

## Subject Specific Concepts and the reasons for our choices

### Subject: Maths

Within our Mathematics curriculum, we learn about different types of Knowledge:

- Declarative knowledge: facts, formulae, concepts, principles and rules ('I know that').
- Procedural knowledge: a sequence of steps - methods, algorithms and procedures ('I know how').
- Conditional knowledge: reasoning and solving problems ('I know when').

Concept	Why learn about this concept?	Year group studied
Number	<p>Number concepts cover the skills of counting and comparing. Comparing numbers is the ability to determine more and fewer, greater than, less than and equal to, and putting a group of numbers in order. Place Value recognition is an important part of this process. In the Early Years, this begins by touch counting and develops to comparing numbers to four decimal places by the time a child reaches Year 6.</p> <p>Number is a Repton key concept because we believe that both the skills that it covers (counting and comparing) are the basis of mathematics that must be mastered by children before they can pursue advanced mathematics learning.</p>	Early Years Year 1 Year 2 Year 3 Year 4 Year 5 Year 6
Pattern	<p>Developing an awareness of pattern helps young children to notice and understand mathematical relationships. Creating and noticing patterns in objects and colours helps to provide the foundations of algebraic thinking as they provide the opportunity for young children to observe and verbalise generalisations. Children should be able to create more complex patterns (<b>concretely, pictorially, and symbolically</b>) and to be able to describe the pattern rule they used to create their own representations.</p> <p>Pattern is a Repton key concept because we believe a secure foundation in pattern creation and recognition will support our youngest learners to express their understanding verbally and to extend patterns which are presented to them. This initial exposure to pattern will be returned to in all year groups when children are exposed to new approaches to number operations work.</p>	Early Years Year 1 Year 2 Year 3 Year 4 Year 5 Year 6
Shape and Space Geometry	<p>Geometry encompasses two major components. One is reasoning about <i>shape</i>. Children learn, for example, that triangles must have three straight sides and three angles, but the angles may be narrow or wide, and the triangles may be tall or short, red or blue, or tilted in any number of ways. The second component is thinking about <i>space</i>. Children learn how objects relate to one another and to themselves in a real or imagined space.</p> <p>Mathematically, the areas of shape and space are about developing visualisation skills and understanding relationships, such as the effects of movement and combining shapes together, rather than just knowing vocabulary. Spatial skills are important for understanding other areas of maths and children need structured experiences to ensure they develop these.</p> <p>Shape and Space Geometry is a Repton key concept because we believe that a focus on actively exploring spatial relations and the properties of shapes will develop mathematical thinking and the ability to solve real-world problems.</p>	Early Years Year 1 Year 2 Year 3 Year 4 Year 5 Year 6
Measure	<p>Measurement is important in providing links between strands of mathematics as it provides a rich and meaningful context for the use of number skills and of spatial concepts. Measurement also provides links between mathematics and the wider curriculum.</p> <p>Measure is a Repton key concept because we believe that understanding measurement is essential to be able to quantify the world around us. The measuring</p>	Early Years Year 1 Year 2 Year 3 Year 4 Year 5 Year 6

	skills our children learn will go on to help them in everyday life, from cooking, to shopping, to managing their time effectively.	
Statistics	<p>Statistics is arguably the easiest way to show an example of maths being useful in real life. Almost all statistics lessons will include: data collection, data display and data analysis. However, lessons do not always run in this order. There are times when teaching about statistics prior to data collection may be beneficial. The study of statistics offers an opportunity to reinforce an understanding of number, place value and the four operations in the solving of problems. More specifically, graphs, charts and tables may offer useful links to time, fractions, ratio, proportion and the wider curriculum.</p> <p>Statistics is a key Repton concept as statistics are the sets of mathematical equations that we use to analyse the world around us. It keeps us informed about what is happening in the world. Statistics are important because our children live in an information-based world and much of this information is shared mathematically using a range of statistical presentations.</p>	<p>Early Years</p> <p>Year 1</p> <p>Year 2</p> <p>Year 3</p> <p>Year 4</p> <p>Year 5</p> <p>Year 6</p>
Algebra	<p>Algebra is a branch of Mathematics that substitutes symbols or letters for numbers. It focuses on finding the unknown or putting real-life variables into equations and then solving them. Children will solve problems with missing numbers throughout their primary education and as they approach Year 6, they will use simple formulae, describe number sequences using letters as symbols, and will find unknowns in an equation.</p> <p>Algebra is a Repton key concept because it teaches our children to follow a logical path to solve a problem. This, in turn, allows them to have a better understanding of how numbers function and work together in an equation. By having a better understanding of numbers, they will be better able to do any type of Maths.</p>	
Reasoning	<p>Reasoning in Maths is the process of applying logical and critical thinking to a mathematical problem in order to work out the correct strategy to use (and as importantly, not to use) in reaching a solution. It is sometimes seen as the glue that bonds children's mathematical skills together; it's also seen as bridging the gap between fluency and problem solving, allowing children to use their fluency to accurately solve real world problems.</p> <p>Reasoning is a key Repton concept as the ability to reason mathematically is the most important factor in a pupil's success in mathematics. Reasoning is critical in Mathematics learning because children who genuinely make sense of mathematical ideas can apply them in problem solving and unfamiliar situations and can use them as a foundation for future learning.</p>	<p>Early Years</p> <p>Year 1</p> <p>Year 2</p> <p>Year 3</p> <p>Year 4</p> <p>Year 5</p> <p>Year 6</p>
Problem Solving	<p>Problem solving in mathematics is one of the most important topics to teach; learning to problem solve helps students develop a sense of solving real-life problems and apply mathematics to real world situations. It is also used for a deeper understanding of mathematical concepts. Learning "maths facts" is not enough; students must also learn how to use these facts to develop their thinking skills.</p> <p>Problem solving is at the heart of all mathematical learning and teaching at Repton Manor. Every learning journey begins with a rich problem that is unpicked by the children. They identify what skills they will need to develop to be able to solve the problem and this is discussed alongside their teachers. These skills are then developed throughout a series of following lessons using a concrete-pictorial-abstract approach (CPA). Towards the end of the learning journey, the pupils have the opportunity to solve the problem and others that require a similar skill. By constructing the learning journey in this way, the pupils are given the opportunity to see how mathematical skills can be applied to real life problems, therefore giving it a context.</p>	<p>Early Years</p> <p>Year 1</p> <p>Year 2</p> <p>Year 3</p> <p>Year 4</p> <p>Year 5</p> <p>Year 6</p>

### **Methodology:**

At Repton Manor Primary School, we follow a Mastery for Maths curriculum using the White Rose Curriculum resources. Mastery teaching provides our children with the time to acquire a deep and transferable understanding of mathematical concepts. Children are taught to fully grasp topics by learning

them in small steps. This ensures that when they move on to more advanced lessons they have a deep understanding of foundational concepts. As a result, children benefit from improved learning retention and they develop mathematical understanding, reasoning and problem-solving abilities that will stay with them for life.

White Rose Maths also recognises the importance of enjoyment on children's journey to maths mastery. The curriculum encourages teachers to include practical and exploratory activities which make lessons fun and engaging to capture children's attention and make lessons memorable.