

Numeracy Curriculum

Numeracy vision statement

At Sunnybrow Primary School we aim to ensure that every child is entitled to a high-quality mathematics education, which will provide a foundation for their understanding of the world. As a result, they will have an appreciation of the beauty and power of mathematics and a sense of enjoyment and curiosity about the subject as it helps them to make sense of the world around them whilst developing their ability to calculate, to reason and to solve problems. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.

We understand how important it is that our children have access to a balanced curriculum that provides opportunities for children to learn vital life skills to aid their social development, and our Numeracy curriculum provides a perfect opportunity for this. We believe that mathematics provides the perfect opportunity for our children to practice their learning, build their resilience and solve problems in contextualised situations. Mathematics should have a real world purpose so children can see a point to their learning and understand why their learning is important. Learning about and solving problems linked to time, money, capacity, measurements, distance and number calculations will prepare our children for secondary school, but also provide them with key life skills, which they will need throughout their ongoing social development as they move into adulthood.

We want children to enjoy our Numeracy lessons and learn through a number of different pictorial, concrete, physical and abstract methods ensuring that no lesson is different and, where possible, provide opportunities for physical learning while working with a range of different physical equipment. It is our job as staff to promote an enthusiasm and curiosity of what we are teaching in Numeracy to ensure children become critical thinkers and are not just satisfied with what they learning, but they want to ask why.

As a school, we believe it is important that children and staff apply a 'mastery' approach to our lessons to ensure that children do not simply just recognise a concept that they are learning, but they understand why they are being taught it as well as the underpinning knowledge needed to understand solve problems associated to it.

Intent

By the end of their time in each class, the key information and skills that we want children to have and apply is as follows:

Class 1:

1. Children can count accurately from numbers 1-20.
2. Children can accurately order numbers from 1-20.
3. Children can say what is one more or one less than a given number.
4. Using quantities and objects children can add and subtract two single-digit numbers and count on or back to find the answer.

5. Children can solve problems including doubling, halving and sharing.
6. Children can use everyday language to talk about size, weight, capacity, position, distance and money to compare quantities and objects and to solve problems.
7. To recognise, create and describe patterns,
8. Children should be able to explain characteristics of everyday objects and use mathematical language to describe them.

Class 2:

Children should build upon the mathematical skills they learnt in EYFS and now be able to:

1. Have confidence and mental fluency recognising whole numbers, counting and place value.
2. Children should know the number bonds to 20 and be able to recognise the value of each digit.
3. Compare and order numbers up to 100 using the correct mathematical signs $<$, $>$, $=$.
4. Children should be able to solve number sentences and simple problems linked to the four operations by using practical resources including concrete objects and measuring tools (up to a two-digit number and a two-digit number for addition and subtraction).
5. Begin to recognise the inverse in relation to addition and subtraction and apply it to check answers and solve missing number questions.
6. Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers (*to at least 100*).
7. Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity while recognising simple equivalent fractions ($\frac{1}{2}$ and $\frac{2}{4}$) and finding $\frac{1}{2}$ of smaller numbers ($\frac{1}{2}$ of 6).
8. Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}\text{C}$); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. Recognise and use the symbols for \pounds and p and combine amounts to make a value.
9. Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times while knowing the number of minutes in an hour and hours in a day.
10. Children should be able to recognise, describe (properties), draw, compare and sort different shapes (both 2D and some basic 3D shapes) and use the correct vocabulary.
11. Solve reasoning problems both independently, and in some cases with support, linked to all the above points.

Class 3:

By the time children leave Class 3 children should be increasingly fluent with whole numbers, the 4 operations, number facts and the concept of place value. Formal written methods should be used independently to perform calculations accurately with increasingly large whole numbers.

Children should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure

that they can use measuring instruments with accuracy and make connections between measure and number. Specifically:

1. Finding 1000 more or less than any given number while counting backwards through zero including negative numbers.
2. Recognise the value of each digit in any 4-digit number while ordering and comparing numbers beyond 1000.
3. Round any number to the nearest 10, 100 and 1000.
4. Add and subtract numbers with up to 4-digits using column addition and subtraction where appropriate.
5. Recall all multiplication and division facts up to 12×12 .
6. Multiply any 2 or 3-digit number by a 1-digit number using a formal written method.
7. Add and subtract fractions with the same denominator *through a variety of increasingly complex problems*.
8. Recognise and write decimal equivalents of any number of tenths or hundredths while writing decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$.
9. Round decimals with 1dp to the nearest whole number and compare numbers with the same number of decimal places up to two decimal places.
10. Convert between different units of measure.
11. Find area and perimeter of simple rectilinear shapes using different methods.
12. Estimate and compare different units of measure including pounds and pence.
13. Read, write and convert time between analogue and digital 12 and 24 hour clocks.
14. Compare and classify geometric shapes including finding lines of symmetry, identify different types of angle (acute, obtuse) and order angles based on size.
15. Solve reasoning problems linked to all of the above.

Class 4:

Children should be fluent in the basics on Mathematics. This includes:

1. Being able to independently and confidently apply all of the previously outlined skills from other classes.
2. Have a well-developed sense of number values.
3. Know by heart key number facts (times tables, related division facts, number bonds).
4. Apply knowledge of the above to work out corrected facts.
5. Be able to follow a line of enquiry.
6. Provide generalisations and proof of findings around their investigations.
7. Be able to justify their thinking (e.g. as to what calculation strategy is the most efficient (applying formal written methods for all four operations)).
8. Solve a variety of both routine and non-routine problems.
9. Be able to select specific maths skills and operations.
10. Persevere with a line of enquiry, breaking down increasingly complex problems into a series of smaller steps.
11. Apply all of their previously learnt knowledge to end of year SAT examinations (Year 6).

Implementation

The aim of our Numeracy lessons is to provide our children with the knowledge needed to 'master' mathematics. As a result, teaching is to a mastery level, providing all children with the opportunity to access lessons and learn different concepts through pictorial, concrete and abstract means before moving applying what they have learnt to solve trickier word and reasoning style problems. This variety of approaches ensures that our lessons are inclusive, cater for all learning styles and create a learning environment which allows progress to be made. There should be opportunities for children to consolidate and revise learning from previous years (especially with number work, calculation and times tables) while different areas should be taught using different equipment, to ensure children have the fundamentals and support in place to build on and 'master' each concept.

Our long-term planning follows a similar structure across the school from Years 1-6. Place value, the four main operations and fractions, decimals and percentages (year group dependent) are taught in detail throughout the Autumn term, once teachers feel their children have a solid understanding of these fundamentals classes move on to cover the remaining areas of the Numeracy curriculum which are relevant to their particular year groups. Number work and written methods linked to the four operations are taught first and in greater detail than the other areas. Being able to recognise when to add, subtract, multiply and divide (and to be able to do it independently and competently) feeds through every other area in maths and should underpin all our children's knowledge.

In Key Stage 1 all Numeracy lessons are taught in blocks of two days so that children have longer to understand the process of what they are learning before completing work in their books. While this approach is flexible and different from Key Stage 2, it provides younger children with more time to understand and consolidate the methods that are being taught to give them the best possible opportunity of 'mastering' the subject. EYFS and Key Stage 1 lessons should be as hands on, practical and interactive as possible

Key Stage 2 teach daily Numeracy lesson which begin with a ten-minute times table focus. Each week is dedicated to a specific times table followed by a random, quick-fire test at the end of each week. Areas of Numeracy are taught in either one week or two-week blocks, this is flexible and dependant on how much content there is to cover and how quickly the children show progress and understand what is being taught. The first lesson of every new topic should be a consolidation and revision lesson, assessing the current understanding of children and what they have covered in previous years. Further lessons for the week should then be adapted (if needed) to suit the needs of the class. Lessons should be taught in the order of, consolidation, concrete, pictorial, abstract, problem solving, with concrete equipment being used throughout where needed. This allows natural progression of learning and skills throughout the week, with the abstract and problem solving only being taught when children have a secure understanding of what the abstract actually means. There should be no method taught without the children understanding why they are being taught it.

Lessons across all classes should be physical, encourage independent learning and, where possible, be as interactive as possible. High quality teacher modelling and the correct use of mathematical vocabulary should be evident. It should show teachers have a secure grasp of the concepts being taught to the extent that common misconceptions and errors are

predicted and planned into teaching or addressed as they arise during a lesson. Child led modelling should also be encouraged for those more able children to show greater depth and provide extra challenge.

Questioning used by the teachers is vitally important and should be used to encourage and challenge children to explore different concepts and work problems out for themselves. By always asking 'why?' children should be challenged to explain what they understand using the correct mathematical vocabulary. Children should be given the opportunity to ask their own questions to reach a solution, rather than just being told what to do or dictated to.

Running through all of our lessons should be a focus on reasoning and problem solving in real life contexts, promoting resilience and independence within our children and preparing them for the next stage in their personal development. Where possible plenaries should be used to talk about and solve a reasoning style problem linked to the lesson, so children become familiar with these problems in the build-up to Year 6 SATs and secondary education.

Impact

The impact of our Numeracy curriculum and teaching is measured in a variety of different ways including monitoring (book scrutiny's, learning walks and lesson observations) and evaluation (data recording, assessment monitoring and data analysis).

By looking in children's books you will see a clear progression of skills throughout the week/two-week block of work, with 4 pieces of work being completed weekly. This be evidenced through a range of different pictorial, concrete, abstract and problem-solving based activities. Where the task is based on using concrete equipment, photos will be taken to evidence the work children have completed followed by a short commentary of what was achieved. Most children will be making at least good progress throughout the year and the progression of skills class by class will be clear.

You will see that teachers have a clear understanding of their individual children's ability through differentiated tasks, level of support/scaffolding given and ensuring all work that is set is at a level which challenges children, especially for the greater depth and more able. This means all of our lessons are inclusive to children of all ability ranges and allows all children to succeed in Numeracy. Children should be being challenged by an extension or consolidation challenge at the end of a lesson, usually through some form of reasoning or problem-solving question so children are constantly being exposed to this style of questioning.

Assessment is largely formative and an ongoing process over the course of lessons, days, weeks and terms. Assessment grids are used by all teachers as a working document to monitor the progress of children across each area of Numeracy and the progression that is expected at the end of each class. This allows any children who are struggling to be picked up on and targeted for intervention to ensure knowledge is consolidated and they are not left with gaps in their knowledge as they move up through each year group. Summative assessment is used in Year 6 through termly assessment weeks which are used to assess

children's knowledge against past years SAT papers in preparation for end of year assessments.

Children Numeracy results across the school are consistently good with a high percentage of children reaching their age-related expectations at the end of each year. Arithmetic and number-based results are good across the school. There will be a greater percentage of children achieving greater depth in Numeracy across the school through an increased exposure to reasoning and problem-solving style questions and learning effective methods to solve them.

Pupil voice feedback shows that children enjoy Numeracy lessons because of their practical and interactive nature. This is shown by the pride they take in their work as well as their engagement and contribution in lessons.