**Maths Policy**

**R.Horton**

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Approved by Chair\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Review Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Introduction

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is 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.

The National Curriculum for Mathematics describes what pupils must learn in each year group. Combined with the Calculation Policy, this ensures continuity and progression and high expectations for attainment in Mathematics. It is vital that a positive attitude towards Mathematics is encouraged amongst all of our pupils in order to foster confidence and achievement in a skill that is essential in our society.

At Lodge Farm we use the National Curriculum for Mathematics (2014) as the basis of our Mathematics programme. We are committed to ensuring that all pupils achieve mastery in the key concepts of Mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education.

# Aims

The teaching of Mathematics aims to ensure that all pupils:

 become **fluent** in the fundamentals of Mathematics, including through varied and

frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

 **reason mathematically** by following a line of enquiry, conjecturing relationships

and generalisations, and developing an argument, justification or proof using mathematical language.

 can **solve problems** by applying their Mathematics to a variety of routine and

non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an inter-connected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils’ understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

# Theories for the Teaching of Mathematics

At Lodge Farm we follow White Rose Hub with additional planning as required.

* **Jerome Bruner**

Bruner studied how children learn and put forward the Concrete Pictorial Abstract (CPA) approach to learning. Initially a concept is enacted with “concrete” materials, later it is represented by models (pictures) and then by abstract notation (such a plus or equals sign). These learning theories are the basis of the Concrete Pictorial Abstract approach which runs throughout the Maths - No Problem Programme. Bruner also proposed the spiral curriculum: a teaching approach in which each subject or skill area is revisited in intervals at a more sophisticated level each time. Using this technique of a spiral curriculum, material in the Maths - No Problem Programme is presented in a logical sequence.

* **Richard Skemp**

Skemp wrote about instrumental and relational learning. Skemp distinguishes between the ability to perform a procedure (instrumental) and the ability to explain the procedure (relational) and argues that these are two different methods of learning - relational and instrumental. Maths - No Problem aims for pupils to progress beyond seeing mathematics as a set of arbitrary rules or procedures so that they have a relational understanding.

* **Zoltan Dienes**

The idea is that you vary the lesson through a series of examples that deal with the same problem or topic. Variation can take the form of mathematical variability, where the learning of one particular mathematical concept is varied, and perceptual variability, where the concept is the same but the pupils are presented with different ways to perceive a problem and use different ways to represent the same concept. The Maths - No Problem approach presents this in a systematic way to ensure pupils comprehend what they are learning.

# Broad Guidelines

* All work relevant to KS1 and KS2 is planned from the National Curriculum and Foundation Stage Framework for Reception pupils.
* Years 1to 6 will base the delivery of Maths teaching on White Rose Hub.
* An outline of what should be covered by each year group is outlined in the long-term planning.
* The mathematical areas covered are: Number, Geometry, Measure and Statistics.

In order to ensure appropriate experiences for all pupils, staff are provided with a range of resources for use throughout school, including teacher resources and computer software.

# Lesson Structure

* Mathematics is taught in year groups
* Mathematics is taught daily and for approximately 5 hours per week at KS1 and KS2.
* Times tables practise takes place daily alongside mental arithmetic practise.
* The predominant method of working in Mathematics is a combination of whole class teaching and learning, group work, paired work and individual work.

Most Mathematics lessons will follow the four/ five part lesson format:

* **Mental Arithmetic** – This can be a focused session and then a focus though “Flashback 4”

where past learning is practised through a series of questions.

* **Introducing** a concept to the pupils through a modelled task.
	+ This is an opportunity for pupils to work on a new concept.
	+ It allows pupils to surface what they know and the teacher to extend their understanding.
	+ It should be supported with the use of concrete materials.
* **Developing** the concept through **‘Guided Practice’.**
	+ This is an opportunity for pupils to work under the guidance of the teacher.
	+ It is characterised by discussion, not always recording through writing.
	+ The teacher should further pupils’ understanding and support pupils who are struggling.
* **Consolidating** the concept through ‘**Independent Practice**’. This will be segmented into 3 sections of varied fluency (VF1, VF2 and VF3).
* **Reasoning and Problem solving** – all children should be given time at the end of the lesson to apply their learning through a reasoning and a problem solving activity.

Throughout all lessons, the teacher should use skilled questioning to the whole class, groups and individuals in order to support and extend learning.

# Recording of Work

Much of the work undertaken by pupils will take place practically and verbally however there will be evidence recorded for every lesson. This will usually be in the form of written work in Maths exercise books. When written work does not take place, teachers will need to record evidence through other means such as:

* Recording group work or discussions on iPads and using QR readers
* Using photographs to capture evidence of practical tasks

# Planning

## Long-term Planning

Mathematics is a core subject in the National Curriculum. In Years 1 – 6, we follow White Rose Hub so our long-term planning is matched to this. In Reception, planning is based on the Early Years Foundation Stage Framework and supplemented with White Rose hub EYFS resources.

## Medium Term Planning

Medium term planning is matched to White Rose Hub. Each class teacher has a copy of their year group’s outline and can modify it as appropriate to the learning needs of their class.

## Short Term Planning

Daily lesson plans are available to class teachers on the White Rose Hub resource website. It includes:

* The lesson objective
* The National Curriculum link
* The lesson approach (details on what the teacher key understanding the teacher should deliver)
* Assessment opportunities
* Points to consider for questioning and teaching points

Teachers should adapt it as appropriate so that it matches the needs of their individual classes. Planning should be kept in class teachers’ planning and assessment files.

# Marking

Marking follows the school’s marking policy. Teachers should address any misconceptions or consistent errors in their marking to ensure pupils have the opportunity to learn where they have made mistakes and how they could improve or avoid this next time. Next challenge comments may be added to further stretch and challenge pupils with their learning.

# Assessment

The pupils will be assessed by their class teacher every day. This will help the teacher to monitor the pupil’s progress in certain concepts. This is done through observation, questioning and marking.

Teacher assessment grids are used throughout the year. In the teacher’s assessment file, each pupil has a grid which includes a list of objectives that the pupil needs to achieve in order to be secure or working at greater depth within their current year.

The Assessment Calendar details when formal assessment will take place throughout the year. Both past SATS assessments, White Rose Hub end of term assessments and teacher assessments will inform the judgement a teacher makes about a pupil’s level.

Reporting to parents is done on a formal basis three times in an academic year:

* Parents Evenings in the Autumn and Spring terms.
* A written report of a pupil’s progress and achievement in the Summer term.

However, teachers are always available for informal discussions with parents at a mutually convenient time during the school week.

# Times Tables

Times tables are a strong focus at Lodge Farm Primary School. Pupils will be given a regular times tables test and will be rewarded with certificates. Pupils will aim to complete the 2-12 times tables. Once these have been achieved, pupils can aim for their bronze, silver and gold times tables awards. Certificates will be awarded during weekly achievement assemblies. The expectation for when each times table should be learnt is:

* Reception- Count in steps of 2 and 10
* Year 1- 2, 10 times tables, count in multiples of 5 and use all doubles to 10 and corresponding halves
* Year 2- 2, 5, 10 times tables (including division facts), recognising odd and even numbers.
* Year 3- 2, 3, 4, 5, 8, 10 times tables (including division facts)
* Year 4- 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 times table (including division facts)
* Year 5- Apply times table facts in more difficult calculations (e.g. 40 x 6 = 240)
* Year 6- Apply times table facts in more difficult calculations including those which involve decimals (e.g. 0.4 x 6 = 2.4)

All pupils have a TTRockstars login to practise their timetables and to show which times table each pupil is working towards.

See the appendix for times table resources.

# Arithmetic

From Year 1-6, Arithmetic tests should be carried out on a weekly basis and a record of scores is to be kept in the teachers planning and assessment file.

# Resources

Resources are kept in the Maths resource area and can be used at any time. Central resources in Maths are the responsibility of the Maths coordinator who has an annual budget available. Many classes also have class sets of specific resources to support teaching and learning in Maths lessons.

ICT is an additional resource in Maths which can be used for:

* Statistics (use of databases, spreadsheets and graph drawing packages);
* Modelling (logo activities);  Problem solving and investigational activities.

# Inclusion

In planning work the teachers will aim:

* to provide breadth and balance of activities to challenge all pupils including the more able
* to provide a concrete materials to meet the needs of all the pupils including SEN and those with EAL
* to set suitable learning challenges for individuals or small groups of pupils
* to respond to pupils diverse learning needs
* to liaise with the Special Needs Co-ordinator to ensure that provision is made for all pupils
* to ensure interventions are applicable with clear objectives set

# SEND Provision

At Lodge Farm, provisions are in place to support pupils with special educational needs. Pupils may be withdrawn to receive intervention sessions. In class, the class teacher will make sure that the individual needs of each pupil are met. SEND plans will be taken into consideration when planning in order to help the pupil achieve their given targets.

# Equal Opportunities

At Lodge Farm, we are committed to working towards equality of opportunity in all aspects of school life. Our aim is to offer all our pupils a mathematical curriculum that is relevant and differentiated to all pupils’ needs and abilities, so that every pupil may reach their full potential.

**This policy will be reviewed annually.**

# Times Table Resources

**TIMES TABLES REWARD PROGRAMME**

**Aims:**

* To ensure all children know their times tables.
* To raise standards in Mathematics.

|  |
| --- |
| **Programme outline**  |
| 5 x morning times table sessions  | Children practise their tables through chants, song, games, quizzes, speed grids, activity booklets etc.   |
| When necessary by class teacher (and at regular intervals). 5 x 10 minute sessions by support staff  | Assess children using the sheets below. - Children will be expected to answer mixed x and ÷ questions AT SPEED.  |
| When a child has passed. (Evidence from 100% correct on sheet)  | * Send child to Maths Lead for oral test
* SMT to sign and present certificate in assembly
* Certificate and prize given for Bronze, Silver, Gold and Diamond.
 |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 2 =  |
|  | 8 x 2 =  |
|  | 2 x 10 =  |
|  | 16 ÷ 2 =  |
|  | 20 ÷ 2 =  |
|  | 2 x 2 =  |
|  | 5 x 2 =  |
|  | 14 ÷ 2 =  |
|  | 6 x 2 =  |
|  | 9 x 2 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 3 =  |
|  | 8 x 3 =  |
|  | 3 x 4 =  |
|  | 15 ÷ 3 =  |
|  | 21 ÷ 3 =  |
|  | 2 x 3 =  |
|  | 3 x 5 =  |
|  | 27 ÷ 3 =  |
|  | 6 x 3 =  |
|  | 9 x 3 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 4 x 2 =  |
|  | 8 x 4 =  |
|  | 4 x 10 =  |
|  | 16 ÷ 4 =  |
|  | 20 ÷ 2 =  |
|  | 7 x 4 =  |
|  | 5 x 4 =  |
|  | 28 ÷ 4 =  |
|  | 6 x 4 =  |
|  | 9 x 4 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 5 =  |
|  | 8 x 5 =  |
|  | 5 x 10 =  |
|  | 25 ÷ 5 =  |
|  | 20 ÷ 5 =  |
|  | 2 x 5 =  |
|  | 5 x 5 =  |
|  | 10 ÷ 5 =  |
|  | 6 x 5 =  |
|  | 9 x 5 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 6 =  |
|  | 8 x 6 =  |
|  | 6 x 10 =  |
|  | 18 ÷ 6 =  |
|  | 60 ÷ 6 =  |
|  | 6 x 2 =  |
|  | 5 x 6 =  |
|  | 12 ÷ 6 =  |
|  | 6 x 6 =  |
|  | 9 x 6 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 7 =  |
|  | 8 x 7 =  |
|  | 7 x 10 =  |
|  | 21 ÷ 7 =  |
|  | 42 ÷ 7 =  |
|  | 7 x 2 =  |
|  | 5 x 7 =  |
|  | 14 ÷ 7 =  |
|  | 6 x 7 =  |
|  | 9 x 7 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 8 =  |
|  | 8 x 8 =  |
|  | 8 x 10 =  |
|  | 16 ÷ 8 =  |
|  | 32 ÷ 8 =  |
|  | 8 x 2 =  |
|  | 5 x 8 =  |
|  | 72 ÷ 8 =  |
|  | 6 x 8 =  |
|  | 9 x 8 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 9 =  |
|  | 8 x 9 =  |
|  | 9 x 10 =  |
|  | 18 ÷ 9 =  |
|  | 36 ÷ 9 =  |
|  | 2 x 9 =  |
|  | 5 x 9 =  |
|  | 45 ÷ 9 =  |
|  | 6 x 9 =  |
|  | 9 x 9 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 10=  |
|  | 8 x 10 =  |
|  | 10 x 10 =  |
|  | 20 ÷ 10 =  |
|  | 40 ÷ 10 =  |
|  | 2 x 10 =  |
|  | 10 x 5 =  |
|  | 70 ÷ 10 =  |
|  | 6 x 10 =  |
|  | 9 x 10 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 3 x 11 =  |
|  | 8 x 11 =  |
|  | 11 x 10 =  |
|  | 33 ÷ 11 =  |
|  | 66 ÷ 11 =  |
|  | 11 x 2 =  |
|  | 11 x 5 =  |
|  | 99 ÷ 11 =  |
|  | 6 x 11 =  |
|  | 4 x 11 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Times Table

|  |  |  |
| --- | --- | --- |
| **Name:**  |  | **Date:**  |
|  | 2 x 12 =  |
|  | 6 x 12 =  |
|  | 12 x 10 =  |
|  | 48 ÷ 12 =  |
|  | 96 ÷ 12 =  |
|  | 3 x 12 =  |
|  | 12 x 5 =  |
|  | 84 ÷ 12 =  |
|  | 12 x 12 =  |
|  | 9 x 12 =  |

**TIMES TABLE ASSESSMENT SHEET**

# Bronze Assessment Sheet

|  |  |
| --- | --- |
| **Name:**  | **Date:**  |
| 4 × 2 =  | 11 × 10 =  |
| 10 ÷ 10 =  | 4 × 5 =  |
| 7 × 3 =  | 7 × 2 =  |
| 45 ÷ 5 =  | 24 ÷ 3 =  |
| 12 × 10 =  | 11 × 5 =  |
| 36 ÷ 3 =  | 22 ÷ 2 =  |
| 12 × 2 =  | 10 × 3 =  |
| 18 ÷ 2 =  | 7 × 5 =  |
| 12 × 3 =  | 90 ÷ 10 =  |
| 60 ÷ 5 =  | 7 × 10 =  |

**TIMES TABLE ASSESSMENT SHEET**

#  Silver Assessment Sheet

|  |  |
| --- | --- |
| **Name: Date:**  |  |
| 11 × 2 =  |  | 11 × 4 =  |
| 110 ÷ 10 =  |  | 7 × 8 =  |
| 3 × 9 =  |  | 11 × 6 =  |
| 50 ÷ 5 =  |  | 36 ÷ 4 =  |
| 9 × 10 =  |  | 8 × 5 =  |
| 33 ÷ 3 =  |  | 56 ÷ 8 =  |
| 4 × 6 =  |  | 4 × 8 =  |
| 24 ÷ 2 =  |  | 7 × 7 =  |
| 12 × 4 =  |  | 63 ÷ 7 =  |
| 72 ÷ 6 =  |  | 8 × 8 =  |

**TIMES TABLE ASSESSMENT SHEET**

#  Gold Assessment Sheet

|  |  |
| --- | --- |
| **Name:**  | **Date:**  |
| 12 × 2 =  | 6 × 11 =  |
| 120 ÷ 10 =  | 4 × 9 =  |
| 7 × 8 =  | 3 × 6 =  |
| 55 ÷ 5 =  | 84 ÷ 7 =  |
| 12 × 12 =  | 6 × 6 =  |
| 27 ÷ 3 =  | 108 ÷ 9 =  |
| 12 × 7 =  | 9 × 8 =  |
| 48 ÷ 4 =  | 9 × 9 =  |
| 12 × 6 =  | 54 ÷ 6 =  |
| 72 ÷ 8 =  | 96 ÷ 12 =  |

**TIMES TABLE ASSESSMENT SHEET**

#  Diamond Assessment Sheet

**Name: Date:**

|  |  |
| --- | --- |
|  |  |
| 6 × 0.2 =  | 6 × 110 =  |
| 720 ÷ 9 =  | 0.4 × 0.9 =  |
| 0.7 × 8 =  | 300 × 6 =  |
| 50 ÷ 0.5 =  | 450 ÷ 5 =  |
| 120 × 12 =  | 6 × 60 =  |
| 270 ÷ 3 =  | 450 ÷ 9 =  |
| 12 × 0.2 =  | 0.4 × 8 =  |
| 4.8 ÷ 4 =  | 0.9 × 6 =  |
| 0.5 × 6 =  | 540 ÷ 6 =  |
| 72 ÷ 8 =  | 110 x 3 =  |