



## Greenslade Primary School Maths Policy

### **Introduction**

This document is a statement of the aims, principles and strategies for the teaching and learning of Mathematics at Greenslade Primary School. This document provides information and guidance for teachers, governors and other interested persons and should be read in conjunction with the school's **Calculation Policy**, **Times Tables Policy** and the **Teaching and Learning Policy**. The policy was reviewed and agreed in Autumn 2018 in consultation with teaching staff.

At Greenslade Primary School, we believe that the teaching of Mathematics is integral to the development of children's thinking skills, including problem solving, reasoning, evaluating and making connections. We appreciate that children learn best in contexts that are meaningful and relevant to their lives. Being numerate and confident in Maths is also essential in everyday life and therefore we work hard to promote a positive and enthusiastic atmosphere in our lessons where all children can feel a sense of success and achievement.

### **Aims**

- ✓ To develop positive attitudes towards Mathematics so pupils are confident and competent in their ability to apply maths in different contexts.
- ✓ To allow pupils to become fluent in the fundamentals of Mathematics and to develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- ✓ To develop pupil's ability to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, developing arguments and justifying using mathematical language.
- ✓ To develop pupil's ability to solve problems by applying their Mathematics .
- ✓ To develop pupil's ability to work both independently and collaboratively to solve problems.
- ✓ To plan opportunities for all children to develop their speaking and listening skills in a range of mathematical contexts, allowing them to describe, illustrate, interpret, predict and explain.
- ✓ To enable pupils to develop the correct mathematical vocabulary necessary for them to express their thinking and strategies in an appropriate way.
- ✓ To ensure that there is continuity and progression in Maths throughout the school in line with the guidance from the Early Years Foundation Stage and the National Curriculum.

### **Objectives**

- ✓ To provide a relevant, challenging and enjoyable curriculum and learning experiences for all pupils.
- ✓ To foster an enjoyment of Mathematics as a fascinating and creative subject in its own right, and an understanding of its importance in everyday life.
- ✓ To develop thinking skills such as creativity, problem solving, reasoning and enquiry.

- ✓ To encourage children to work systematically and to appreciate the importance of accuracy and meaning.
- ✓ To develop mental imagery
- ✓ To value the contribution made to the world by mathematicians from all genders and from all cultures.
- ✓ To develop skills in the correct use of equipment.
- ✓ To provide opportunities for reinforcement and consolidation of concepts and skills.
- ✓ To provide opportunities for pupils to use ICT equipment within maths lessons as appropriate in the development of maths concepts.
- ✓ To identify maths in other curriculum areas and make appropriate links.
- ✓ To involve parents as much as possible in their children's mathematical learning.

## **Principles for the Teaching and Learning of Mathematics**

The National Curriculum (2014) describes in detail what pupils must learn in each year group. Combined with our Calculations Policy and Times Tables Policy, this ensures progression and high expectations for attainment in Mathematics.

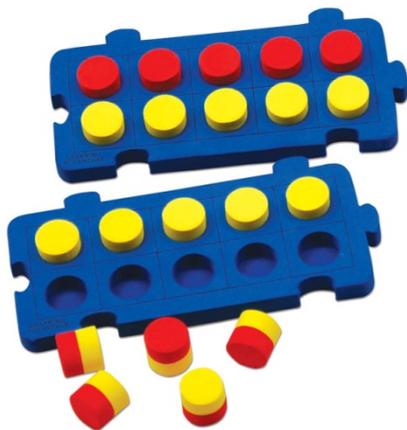
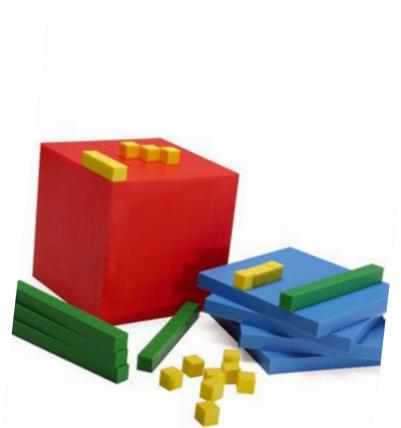
Teachers use a combination of the Rising Stars and White Rose schemes of work as the basis of their medium term and weekly planning. Teachers are also expected to refer to other key documentation to support planning, progression and assessment in Maths such as the NCETM exemplification and 'Progression in Reasoning' document and the Teaching for Mastery document (Oxford Owl). As far as possible, we plan and set work in meaningful contexts, giving the maths we teach a real purpose. Our planning is flexible and can be adapted to fit in with cross-curricular work, special occasions and celebrations, ensuring that the children experience Maths as a vital and vibrant subject, which is an essential part of their world. Teachers should plan for Maths lessons using the daily or weekly mathematics planning sheets (which can be found on the central server).

Children are taught in Year group classes – usually in mixed ability groups as we believe that all pupils have the potential to achieve high in Maths and that every pupil will have different strengths in different areas in Maths. Groupings in Maths lessons are flexible and pupils may work in different groups depending on their need.

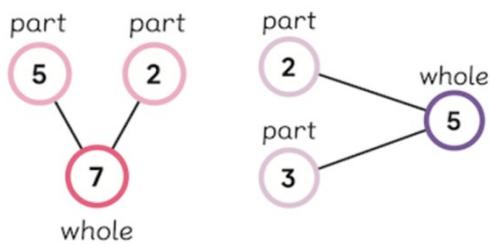
The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by providing challenges that develop depth of knowledge (see appendix for ideas). We believe that **all** children should have access to the greatest level of challenge should they wish to try. We try to avoid 'capping' children of their potential by allocating only the highest level of challenge to the perceived 'higher ability' group. We also try to avoid accelerating children onto 'higher' content as this can sometimes achieve superficial understanding of a concept. Instead, we try to provide layers of challenge in our lessons which all children have access to. Children who grasp concepts more rapidly are challenged through more demanding problems which deepen their knowledge further. Differentiation is also achieved through provision of extra support for those children who need longer to grasp concepts and through provision of physical resources.

Lessons should be well structured, lively and be delivered at a good pace. Where possible, lessons should embed mathematical understanding through concrete, pictorial and abstract representation (CPA). Children can find Maths difficult because it is abstract. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way.

The '**concrete stage**' is the 'doing' stage. In this stage, pupils use concrete objects to model problems. During this stage, concepts are brought to life by allowing children to handle and experience physical objects. Children should be encouraged to use concrete materials to support their learning, regardless of their age.

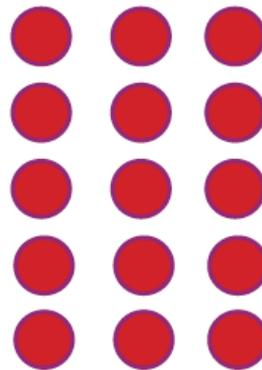
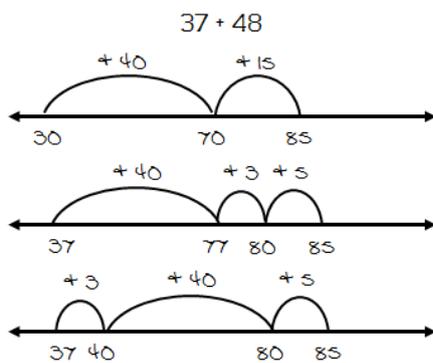


The **'pictorial stage'** is the 'seeing' stage. Here, visual representations of concrete objects are used to model problems. In this stage, children are encouraged to make a mental connection between the objects they have just encountered and the abstract pictures, diagrams, or models that represent the objects from the problem. Children should be encouraged to demonstrate their understanding of mathematical concepts using a range of representations.



3	?
7	

$$7 - 3 = ?$$



The **'abstract stage'** is where children use abstract symbols to model problems. In this stage numbers and mathematical symbols are introduced. It is important that children have a solid understanding of a concept at the concrete and pictorial stage before being moved onto the abstract stage.

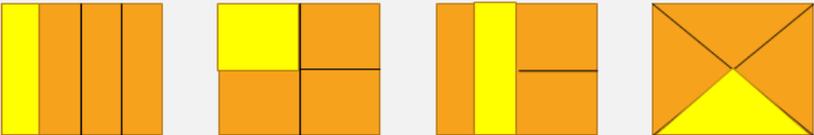
### Variation (Intelligent Practise)

Teachers are encouraged to identify opportunities within lessons in which they could include **conceptual and procedural variation** (intelligent practice) in order to expose children to the essential features of Maths concepts.

In **conceptual variation**, children are exposed to multiple representations of a mathematical concept and are asked to identify what is the same and what is different. In this way, children are exposed to what are and aren't the essential features of the concept being learnt.

For example, children may be exposed to multiple representations of what **IS** the concept and may be asked to identify and explain **what's the same** and **what's different**. In this example, the essential feature identified is that one quarter of the whole shape is shaded.

#### Example 1



'The whole is divided into 4 equal parts. Each part is  $\frac{1}{4}$ ,' 

In conceptual variation, children may also be exposed to multiple representations of what **IS NOT** the concept and may be asked to identify and explain why they do not represent the concept being taught. In this example, children are being exposed to the essential features of what does and does not constitute  $\frac{1}{5}$  of a shape.

#### Example 2

The shaded part is  $\frac{1}{5}$ . True or False?



What is the concept? What is not the concept?

The variation is purposeful  
It focusses on what's important

**Procedural variation** involves teaching a mathematical process in such a way that the process is gradually 'unfolded' through a succession of carefully chosen steps so as to gradually enable the child to determine 'what stays the same', and 'what changes' in each successive step. This enables the pupils to identify the variant and invariant features of the process and to see connections and patterns between steps.

Set A

$120 - 90$

$235 - 180$

$502 - 367$

$122 - 92$

$119 - 89$

$237 - 182$

Set B

$120 - 90$

$122 - 92$

$119 - 89$

$235 - 180$

$237 - 182$

$502 - 367$

*Set B encourages children to identify relationships and make connections between each different calculation.*

$2 \times 3 =$

$2 \times 30 =$

$2 \times 300 =$

$20 \times 3 =$

$200 \times 3 =$

$6 \times 7 =$

$6 \times 70 =$

$6 \times 700 =$

$60 \times 7 =$

$600 \times 7 =$

$9 \times 8 =$

$9 \times 80 =$

$9 \times 800 =$

$90 \times 8 =$

$900 \times 8 =$

*These calculations have been carefully designed in order for children to identify and explain relationships between them.*

What's the same, what's different?

$$253 + 4 =$$

H	T	1s
2	5	3
		4
2	5	7



H	T	1s



What's stayed the same,  
what's changed?



What's stayed the same,  
what's changed?

*These examples have been carefully designed to include small changes to the procedure. This encourages children to identify what has stayed the same, what has changed and why.*

What's the same, what's different?

$$253 + 40 =$$

H	T	1s
2	5	3
	4	0
2	9	3



H	T	1s



What's stayed the same,  
what's changed?



What's stayed the same,  
what's changed?

## **Marking and Assessment**

Teachers should aim to provide quality feedback marking to children once a week. Teachers should mark in green pen, using a tick to indicate a correct answer. A dot should be used to indicate an incorrect answer and where the child needs to go back and check the answer. Teachers may provide prompts to help a child arrive at the correct answer such as re-modelling steps along a number-line, modelling how to set out a calculation etc. Where a child has demonstrated accuracy in their work, the teacher should provide a moving on comment, question or challenge which encourages the child to apply their knowledge at a deeper level (ideas in appendix). Children should be given the opportunity to respond to written feedback and should respond in purple pen.

Assessment is ongoing and is based on the objectives for the lesson. At Greenslade, we see assessment as central to the teaching and learning process, enabling us to plan work appropriately to match the needs of the children. We do this as much as possible through direct observations, discussion, carefully targeted questioning, marking, and testing. These assessments directly inform planning.

Teachers make use of the Maths Assessment Grids to assess children and to identify gaps. Teachers submit a teacher assessment of each child on a termly basis. Parents are informed of their child's progress and targets through academic review days. Data for each class is analysed by senior leaders and discussed with teachers during termly pupil progress meetings. At these meetings, we check that children are making at least expected progress and where they are not, we discuss how they can be further supported through additional intervention.

To assist their judgements, teachers may use commercially produced progress tests to review the progress the children have made in relation to the key objectives for their year group.

All parents receive an annual written report in which there is a summary of their child's efforts and progress throughout the year. At the end of the Foundation Stage, the Early Learning Goals are used as a basis for checking pupil's attainment. At the end of Key Stage 1 and 2 each child's level of achievement against national standards is included as part of their annual written report.

## **Homework and Parental Involvement**

Children may be given homework related to Maths. Activities may include number games and puzzles, the learning of number facts (e.g. times tables) or activities that make use of the home context or that require children to collect data or take measurements.

Parents and carers are encouraged to support their children's learning in Maths in a variety of ways. These include working with their child at home on the activities set by the class teacher. Academic review days provide an opportunity for teachers to share in more detail how parents can further support their child at home.

## **Inclusion**

All pupils are included in the daily Maths lessons and experience direct, interactive and lively teaching appropriate to their age.

We believe that every child has an entitlement to a broad, balanced, meaningful and relevant Maths curriculum. We recognise that each child is unique in terms of characteristics, interest, abilities, motivation and learning needs. At Greenslade, we recognise children's different learning styles and preferences and aim to provide contexts for visual, auditory and kinaesthetic learners. Those children with exceptional learning needs have equal access to high-quality and appropriate Maths education. Where necessary, teachers, with the help of the Senco, will draw up an Individual Education Plan for a child.

The progress children make in their mathematical knowledge, understanding and skills is monitored by analysing performance data throughout the school to ensure that there is no disparity between groups of children regardless of gender, race, cultural background or disability.

## **Management of the subject**

Our Maths coordinator will:

- ✓ Seek to enthuse pupils and staff about Maths and promote high achievement.
- ✓ Advise and support staff in the planning, delivery and assessment of Maths.
- ✓ Manage and develop all Maths resources.
- ✓ Monitor and evaluate Maths throughout the school (including lesson observations, work scrutiny and data analysis).
- ✓ Monitor the Maths curriculum and update the school's policy and schemes of work in accordance with national guidelines and curriculum statements.
- ✓ Attend courses and meetings and disseminate information to staff through INSET and informal conferencing.
- ✓ Ensure continuity and progression from year group to year group.
- ✓ Advise in-service training to staff.
- ✓ Advise and support staff on the implementation and assessment of Maths throughout the school.
- ✓ Work with support staff to ensure their skills and knowledge are kept up to date.

## **How the subject is monitored and evaluated**

Maths lessons are monitored by the Head teacher and the Maths coordinator. The Maths coordinator collects Maths planning and gives appropriate feedback. Maths books are also monitored by the Maths coordinator to ensure coverage, progression and progress. Again, appropriate feedback is given through written and verbal feedback. As a result of these monitoring and evaluation procedures, individual teachers and whole school needs are identified and provision may be made to enable teachers to observe colleagues' lessons or to observe leading Maths teachers. Relevant Maths INSET is planned to match teachers' needs and is in line with the School Development plan and National developments.

## **The role of governors**

We have one named governor who assumes responsibility for the curriculum in the school by meeting regularly with the Head teacher and taking an overview of provision and standards in mathematics.

## **Organisation of resources**

A basic range of maths equipment is provided in each classroom to ensure continuity of experience as children progress through the school. These resources can be supplemented according to need from the central maths room. Classroom resources should be well organised, labelled and should be easily accessible. Children should be encouraged to independently equipment to support their learning.

## **Success Criteria**

This policy will support teachers in the delivery of the objectives from the National Curriculum for Maths and the Early Years Foundation Stage Framework. It will enable our school to meet our aims and objectives and to ensure that we foster an understanding and enjoyment of mathematics. It will be reviewed on a two yearly cycle.

Reviewed and updated: Autumn term 2018

Review date: Summer term 2021

Appendix 1 Examples of strategies for developing challenge through depth

*Is he/she right? Why?*  
*X says... right? Why?*

Can you create your own?

Missing box questions (boxes in various places)

*Can you write a rule for...?*

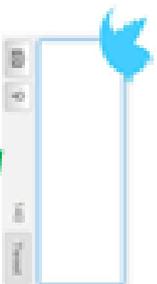
Describe what you noticed



Can you ... In two/three *different* ways? True or false? Explain how you know

Which is the odd one out? Why?

**Strategies to promote challenge through depth/reasoning and problem solving**



Text/tweet tips for...

Can you spot the mistake?



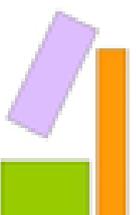
Is it always, sometimes or never true that...? Prove it

What's the same, what's different?

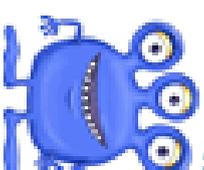
Application through word problems/contextual problems

What's the same, what's different?

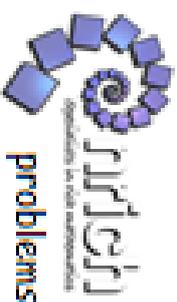
*\* Here one is blue by four rectangles, a three by 2 one rectangle, and a two by four rectangle. What's the same? What's different?*



Explain to an alien how to ...



Put these in order from...



Do you agree or disagree? Explain why



Explain how ... helps you when you are ...



# Greenslade Maths Policy

Autumn 2018