



SKERTON  
**ST LUKE'S**  
CE VA PRIMARY SCHOOL

## School Christian Values

Generosity, compassion, courage, forgiveness, friendship, respect,  
Thankfulness, trust, perseverance, justice, service and truthfulness.

### Bible Reference

Luke 10: 27 'Love your neighbour as yourself'

## Policy References

This policy is written with reference to the following school policies:

- Calculations Policies for Maths
- Child Protection and Safeguarding
- Curriculum and Teaching and Learning policies
- Marking Policy
- PSHE and SMSC (Spiritual, Moral, Social and Cultural) Policies
- Safeguarding & Child Protection Policy
- Online Safety Policy
- Health and Safety Policy
- SEND Policy and Able Gifted and Talented Policies
- Assessment Policy
- Single Equalities Policy.

Most of these policies are available on the school website. In addition, copies of the following policies are available, on request, from the school office.

# Mathematics Handbook 2020-2021

L Patterson

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# Vision

We want children to develop a healthy, enthusiastic and confident mastery of mathematics.

# Our Curriculum

The key expectations of the Skerton St Luke's curriculum mirror those of the National Curriculum for Mathematics. We strive for children to:

- 1) become fluent in the fundamentals of mathematics so that our pupils develop **conceptual understanding** and the ability to **recall and apply knowledge** rapidly and accurately,
- 2) **reason mathematically** and,
- 3) be able to **solve problems** by applying their mathematics to a range of problems using a variety of methods.

Our curriculum is made up of the following areas

|  |
|--|
| <b>The Number System:</b>                  |
| Place Value                                |
| Addition and Subtraction                   |
| Multiplication and Division                |
| Fractions, decimals, percentages           |
| <b>Measurement:</b>                        |
| Length, height, perimeter, area            |
| Weight, volume, mass, capacity             |
| Money                                      |
| Time                                       |
| Converting units                           |
| <b>Geometry:</b>                           |
| Position and direction                     |
| Shape                                      |
| <b>Statistics:</b>                         |
| <b>Problem solving and investigations:</b> |

# Ofsted

Findings from our most recent report – June 2018.



While appropriate coverage of the curriculum was evidenced, we were asked to improve the quality of teaching by ensuring that:

- teachers gain a better understanding of pupils' learning journey across the school, so that they can build on their starting points and take action to ensure that they reach their end-of-year goals;
- teachers enable pupils to use their mathematical skills to solve problems, including those that require them to reason;
- teachers take greater account of the learning needs of those pupils who have SEN and/or disabilities and build on the progress that these pupils make in the small group teaching sessions.

## National Curriculum

“The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace.”

“Decisions about when to progress should always be based on the security of the 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.”



# Planning

We follow the White Rose and Power Maths schemes of learning for each year group from Reception to Year 5. Years 6 currently use the LPDS Maths planning document.

**Notes and Guidance**  
Children measure to the nearest centimetre using a ruler or tape measure.  
They measure both length and height and focus on the importance of measuring from 0 rather than the end of the ruler or tape measure.

**Mathematical Talk**  
What is the length?  
How can the numbers on the ruler help us?  
How do you know you have drawn a line that is 5cm long?  
How can you check?  
Why is it important to start measuring from 0 on the ruler?

**Varied Fluency**  
Choose a variety of objects and practice measuring them using a centimetre ruler.  
Remember to line up the object to the 0 mark on the ruler.  
e.g. How long is the pencil to the nearest centimetre?  
How tall is the glass?  
What other objects can you find to measure the height of?  
Draw a line that is:  
• 5 cm long  
• 8 cm long  
• Longer than 4 cm but shorter than 6 cm

**Measure Length (cm)**  
**Reasoning and Problem Solving**  
How long is this piece of string?  
How could you find out?  
Does the length change if you change the orientation?  
The length will not change if you change the orientation so it will be easier to measure if you put it in a straight line.  
Mo has used the ruler to measure the length of the car.  
Mo says the car is 8 centimetres long. Do you agree? Explain your answer.  
Mo is incorrect because he has not lined the car up with the 0 marker. If he had measured from 0 he would see that the car is 7 cm long.

## The Four-Part Model

The National Curriculum defines differentiation in Mathematics as follows:

‘Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before acceleration through new content.’

Mastery of Mathematics is our goal for every child, in their own way and at their own pace. We define mastery as:

### ‘Fluency with the unfamiliar’

To move towards fluency with the unfamiliar, pupils work through a four-part model of learning:

## Discover

Opening Minds, Learning Through

This step provides a problem for children to solve using mathematics that they are both familiar with and new learning. This enables children



Representing  
 Support  
 Making sense  
 Modelling



Do

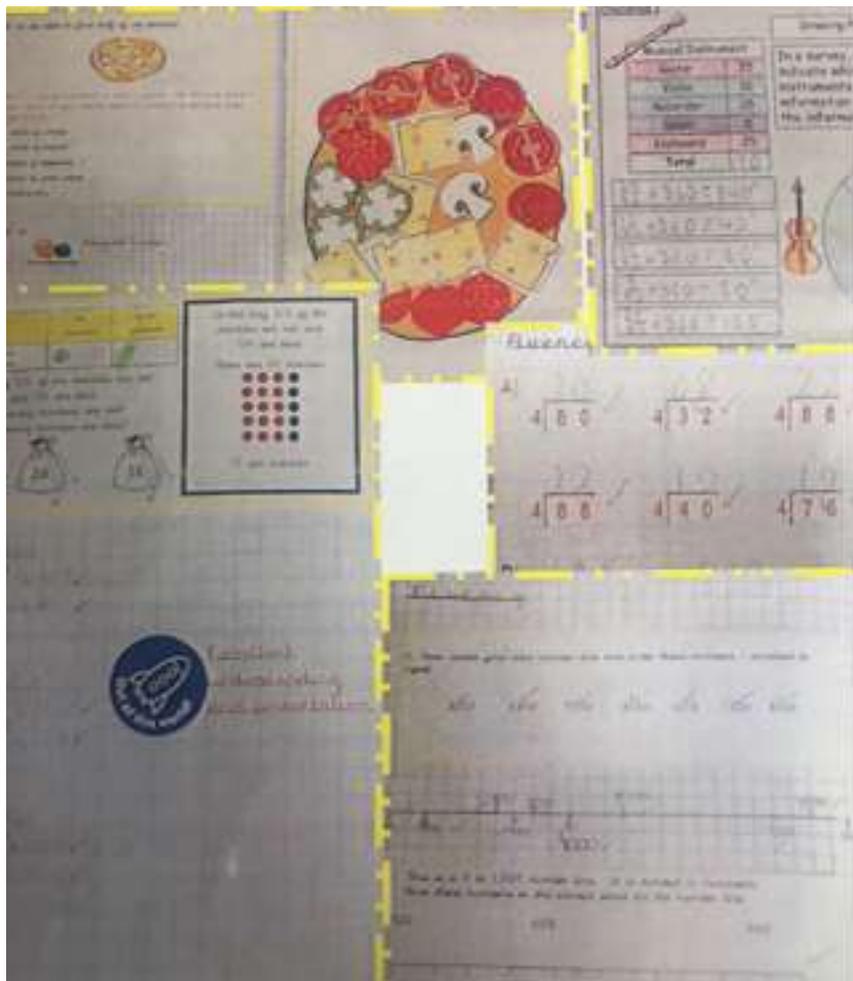
Fluency  
 Generalisation



Children complete a variety of different questions to fully secure their understanding of the learnt concept.

Are they fluent? If so they move to the next part of the model, if not they return to representations.

Whether a child is fluent is left to the teacher's discretion, but children must be able to confidently access the concept in a variety of forms.



# Think

Opening Minds, Learning Thro

Children access this step when the teacher feels they are fluent with the concept being taught. They should be encouraged to refer to the



Applying knowledge  
Extension through  
probing questions

Questions for this part of the model can be found in the AET planning and NCETM documentation which is on the server.



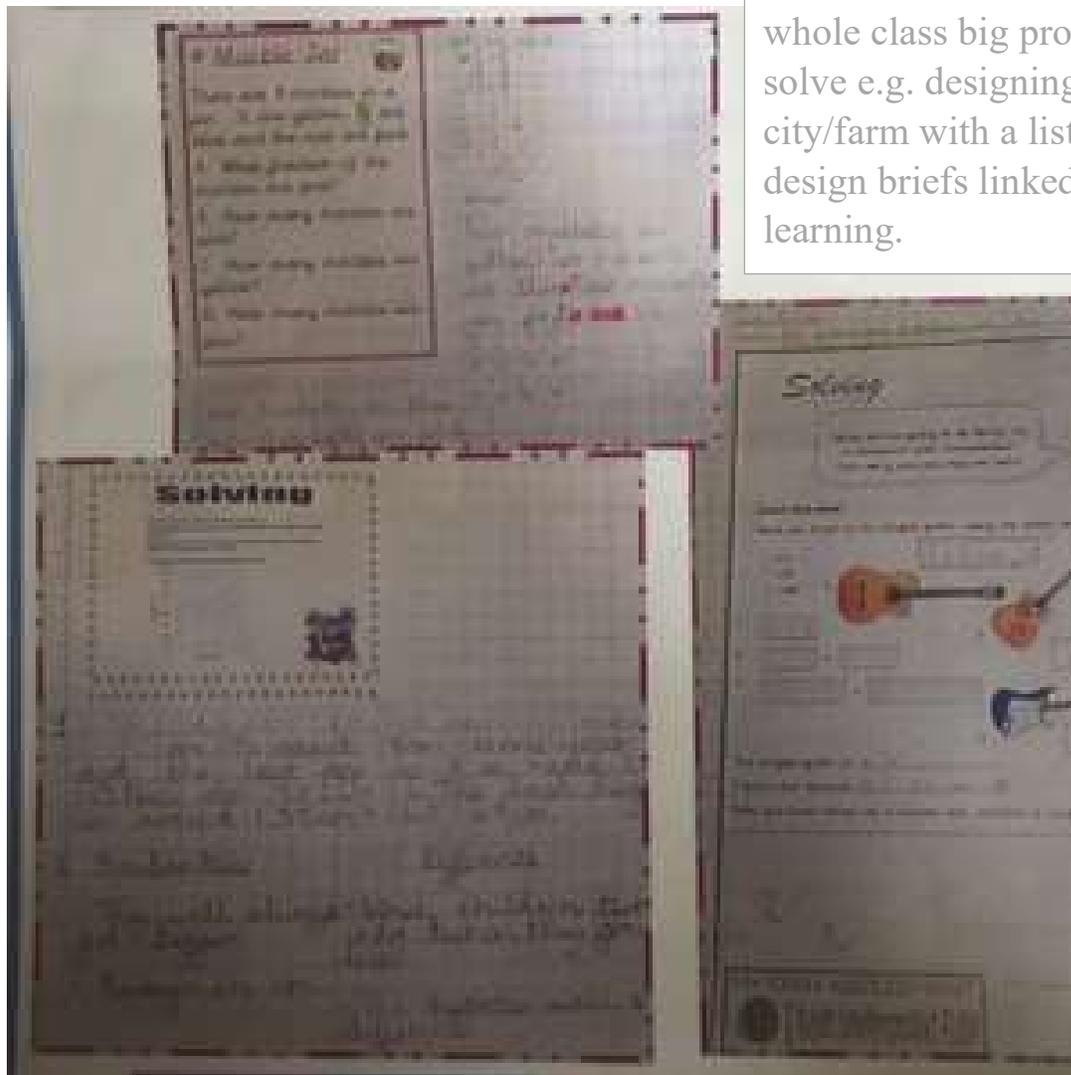
## Challenge



Explaining and reasoning

Solving rich and complex problems

Applying understanding



This section could be a whole class big problem to solve e.g. designing a city/farm with a list of design briefs linked to learning.

# Lessons

Opening Minds, Learning Through Challenge and Celebrating God's World



- Lesson structure to include the 4 step process (though this may be over a sequence of lessons)
- L.O. to be discussed and visible throughout the lesson
- Engaging maths game to begin – Song, Role play, fluency blasts etc
- Make regular reference to key vocabulary
- Always have practical equipment available for children to access either directed by the teacher or independently
- Teaching sequence – Concrete > Pictorial > Abstract
- Have challenges available
- Children of all abilities are offered opportunities to reason
- Effectively differentiated activities – scaffolding in place to support lower ability children
- Assessment for Learning used to move children towards mastery
- Maths lessons should be busy and children should be encouraged to talk about what they are doing:  
Pupil > Teacher, Pupil > Pupil dialogue

## Show me what you know

At the beginning and end of each new unit a ‘Show me what you know’ task is completed and the score is recorded on the Key Objective Sheet.

| Place Value   |   |
|---|---|
|  <b>Mathematics</b><br>    | <b>Show me what you know:</b><br><b>Show me what you know now:</b><br>$+$ $-$ $\times$ $\div$   |
|   |    |
|   |    |
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## Books

- Key objectives sheet at the beginning of every unit



- Show me what you know task completed at the beginning and end of the unit and scores recorded on the KO sheet.
- Clear Learning Objective based on prior learning
- Activities are challenging and engaging, appropriately resourced and linked to real life where possible
- Evidence of children working through the Four Part Model – activities to be colour coded to identify which part
- Opportunities to respond to marking or complete Mini Maths challenge.



## Maths Working Wall

- Key objectives for the unit displayed (from the White Rose planning document)

Opening Minds, Learning Through Challenge and Celebrating God's World



- Vocabulary
- Working wall to be added to at different parts of the unit  
WAGOLLS, teaching examples, challenging questions
- Objects – exemplifying use of equipment
- Pictures – exemplifying pictorial representations
- Strategies modelled for fluency
- Definitions where appropriate
- Shared modelled work – ‘Thinks’ explained and worked through  
– Show Me, Convince Me, Explain
- Colour coded with the same colours as each part of the sequence.
- To be added to throughout the teaching sequence and replaced at the end of the unit – keep in a folder or on washing lines in classroom for children to revisit
- General key information that is useful at any time e.g. number square, times tables square/triangle,  $\diamond$



## Early Years Foundation Stage

Reception staff use the EYFS Framework, Development Matters document alongside White Rose Maths Scheme of learning to plan for



and assess mathematics in the EYFS. Direct teaching and continuous provision are used to develop children's mathematical skills. Practical, hands on activities and application to real life learning opportunities are used to provide children with the fundamental skills required to develop understanding of number, shape, space and measurement. Children in EYFS are exposed to the first 2 parts of the sequence first – Show and Do, moving on to Thinks before they leave Reception in readiness for Year 1

## Supporting children with SEND

We provide a broad and balanced education to all children. Children with SEND are provided with learning opportunities that are matched to their individual needs. Additional intervention packages are also used for any child who may need it.

## Use of ICT

Children use ICT in mathematics lessons where it will enhance their learning, such as modelling their ideas and methods or using learning packages such as Times Tables Rockstars. Wherever possible, we encourage children to use and apply their learning in everyday situations.

A list of useful websites can be found at the back of this handbook.

## Assessment and Recording

Children's mathematical understanding is monitored from entry to school to the end of Year 6 through on-going teacher assessment and statutory testing.

Pre and post unit assessments and Steps to Success documents ensure suitable differentiation and challenge and inform ongoing planning.



Termly White Rose assessments are carried out to inform teacher assessments. Moderation meetings take place both in school and with other schools to ensure consistency of judgements. Pupil's progress and attainment are recorded and used to inform any intervention needs for underperforming children. This information is shared with senior leaders during pupil progress meetings.

End of year assessments assess progress against the national age-related expectations. Transition meetings with staff in each year group at the end of the summer term ensure all staff have a secure understanding of each child's progress in maths and can plan appropriately for their individual needs from September.

## Monitoring and Review

Monitoring of children's work and the quality of teaching in mathematics is the responsibility of the mathematics subject leader. Regular book looks, monitoring of planning and lesson observations ensure evidence of the quality of mathematics teaching is triangulated. Other monitoring activities include, staff questionnaires, pupil conferencing and resource audits.

## Resources

There is a range of resources to support the teaching of mathematics across the school. All classrooms have a selection of appropriate apparatus for everyday use and a variety of teacher resource books. There is also a central store for shared resources.

Annual resource audits are carried out by staff in each class.

As a minimum, children should have access to the following (age appropriate):



| <b>Class</b>         | <b>Key Stage</b> | <b>Central</b>                   |
|----------------------|------------------|----------------------------------|
| Number lines/squares | Set of 2D Shapes | Measuring equipment for mass     |
| Base 10 apparatus    | Set of 3D Shapes | Measuring equipment for capacity |
| Numicon              | Mirrors          | Measuring equipment for time     |
| Cuisenaire           | Dice – various   | Measuring equipment for length   |
| Digit cards          | Calculators      |                                  |
| Place Value cards    |                  |                                  |
| Rulers               |                  |                                  |
| Money                |                  |                                  |
| Pairs of compasses   |                  |                                  |
| Protractors          |                  |                                  |
| Construction kits    |                  |                                  |
| White boards & pens  |                  |                                  |
| Maths Dictionaries   |                  |                                  |

## Useful websites.

<http://www.ictgames.com/saveTheWhale/index.html> BONDS TO 10

<https://www.topmarks.co.uk/maths-games/hit-the-button> BONDS, HALVES, TIMES TABLES

<https://www.topmarks.co.uk/maths-games/mental-maths-train> 4 OPERATIONS TRAIN

<http://ictgames.com/sharkNumbers/mobile/> PLACE VALUE

<http://www.ictgames.com/mobilePage/countingCaterpillar/index.html> NUMBER ORDERING



<https://mathsticks.com/my/> MATHS RESOURCES

<https://www.mathplayground.com/> VARIOUS GAMES

[https://www.mathplayground.com/thinking\\_blocks\\_modeling\\_tool/index.html](https://www.mathplayground.com/thinking_blocks_modeling_tool/index.html) BAR MODELLING

<https://thirdspacelearning.com/> LOAD OF IDEAS FOR MASTERY APPROACH

<https://www.ncetm.org.uk/resources/> NCETM – RESOURCES FOR MASTERY, incl. ASSESSMENT

<https://masterthecurriculum.co.uk/> MATHS RESOURCES MANY FREE - £33 for each year group

<http://www.mathsphere.co.uk/resources/> WORKSHEETS

[http://www.lancsngfl.ac.uk/curriculum/primarymaths/index.php?category\\_id=1151](http://www.lancsngfl.ac.uk/curriculum/primarymaths/index.php?category_id=1151) ICT GAMES

<http://www.numeracyninjas.org/> CHALLENGES – UKS2

<https://myminimaths.co.uk/mini-maths-tasks/> MINI MATHS ACTIVITIES KS2

| <h2>UNIT TITLE HERE</h2>   |   |
|--|---|
|  <div style="text-align: center; font-size: 24px; font-weight: bold; color: yellow; margin: 10px 0;">Mathematics</div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="background-color: red; color: white; padding: 5px; text-align: center; font-size: 8px;"> <b>Show</b><br/>Representing         </div> <div style="background-color: orange; color: black; padding: 5px; text-align: center; font-size: 8px;"> <b>Do</b><br/>Fluency         </div> <div style="background-color: green; color: white; padding: 5px; text-align: center; font-size: 8px;"> <b>Think</b><br/>Probing questions         </div> <div style="background-color: blue; color: white; padding: 5px; text-align: center; font-size: 8px;"> <b>Challenge</b><br/>Rich and complex tasks         </div> </div> | <p style="font-weight: bold; color: green;">Show me what you know:</p> <p style="font-weight: bold; color: green;">Show me what you know now:</p> <p style="font-size: 24px; font-weight: bold; color: green;">+ = x ÷</p>  |
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### Key Vocabulary

## Arithmetic Questions

- Children from Years 1 to 6 complete an arithmetic activity at least once per week
- This will improve their arithmetic fluency to support them in developing mastery of mathematics
- Results are to be recorded on the spreadsheet on the server.

## Mini Maths Activities



- Children are given at least 1 Mini Maths activity per week and are based on objectives
- Mini Maths activities should challenge children to apply their learning
- Answering these questions enables children to demonstrate their understanding.

## Times Tables

- Times Tables must be practiced daily.
- A Times Tables grid must be completed at least once per week.