



St Luke's School

Curriculum Progression Document

Maths

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# Maths Curriculum Intent

## Curriculum Intent

### School Curriculum Intent:

As a values-led school, our curriculum is underpinned by Care, Challenge & Achieve. It is through these values that we develop the whole child. It is our intent that children leave St Luke's ready to move forward in their learning, kind, resilient, filled with a confidence to live well in society and prepared to deal effectively with the challenges that the modern world presents as well equipped digital and global citizens.

### Subject Intent:

It is our intent that children have fluent knowledge and understanding of the number system with the ability to rapidly recall number facts, in addition to performing written and mental calculations efficiently. They will develop factual, conceptual and procedural fluency through a concrete, pictorial and abstract approach. Through a broad range of skills in applying mathematics, they will solve real life problems and reason about mathematical concepts and make connections. Our intent is to give opportunities for children to develop their confidence in using and applying mathematical vocabulary when faced with mathematical challenges.

## Key concepts our children will learn throughout their maths journey at St Luke:

**Know and use numbers** - understanding the number system and how they are used in a wide variety of mathematical ways.

**Add and subtract** - understanding both the concepts and processes of addition and subtraction.

**Multiply and divide** - understanding both the concepts and processes of multiplication and division.

**Use fractions** - understanding the concept of part and whole and ways of calculating using it.

**Understand the properties of shapes** - recognising the names and properties of geometric shapes and angles.

**Describe position, direction and movement** - recognising various types of mathematical movements.

**Use measures** - becoming familiar with a range of measures, devices used for measuring and calculations.

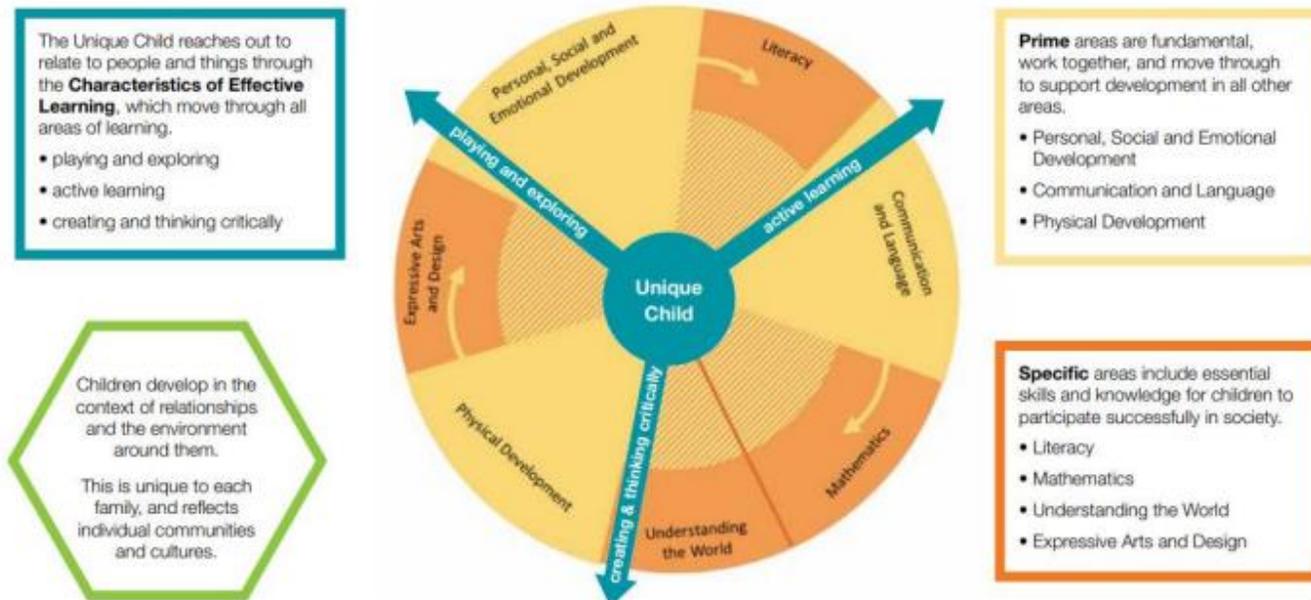
**Use statistics** - interpreting, manipulating and presenting data in various ways.

**Use algebra** - recognising mathematical properties and relationships using symbolic representations.



## Maths in the Early Years Foundation Stage

Developing early Maths skills



Each area of the EYFS curriculum has an Early Learning Goal, which is the standard that a child is expected to achieve by the end of their reception year. The ELG (Early Learning Goals) covers all of the 7 areas of learning as specified in the Early Years Foundation Stage Curriculum.

The following link to the teaching and learning of Maths in our EYFS:

[ELG: Numbers, Shape, Space and Measures.](#)

Children at the expected level of development will:

**ELG II Numbers:** Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

**ELG I2 Shape, space and measures:** Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

# Maths and the Jersey Curriculum



The programmes of study for mathematics are set out year-by-year for Key Stages 1 and 2. The starting point for teaching the programmes of study to a pupil is most likely to be the curriculum for the pupil's current year group. This may vary if pupils have identified Special Educational Needs, or have other significant barriers to learning e.g. non-attendance. Pupils would not usually be expected to progress to the curriculum above their year group.

### **Key Stage 1 – Year 1 & Year 2**

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

### **Lower Key Stage 2 – Year 3 & Year 4**

The principal focus of mathematics learning in Lower Key Stage 2 is for pupils to develop their sense of number to increasingly larger whole number values and develop efficient and accurate methods to perform calculations on them. They are strengthening their appreciation of the numerical operations and place value. Calculators and other technology are used to support solving problems as well as develop conceptual understanding. Pupils should have begun to develop their concept of a number to include rational numbers (fractions expressed either as a quotient or as an extension to decimal notation). Pupils begin to apply mathematical operations to these numbers. Pupils should develop their ability to solve a range of problems, continuing to use concrete manipulatives and measuring tools, pictorial representations as well as numerals, and making connections between measure and number. Pupils should develop their mathematical reasoning so they can gain an awareness of geometrical structure, similar to seeing numerical structure. By the end of Year 4, pupils should be able to recall effectively multiplication facts for whole numbers less than or equal to 12. Pupils should be encouraged to draw with increasing accuracy and read and spell mathematical vocabulary correctly and confidently, using their growing reading knowledge and their knowledge of spelling. Teaching should always highlight the correct mathematical terminology to support this and insist that pupils communicate convincingly and unambiguously.

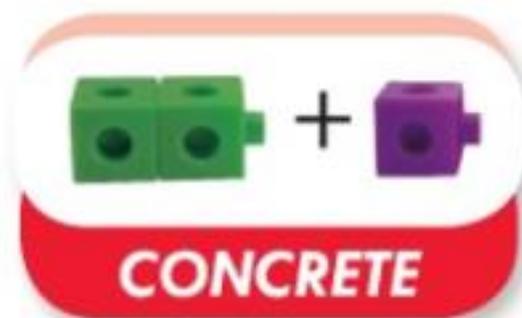
### **Upper Key Stage 2 – Year 5 & Year 6**

The principal focus of mathematics learning in Upper Key Stage 2 is for pupils to develop their sense of number to large integers, while using technology to significantly aid calculation. Pupils routinely verify results using approximation and an extended grasp of the place value system. Pupils develop connections between various numerical representations (different types of fractions, percentages and ratio) and continue to represent these with concrete and pictorial representations where appropriate. At this stage, pupils should develop their ability to reason with a wider range of problems, including increasingly complex properties of numbers. From this foundation in arithmetic (particularly through its pictorial representations), pupils are introduced to the language of algebra as a means for solving a variety of problems. Learning to solve geometry problems with increasingly complex properties consolidates and extends their understanding in number. By the end of Year 6, pupils should be fluent in mental and written methods for all the four operations, when working with (at least two digit) integers, and be able to select the appropriate calculating methods, including the use of technology for a given question. They have an increasing fluency when working with rational

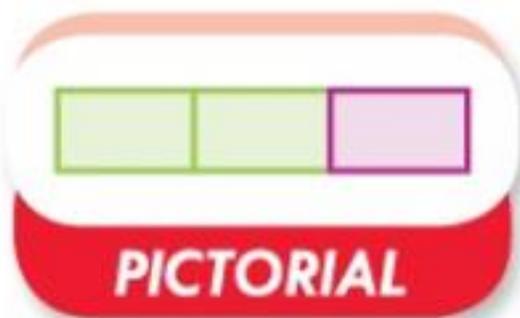
(fractions, decimals percentages) and negative numbers and applying the four rules to them in both 1D and 2D contexts. Pupils use technical vocabulary correctly to communicate their ideas and describe accurately the structure and solutions of their work.

At St Luke's children learn through high quality teaching and learning, supported using the White Rose Maths materials. There is a consistent use of the CPA (concrete, pictorial, abstract) approach, which helps children develop mastery across all the operations in an efficient and reliable way.

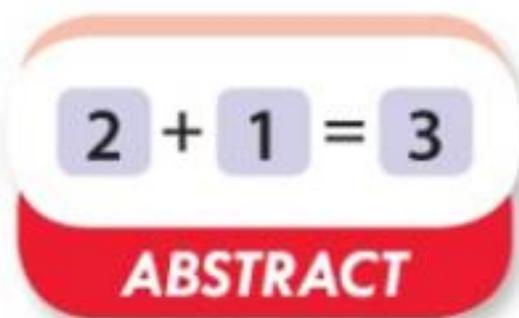
A calculations policy underpins the teaching of the 4 operations (addition, subtraction, multiplication and division) and clearly shows the concrete, pictorial and abstract approaches and progression in each strand of mathematics.



Concrete is the 'doing' stage, using concrete objects to solve problems. It brings concepts to life by allowing children to handle physical objects themselves.



Pictorial is the 'seeing' stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.



Abstract is the 'symbolic' stage, where children are able to use abstract symbols to model and solve maths problems.



Whole School Maths  
Programme of Study



Curriculum Map – Themes / topics			
	<u>Autumn</u>	<u>Spring</u>	<u>Summer</u>
Year 1	Number: Place Value (within 10)	Number: Place Value (within 20)	Number: Multiplication and division
			Number: Fractions
	Number: Addition and Subtraction (within 10)	Number: Addition and Subtraction (within 10)	Geometry: Position and direction
			Number: Place Value (within 100)
		Number: Place Value (within 50)	Measurement: Money
	Geometry: Shape	Measurement: Length and height	Measurement: Time
Consolidation	Measurement: Mass and volume	Consolidation	
Year 2	Number: Place Value	Measurement: Money	Number: Fractions
	Number: Addition and Subtraction	Number: Multiplication and division	Measurement: Time

			Statistics
	Geometry: Shape	Measurement: Length and height	Geometry: Position and direction
		Measurement: Mass, capacity and temperature	Consolidation
Year 3	Number: Place Value	Number: Multiplication and division (B)	Number: Fractions (B)
	Number: Addition and Subtraction	Measurement: Length and perimeter	Measurement: Money
		Number: Fractions (A)	Measurement: Time
	Number: Multiplication and division (A)	Measurement: Mass and capacity	Geometry: Shape
	Statistics		
			Consolidation
Year 4	Number: Place Value	Number: Multiplication and division (B)	Number: Decimals (B)
			Measurement: Money
	Number: Addition and Subtraction	Measurement: Length and perimeter	Measurement: Time
	<u>Autumn</u>	<u>Spring</u>	<u>Summer</u>
	Measurement: Area		Consolidation
	Number: Multiplication and division (A)	Number: Fractions	Geometry: Shape
			Statistics
	Consolidation	Number: Decimals (A)	Geometry: Position and direction
Year 5	Number: Place Value	Number: Multiplication and division (B)	Geometry: Shape
			Geometry: Position and direction
	Number: Addition and Subtraction	Number: Fractions (B)	Number: Decimals
	Number: Multiplication and division (A)	Number: Decimals and percentages	Number: Negative numbers
	Number: Fractions (A)	Measurement: Perimeter and area	Measurement: Converting units
Statistics		Measurement: Volume	
Year 6	Number: Place Value	Number: Ratio	Geometry: Shape
	Number: Addition, Subtraction, multiplication and division	Number: Algebra	
			Number: Decimals
	Number: Fractions (A)	Number: Fractions, decimals and percentages	Themed projects, consolidation and problem solving

	Number: Fractions (B)	Measurement: Area, perimeter and volume	
	Measurement: Converting units	Statistics	





Approaches to Teaching and Learning in Maths.

Teaching and learning will focus on a range of agreed experiences and there will be a focus on:

- A clear progression of knowledge and skills linked to each the essential learning objectives of the subject.
- Teacher modelling, explanation and demonstration (I do, We do, You do approach)

- Children being given the opportunity to develop knowledge through exploration and discussion.
- Fluency is taught explicitly
- Children being encouraged to use visuals and manipulatives to help them to solve calculations and mathematical problems
- Teaching is adapted to meet the needs of different groups of learners

#### Teaching, Recording, Feedback, Assessment and Reporting

##### **This will happen by:**

- Learning Intentions are shared with children each lesson and displayed in children's books.
- Children are given a context through which they can explore each learning intention.
- The various methods of recording should demonstrate the children's understanding of the lesson's learning intention .
- Teachers' feedback should directly relate to the learning intention for the lesson, give specific ways in which the child has been successful.
- Children are given the opportunity to assess their own and others' progress using purple pen. This may be recorded in books or done verbally.
- Regular retrieval practice through flashbacks focus on children knowing and remembering more of what they have been taught previously.
- Teachers should use observations, work recorded by children and data from end of term White Rose assessments to make judgements of the children's current progress against their year group's expectations.
- Assessment information will be used to plan future work for the class, including any intervention necessary.
- This continual assessment will be used to report to parents. Termly reports will contain comments about an individual pupil's progress against the year group expectations.
- All formative and summative assessments made will be used to inform discussions around pupils' progress and attainment in the subject at appropriate times, for example discussions with other professionals and reporting to parents during parent consultation evening etc.
- Children are assessed at the end of each unit to allow teachers to identify gaps and plan for intervention. Summative assessments are completed at the end of each term and recorded on the class data sheet.

#### Reading in Maths.

At St Luke's Primary School, reading is at the heart of the curriculum. It is our intent to ensure that every child not only develops the skills of reading but also a love of reading that will last them a lifetime.

##### Importance of Reading in Maths;

- Helps children to interpret and understand word problems.

- Develops children's understanding and application of mathematical vocabulary and language.
- Supports reasoning and critical thinking skills.

#### SMSC & Rights Respecting in Maths.

##### **What does this look like?**

SMSC and Rights Respecting are not lessons which are taught in isolation, they are interwoven throughout our curriculum. Our staff have a deep understanding of the United Nations Convention on the Rights of the Child (UNCRC) and are able to make links in lessons which are deep and meaningful. We believe that every child has the right to access high quality mathematics education and that they have the right to their own opinion, to ask questions and share ideas.

##### **What impact does this have?**

Due to the fact rights and SMSC development are integrated into our broad and balanced curriculum, children understand the importance of the convention and their SMSC key skills and it becomes a fundamental part of our school ethos. We have found that bringing a rights perspective to areas of the curriculum can enhance and enrich learning and instil a rights respecting ethos within our school. By ensuring that children have a rich SMSC and Rights Respecting understanding, we ensure that they are ready to embrace the challenges of creating a happy and successful adult life.

#### Oracy - Progression of skills:

There is an expectation that key vocabulary is shared with the children on the working wall and where appropriate, on lesson slides. Mathematics lessons should focus on Tier 3 (subject specific) vocabulary and children should be encouraged to use and apply those words.

**Tier 1 - Everyday words:** These will be basic, everyday words which will be used from an early age. These will be used freely in speech, such as:  
*warm, dog, tired, run, table, flower...*

**Tier 2 - Focus words:** These will be common words that are found across subjects. These will need direct teaching, such as:  
*contradict, circumstance, precede, retrospect...*

**Tier 3 - Subject specific words:** These will be rare and will be heard within particular contexts or subject areas. These will need direct teaching, such as:  
*product, scale, equal*

#### Speaking like a Mathematician.

**Speak concisely** (keep it short!) so that you explain complex ideas in a way that is easy for others to understand.

**Structure** your ideas clearly, making sure that you have fully explained your scientific enquiry.

Use expert scientific vocabulary, but make sure that your audience understands it too.  
 Ask probing and clarifying **questions** to challenge others and developing your reasoning.

1. Plans frequent exploratory talk opportunities	2. Uses manipulatives as a tool for talk	3. Connects classroom talk with being a mathematician.	4. Teaches vocabulary explicitly, according to a school-wide progression.	5. Harnesses uncertainty to develop deeper understanding
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The image shows three hand-drawn cards titled "TALK LIKE A ... MATHEMATICIAN".

- Card 1:** Focuses on explaining and proving. It includes sections for "WHAT DID YOU Do AND WHY?", "WHAT DID YOU NOTICE?", "CAN YOU PROVE YOUR FINDINGS?", and "WHAT IF IT GOES WRONG?". It lists various sentence stems like "I noticed that...", "I know this is correct because...", and "I tried the task again and found...".
- Card 2:** Focuses on alternative solutions and peer discussions. It includes sections for "ARE THERE ANY ALTERNATIVE SOLUTIONS?", "DISCUSSIONS WITH PEERS", and "QUESTIONS I CAN ASK MY PARTNER". It lists sentence stems like "I wonder what would happen if...", "I agree with ... because...", and "How did you work out your answer?".
- Card 3:** Focuses on key vocabulary. It includes sections for "ARE THERE ANY ALTERNATIVE SOLUTIONS?", "DISCUSSIONS WITH PEERS", and "QUESTIONS I CAN ASK MY PARTNER". It lists sentence stems like "I wondered what would happen if...", "I agree with ... because...", and "How did you work out your answer?". It also features a "KEY VOCABULARY" box.

Speaking like a Mathematician sentence stems:

- It is the same / different...
  - This reminds me of...
  - I can prove I'm right because
  - We must remember...because
  - There is one more/one less...
- 
- My working out is the same / different than yours because...
  - I can prove I am right because...
  - Another strategy you can use is...
  - I learnt the word...and it means...
- 
- We know that... so... it can't be...

- A major difference between... and... is that...
- I agree because...
- My strategy works because...
- I can check my answers by...
- Next time, I will...

- I think the question means... so the answer means...
- I know that... Therefore, I would try out...
- I approached it methodically by...
- I was systematic... when...
- I looked at the whole problem and broke into these steps...
- So far, I have discovered that...
- The strategy I used was...
- I agree/disagree with...because...
- The solution makes sense because...
- I can visualise this problem by...
- I know my answer is reasonable because...
- The information needed to solve the problem is...
- When I used the inverse, I noticed...