what the most important thing that the children need to understand about the concept. This will probably become your stem sentence for this lesson.
- Consider the difficult points of the concept and plan to explicitly address those points
- Consider the pre-knowledge needed for the concept and plan to recap that at the beginning of the lesson so that children who understand it see the links and children who do yet understand it have access to it. It may be necessary for some children to have pre-lesson intervention to understand the pre-knowledge*1
- Consider what other links you can make to topics already taught to ensure that children's knowledge becomes an inter-connected block of knowledge rather than separate topics.
- Consider what apparatus, models, visual images you can use to illustrate the concept. Try to use a variety of these in a lesson or over a set of lessons (conceptual variation) so the children can see the concept from different viewpoints. You may also decide to use counter-examples so the children can see a range of what the concept is and what it is not.
- Then plan your steps of introducing the concept making sure that it is interactive for the children with examples on whiteboards or with apparatus for them to complete as they develop their understanding of the topic. This is likely to be through a PowerPoint or flipchart to enable the children to see the models and images.
- Then plan the independent work the children need to complete during the lesson.
- Over the course of any concept children should have chance to practise the concept as well as reason and problem solve with the concept. These may all be done in the same lesson or over a few lessons.
- When the children are practising the concept there is no need for long repetitive practise of similar questions. If the children can answer 6 or 8 similar questions there is no need to give them 20 of the same type. This time could be spent on reasoning or problem solving with the concept.
- For each concept plan small steps, focusing only on one key element each lesson so that the lessons build one upon another in a clear and coherent way.

Differentiation

Think carefully about differentiation. What support will those who might struggle with the concept need? What challenge will those who rapidly grasp the concept need? Do you actually need separate levels of differentiation?

- If not then don't create them, all children can be working on the same work but you may support some by extra adult support and create extra challenge for the rapid graspers of the concept. This will always be the case if you are tackling a new topic that the children have not met before (e.g. area or decimals in year 4).

- If so then allow pupil choice of differentiated activity to 2 or possibly 3 levels of differentiation (e.g. Hot, hotter, hottest) so you are not limiting the access of children to what they are able to achieve - often you will be surprised by what they can achieve especially if they have chosen that level of challenge.
 - Note that you may have to differentiate not by levels of understanding of the concept but by arithmetical knowledge (e.g. a child may understand column multiplication but have limited tables knowledge).
 - If you have decided to differentiate ensure the sheets are as similar as possible and that all children get to access reasoning questions.

Planning for the future

Any powerpoints, sheets and resources you have created put on the T-drive in a folder named resources next to your weekly plan. In this way as a school we can create resources for the following year that can be tweaked and used again either by you or by new teachers for the year. If we all do this then whether you stay in the same year group or move then you will have something to start with.

Appendix 5 - Ongoing Romero Teacher Grid Assessment guidance

The aim is for each child to be working on the grid from their year group. Where this is not the case you should be aiming for accelerated progress. Therefore you should be working on the grid the child is currently on and also the next year group grid.

For example, a child in year 4 should be on a lilac grid. However, if a child is working on a year 3 grid then have both year 3 and year 4 grids available and aim to teach them the related objectives from each grid in the hope that both grids can be highlighted after the assessment at the end of a topic. If a year 4 child is working on a year 2 grid then have a year 2 and year 3 available to highlight and ensure that the teaching also covers those related concepts. (*2 see planning)

If a child has gaps in understanding demonstrated on the grids where that topic has already been covered in the year then the teacher needs to consider ways to fill those gaps in understanding. This may be through teacher or teaching assistant intervention groups. It may be through covering those topics in the fluency starter for a number of lessons.

To highlight an objective off a grid then the child needs to understand that concept independently of the initial teaching. Therefore they need to either demonstrate that they understand the concept through applying it in a test or in problem solving in a different context away from the lesson in which that concept was taught (e.g applying fractions in a money topic without re-teaching the fractions). For example, testing the children on Romero objectives from a topic about a week after they have finished the topic on will demonstrate whether they have sustained the learning.

Appendix 6 - Romero Routeway through calculation

Appendix 7 - Resources

All class rooms have their own resources for regular use. In addition there are cupboards of resources for all ages in the KS1 corridor and one cupboard in KS2. Written maths resources for KS1 are stored in the

KS1 corridor cupboard. Written maths resources for KS2 are stored in the cupboard near the key stage two staffroom.