

Mathematics programme

September 2021

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1. Teacher Assessment framework

The 'Engagement Model' will also be used to guide our practice over time and from September 2021

Early Learning Goals: Numbers and Shape, Space and Measure

KS1: Teacher Assessment Frameworks at the end of KS1 (Number, Measurement, Geometry, Ratio and Proportion, Statics and Algebra)

2. Whole School Progression Maps

- Number - Number and place value
- Number - Addition and subtraction
- Number - Multiplication and division
- Number - Fractions (including percentages and division)
- Measurement
- Ratio and Proportion
- Geometry - Properties of shapes
- Geometry - Position and direction
- Statics
- Algebra

Please note that we have lots of resources to help with the planning of Mathematics lessons, these are the Equals Schemes of work and the Chris Quigley materials that are available in the school office. There is also a lot of resources along the back corridor. [These resources include Inspire Mathematics scheme. We aim to ensure that all of our planning and resourcing enable maths to be taught in a way that covers the use of conceptual development and the four stages which are :-](#)

- [Learn : direct teaching to develop knowledge and deep understanding](#)
- [Guided practice : informal assessment of children's understanding](#)
- [Activity : help for children to accommodate the concepts and skills learnt](#)
- [Practice : further enhancement to the accommodation of concepts and skills](#)

This cycle of conceptual development should be repeated each time a new concept is introduced so mastery is achieved in a structured and coherent manner, without the risk of a child not fulfilling their potential.

The spiral, cumulative approach relies on building mathematical content progressively over time, we need to therefore teach the content of the curriculum using the resources that we have in school to fulfil the above stages of development. It is also important that we do not rush children through the teaching of concepts, this could lead to gaps in knowledge and misconceptions, going slowly ensures that have a depth of understanding and not a superficial understanding. Using the knowledge that they have gained in different settings, at different times of the day and with different staff is also very important.

We believe that all learning should include the development of :-

Metacognition - monitoring of one's own thinking Self-regulation of learning

Process - reasoning, communication and connections, thinking skills and heuristics, application and modelling

Concepts - numerical, algebraic, geometrical, statistical, probabilistic, analytical

Skills - numerical calculation, algebraic manipulation, spatial visualisation, data analysis, measurement, use of mathematical tools and estimation

Attitudes - beliefs, interests, appreciation, confidence and perseverance

The assessment tool B-squared and MAPP can help with planning progression and the setting of targets and learning intentions.

Teacher Assessment Framework

A stage before

For our pupils there is a stage before this, we need to think about the pre-number stage of learning. What do we do and how do we do this to support this learning?

In green below are some ideas of activities that you may use there are lots of resources and ideas along the back corridor and in the Equals schemes of work

Early Years Foundation Stage: Taken from 2021 Early Years Foundation Stage Handbook

Early Learning Goals: Mathematics: This involves providing children with opportunities to develop and improve their skills of counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces and measures.

ELG Number

- Children to count reliably with numbers from one to 20

Use of different resources such as Numicon, real life objects, outside space with counting mats, counting books, number rhymes, Teddy bears picnic, pegging washing on a line, 10 green bottles, use of Stiles practice books level 1, Inspire maths level 1 and Heineman maths

- Place these numbers in order

Lady bird game, building towers, play dough, snack time, cars and car parking, fishing game

- Children to say which number is one more or one less than a given number
- Children use quantities of objects

PE activities, number rhymes, snack time, counting games, fishing game, treasure hunt, plastic jars with number lids

- Children add and subtract two single digit numbers and count on and back to find the answer

PE activities, snack time, large dice game, Structured play activities such as a shop

- Children solve problems, including doubling, halving and sharing

ELG Shape, space and measure

- Children use everyday language to talk about size, weight, capacity, distance, time and money to compare quantities and objects and to solve problems

Use of farm animals for small and large, feely bag with small and large objects in, shop games using money, class clock with times clearly marked, bags with more and less objects in

- Children recognise, create and describe patterns

Use different objects to create patterns, look for patterns in the environment, colour patterns using different materials, make patterns with food, stacking bricks in a pattern

- Children explore characteristics of everyday objects and shapes and use mathematical language to describe them

Key stage 1: Taken from Teacher Assessment framework at the end of Key stage 1. 2019

KS1

Working Below expected

The pupil can:

- read and write numbers in numerals up to 100
- partition a two-digit number into tens and ones to demonstrate an understanding of place value, though they may use structured resources¹ to support them
- add and subtract two-digit numbers and ones, and two-digit numbers and tens, where no regrouping is required, explaining their method verbally, in pictures or using apparatus (e.g. $23 + 5$; $46 + 20$; $16 - 5$; $88 - 30$)
- recall at least four of the six² number bonds for 10 and reason about associated facts (e.g. $6 + 4 = 10$, therefore $4 + 6 = 10$ and $10 - 6 = 4$)
- count in twos, fives and tens from 0 and use this to solve problems
- know the value of different coins

- name some common 2-D and 3-D shapes from a group of shapes or from pictures of the shapes and describe some of their properties (e.g. triangles, rectangles, squares, circles, cuboids, cubes, pyramids and spheres).

1 For example, base 10 apparatus. 2 Key number bonds to 10 are: $0+10$, $1+9$, $2+8$, $3+7$, $4+6$, $5+5$.

Working at expected

The pupil can:

- read scales* in divisions of ones, twos, fives and tens
 - partition any two-digit number into different combinations of tens and ones, explaining their thinking verbally, in pictures or using apparatus
 - add and subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus (e.g. $48 + 35$; $72 - 17$)
 - recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships (e.g. If $7 + 3 = 10$ then $17 + 3 = 20$; if $7 - 3 = 4$ then $17 - 3 = 14$; leading to if $14 + 3 = 17$, then $3 + 14 = 17$, $17 - 14 = 3$ and $17 - 3 = 14$)
 - recall multiplication and division facts for 2, 5 and 10 and use them to solve simple problems, demonstrating an understanding of commutativity as necessary
 - identify $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{4}$, of a number or shape, and know that all parts must be equal parts of the whole
 - use different coins to make the same amount
 - read the time on a clock to the nearest 15 minutes
 - name and describe properties of 2-D and 3-D shapes, including number of sides, vertices, edges, faces and lines of symmetry.
- * The scale can be in the form of a number line or a practical measuring situation.

Working above expected

The pupil can:

- read scales* where not all numbers on the scale are given and estimate points in between
- recall and use multiplication and division facts for 2, 5 and 10 and make deductions outside known multiplication facts

- use reasoning about numbers and relationships to solve more complex problems and explain their thinking (e.g. $29 + 17 = 15 + 4 + \dots$; 'together Jack and Sam have £14. Jack has £2 more than Sam. How much money does Sam have?' etc)
 - solve unfamiliar word problems that involve more than one step (e.g. 'which has the most biscuits, 4 packets of biscuits with 5 in each packet or 3 packets of biscuits with 10 in each packet?')
 - read the time on a clock to the nearest 5 minutes
 - describe similarities and differences of 2-D and 3-D shapes, using their properties (e.g. that two different 2-D shapes both have only one line of symmetry; that a cube and a cuboid have the same number of edges, faces and vertices, but different dimensions).
- * The scale can be in the form of a number line or a practical measuring situation.

KS2 Mathematics: The mathematics framework has been removed. This was set out in the government response to the 'Primary assessment in England' public consultation.