

Maths Overview and Sequencing of Learning

Our Maths curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge to build on prior learning and prepare pupils for their next steps.

In our approach to the teaching of Mathematics we believe that everyone can learn and enjoy mathematics. Mathematical learning behaviours are developed based on pupils' individual motivators and learning needs. This ensures that they are able to focus and engage fully as learners who reason and seek to make connections. Significant time is spent developing deep understanding of the key ideas that are needed to underpin future learning.

The key skills and knowledge we want to develop in Maths, are:

<u>Number</u> – cardinality and counting – being able to count, not only by reciting numbers in the form of a list.

<u>Ordering and Comparing</u> – being able to make comparisons between groups, auantities, and numbers. This involves an understanding of 'worth' and of 'more' and 'less.'

<u>Calculation</u> – understanding how numbers are made from other numbers and how smaller numbers can be added together to make bigger numbers.

<u>Pattern</u> – understanding mathematical relationships by identifying and understanding different types of patterns. Initially, this will likely be with colour and shape, but will ultimately lead to the ability to identify mathematical patterns.

<u>Shape and Space</u> – wider mathematical thinking is developed through an awareness of shapes, their similarities, and differences and how they can fit together.

<u>Measurement</u> – Comparing different aspects and properties of measurement such as height, weight and volume. Eventually, this will lead to comparison using standard units.

Those pupils who are not yet able to access the above early mathematical concepts will develop their understanding of the following precursor concepts through the areas of engagement. Pupils will explore through sensory object play, visual and auditory activities. These concepts anchor a child's

mathematical thinking and are essential for the growth of further mathematics. Deep and meaningful engagement with the below concepts must come before a child is ready to attend to the early mathematical concepts:

<u>Attributes</u> – Exploration of the properties or qualities of objects that allow us to describe and classify the world around us. Experiencing and developing understanding that:

- We perceive attributes of the world around us through our senses.
- Attributes can be used to group.
- Language allows us to describe attributes with increasing precision.

<u>Comparison</u> – Realising sameness and difference. Experiencing and developing understanding that:

- Comparison depends on recognising attributes.
- Recognising attributes makes it possible to notice sameness and difference.
- Noticing sameness and difference allows for matching, sorting, ordering and problem-solving.

<u>Pattern</u> – Exploring rhythm, sequence, and regularity that allows for anticipation and prediction. Experiencing and developing understanding that:

- A pattern involves a set of defining elements.
- Regularity occurs when the defining elements recur in sequence.
- When a regular sequence begins, there is an expectation that it will include the defining elements.

<u>Change</u> – Realisation that something becomes different. Experiencing and developing understanding that:

- Change may be qualitative or quantitative.
- The difference may be the result of joining, separating, or of transforming.
- To respond to change, the difference between the initial condition and the changed condition must be recognised.

The Maths curriculum has been carefully designed and sequenced to provide

pupils with a secure, coherent knowledge of key mathematical concepts which can be applied meaningfully to their daily lives. At all stages, the curriculum links to previous content and concepts and identifies later links.

The Maths curriculum is carefully planned to ensure concepts are taught in optimal order to support children's understanding. Plans are tailored to the needs of each child/class, adapting the learning areas and opportunities to the interests, needs and level of learning of the individual and class. They consist of basic mapping of concepts, resources and activities. Learning activities cover a range of areas (including communication, interaction, emotional development and social skills) so that pupils make consistent progress towards their aspirational targets outlined in their Education Health and Care Plan (EHCP).

As Mathematical skills become more developed children will begin to apply these skills within their exploration of the mathematically rich classroom. Developing anticipation of patterns in sound and movement through physical action games, musical instruments, singing and chanting. They will begin to understand and predict routines in their own lives to build an early understanding of sequence and patterns: first we... then... now...

Pupils will begin to investigate concepts of shape and space, exploring and arranging objects of different shapes, sizes and weights — starting with activities involving stacking and knocking down, posting things through holes, playing hiding games and covering things up. Staff will model mathematical language in songs, rhymes and play and will use their knowledge of individual motivators to engage pupils with the number, shape and position of objects around them or in books. Even before children begin to use these words for themselves, they look and listen with interest to adults using them.

As their understanding of mathematical concepts becomes more secure, pupils will begin to apply the principles of counting in practical activities and functional learning activities. Over time they will demonstrate an understanding of more and less and the relative 'worth' of a number or a quantity. They will develop a growing sense of numbers, develop their understanding of the link between numbers and quantity and investigate the partitioning of quantities. They will know how numbers relate to one another and be able to compare and order them and will explore how quantities change when items are added or taken away. Pupils will demonstrate understanding of spatial concepts and use the language of position and direction. They will learn to give and follow instructions to navigate simple routes. They will be able to identify shapes and use mathematical terms to describe them. They will make 2D maps and 3D models. They will compose and decompose shapes, knowing how shapes combine to make other shapes.

Our mathematics curriculum prepares pupils for future learning and transition to Key Stage 3 by giving a sound and secure understanding of the fundamental mathematical concepts which serve as the foundation for further mathematical learning. By providing rich opportunities to apply these concepts in meaningful, functional contexts, we aspire to enable our pupils to apply their mathematical understanding in the wider community to allow them to live fulfilling and independent lives, both now and in adulthood.

Sequence of Learning for Learners on our Informal Pathway

The Routes for Learning Routemap (diagram on next page) focuses on learners' early cognitive development, their communication and social interaction skills, and their interaction with the environment. The most important milestones are shown in orange boxes. The learning descriptors are numbered for ease of reference and do not show an expected sequence of learning. Likely next steps are, instead, indicated with arrows. Some of our learners on the informal pathway also demonstrate learning at Band 1.

Sequencing of Learning for Informal Pathway learners



-Number

--Band 1

----[] I can show an interest in number rhymes e.g. smiling, wanting to hold resources, and number stories and games, including personalised songs with a growing sequence, and turn taking games

----[] I can ask for 'more'

----[] I can use the language to describe quantities: "more", "a lot", "gone", "all gone"

----[] I can respond to the experience of losing items or having them taken from me

----[] I can follow a sequence of pictures/numbers during number rhymes and songs, anticipating the end of a familiar sequence (as this later leads to understanding the importance of the last number in the count

----[] I can follow a counting sequence to 5 in imitation

----[] I can say some counting words randomly

----[] I can pick up a single item when asked for "one"

---Band 2

----[] I can join in, by saying/signing/indicating at least one of the numbers in a familiar number rhyme

----[] I can respond to and join in familiar number rhymes, stories, songs and games

----[] I can give out 1 object to each person in a group where there are the correct number of objects/too many objects, and indicate awareness of too many/some left over

----[] I can place objects/sort pictures into sets of 1/lots

----[] I can ask for one/lots and notices/aware when given incorrect amount by adult

----[] I can recite some number names in sequence

----[] I can touch or point to objects as an adult touches them and counts

----[] I can match related items such as knife/fork, spoon/bowl

----[] I can make groups of two, starting with familiar pairs

----[] I can ask for one/two items and notice/be aware when given incorrect number by adult

---Band 3

----[] I can join in rote counting to 3

----[] I can join in rote counting to 5

----[] I can point to objects (up to three as they count, saying the correct number word per item

----[] I can begin to count when asked "how many"

----[] I can accurately count real objects to three in a line/in a group

----[] I can count reliably to three

----[] I can get one/two/three items from a larger group on request

----[] I can make sets of up to three items

----[] I can use numbers to three in familiar activities and games

----[] I can join in by saying/signing/indicating at least one of the numbers in a new number rhyme

----[] I can join in a range of new number rhymes/songs/stories/games with some assistance or encouragement

----[] I can rote count to 5 independently

----[] I can rote count backwards from 3 i.e. 3, 2, 1 gone

---Band 4

----[] I can join in rote counting to 10

----[] I can accurately count real objects to five in a line/in a group

----[] I can accurately count pictures to five in a line/in a group

----[] I can get one/two/three/four/five items from a larger group on request

----[] I can make sets of up to 5 items

----[] I can count at least five objects reliably

---Band 5

----[] I can join in rote counting to 20

----[] I can rote count to 10 independently

----[] I can rote count backwards from 5

----[] I can continue to rote count onwards from a small number e.g. starting to count at 3 not 1

----[] I can get up to ten items from a larger group on request

----[] I can join in rote counting to 30 from zero, 1 or any given number

----[] I can rote count to 20 independently from zero, 1 or any given number

----[] I can count between two given numbers e.g. 5 and 15

----[] I can count sets of real objects accurately to 20

----[] I can count sets of real objects accurately to 30 by grouping in tens

----[] I can say which number is one more or one less than a given number

--Representing Numbers

---Band 2

----[] I can use Signalong signs, boardmaker symbols for one/lots

----[] I can match objects to Numicon shapes 1-3 (these may be enlarged

----[] I can select the correct amount/Numicon shape when asked to give one/two from a choice of one/two

---Band 3

----[] I can match objects to Numicon shapes 1-3

----[] I can recognise and name Numicon shapes 1-3

----[] I can begin to ascribe number meanings to some of their mark making

----[] I can use some language of quantities in everyday situations i.e. "more, "lots", "one"

---Band 4

----[] I can recognise and name Numicon shapes 1-5

----[] I can match, select, and name numerals 0-5

----[] I can show an interest in/notice numerals in the environment

----[] I can count real objects to five in line/group and label them with the correct Numicon shape/numerals

----[] I can count pictures to five in a line/group and label them with the correct Numicon shape/numerals

----[] I can put quantities to five out in a Numicon pattern

----[] I can put quantities to numerals up to 5 (including zero)

----[] I can separate a group of three/four objects in different ways, and am beginning to understand that there is still the same number there (no matter how they are arranged)

---Band 5

----[] I can recognise Numicon shapes to 10 (holes should not be counted)

----[] I can recognise numerals 0-10

----[] I can order Numicon shapes to 10

----[] I can match numerals to Numicon shapes

----[] I can order numerals to 10

----[] I can fill in missing numbers in a number line to 10

----[] I can put quantities to ten out in a Numicon pattern

----[] I can put quantities to numerals 0-10

----[] I can count pictures to ten in a line/group and label with the correct numeral

----[] I can read the number words one to ten

----[] I can recognise Numicon shapes to 20 (holes should not be counted)

- ----[] I recognise numerals 0-20
- ----[] I can order Numicon shapes to 20

----[] I can match numerals to Numicon shapes to 20

----[] I can order numerals to 20

----[] I can fill in missing numbers in a number line to 20

----[] I can put out quantities to at least 20 in a group/in a Numicon pattern

----[] I can count pictures to 20 in a line/group and label with the correct numeral

--Ordering and Comparing

---Band 2

----[] I can move along a blank number line one step/space at a time

----[] I can demonstrate a series of actions during the singing of a familiar song i.e. knows what comes next

----[] I can sequence two photos of familiar events/activities

---Band 3

----[] I can begin to make comparisons between quantities

----[] I can demonstrate a series of actions during the singing of a new song i.e. remembers two or three actions in sequence

----[] I can order Numicon shapes 1-3

----[] I can be aware when there are too few items to complete 1:1 matching and ask for more to complete 1:1 matching

----[] I can know that a group of items change in quantity when something is added or taken away

----[] I can demonstrate an understanding of the concept "more"

---Band 4

----[] I can know that a group of items changes in quantity when something is added or taken away

----[] I can compare two groups of objects and comment when they have the same number/different number

----[] I can identify the smaller of two groups of objects

----[] I can demonstrate an understanding of "less" e.g. indicating which bottle has less water in item

---Band 5

----[] I can identify the smallest/biggest of at least three groups of objects ----[] I can use comparative language of addition for quantities in conversation e.g. when giving out plates at snack "I need two more" ----[] I can recognise differences in quantity

----[] I can understand and use the terms "first", "second", "third", "last" when describing the position of objects, people or events/activities ----[] I can place three non-sequential numbers up to 20 in order of size

----[] I use everyday language to compare quantities e.g. big, bigger, biggest

---Understanding calculation

---Band 4

----[] When asked to "add one", in practical situations, I can get one more object then count "how many now" to 5

---Band 5

----[] I can find the total of two groups of objects by counting them all ----[] I can find the correct Numicon shape that matches two Numicon shapes put together

----[] I can add one to a group of objects (1-10) and count "how many now?" ----[] I can take one away from groups of objects (1-10) and count "how many now"?

----[] I can respond appropriately to "add one" or "take one away" from a number of objects, in practical situations

----[] I am beginning to understand the term "equals" as "balances"

----[] I can add and subtract two single-digit numbers using quantities and objects

----[] I can add and subtract by counting on/back to find the answer

----[] I can solve problems involving doubling, halving and sharing

-Shape, Space and Measure

--Shape and Space

---Band 1

----[] I look for hidden objects (i.e. demonstrating an understanding of object permanence)

----[] I join in rolling activities e.g. rolling a ball, rolling objects down a slope

---Band 2

----[] I can fit simple 2d shapes into spaces on inset boards/jigsaw puzzles ----[] I can build my own simple structures and arrangements with blocks, road/rail tracks...

----[] I search intentionally for objects in their usual place e.g. remembers where the play dough is kept and goes and gets it

----[] I can return objects to where they belong using pictures or shapes of objects as cues

----[] I can hunt for familiar objects that are out of sight i.e. hide and seek games

----[] I am beginning to sort objects by type e.g. puts all the apple on one plate and tomatoes on another at snack, with adult support

---Band 3

----[] I can match by colour - red, yellow, blue

----[] I notice simple shapes and patterns in pictures g can find the circle in a shape picture of a train

----[] I am beginning to sort/categorise objects by shape

----[] I explore, with support, 3d shapes e.g. rolling them, fitting them into shape sorter, building, painting boxes

----[] I search for objects not in their usual place

----[] I understand words/signs/symbols for positions - in, on, under, inside

---Band 4

----[] I show an interest in shape and space by playing with shapes/making arrangements with objects

----[] I show awareness of similarities of shapes in the environment

----[] I can select described objects from a collection e.g. find all the round shapes

----[] I am beginning to talk about the shape of everyday objects e.g. round ----[] I can name simple shapes (circle, square, triangle, rectangle) and talk about them e.g. shape picture ----[] I use positional language - in, on, under, inside, next to e.g. to describe what I see, to give an instruction..

----[] I respond to 'forwards'/'backwards' correctly, through my own movement and through moving a toy

----[] I can draw a circle in imitation

----[] I can join the dots to draw a square, triangle, and rectangle

----[] I can sort/categorise 2d shapes i.e. squares, circles, triangles etc.

----[] I can sort/categorise objects by colour e.g. red, yellow, blue etc.

----[] I can trace a souare, triangle, rectangle shape

---Band 5

----[] I explore the characteristics of everyday objects and shapes and use mathematical language to describe them

----[] I am beginning to use mathematical names for 'solid' 3d shapes and 'flat' 2d shapes, and mathematical terms to describe shapes e.g. straight sides, curved sides

----[] I can select a particular named shape

----[] I can correctly describe my own position as behind/next to others

----[] I can describe shapes in simple models, pictures and patterns, naming some of the shapes used

----[] I can copy simple patterns using common shapes

----[] I can recreate simple models, copying from a photograph

----[] I recognise, create and describe patterns

--Measure

---Band 1

----[] I recognise big things and little (small) things, in meaningful contexts ----[] I show an understanding of classroom routines e.g. attempts to hang out coat up on entry into room

----[] I am beginning to show awareness of the passage of time by anticipating events in the day e.g. knows about to have dinner, knows going to Rumpus (not naming the day)

----[] I am familiar with daily classroom/school routines such as good morning, snack, dinnertime

----[] I can match objects by size e.g. little (small) car to little (small) car, puts big (large) football in basket with other big (large) footballs

----[] I show that I am aware if it is light or dark

---Band 2

----[] I can take things out of containers and can put things in containers (filling and emptying) e.g. collecting things in a bag

----[] I can find big/little(small) objects on request

----[] When given two similar objects, e.g. two boxes, I can say which is the big one, where there is a marked difference

----[] I associate a sequence of actions with daily routines

----[] I show that I understand 'now' in relation to things happening

----[] I show that I understand now/next e.g. in relation to class/individual timetable

---Band 3

----[] I use the vocabulary big/little correctly to describe the size of an object ----[] I can compare the overall size of two similar objects where the difference isn't great e.g. identifies the biggest of two nesting toys ----[] I am beginning to sort/categorise objects by size ----[] I anticipate specific time-based events such as dinner time, home time ----[] I understand some vocabulary related to immediate past/future e.g. before, later, soon

---Band 4

----[] I am beginning to talk about the size of everyday objects e.g. tall.. ----[] I can find the biggest/smallest/longest/shortest etc. from a choice of 3 ----[] I use familiar words in practical situations when comparing sizes/quantities - less, enough, not enough, more, long, longer, short, shortest, full, empty etc. ----[] I can pour water into a container and stop at a given point

---Band 5

----[] I use everyday language to talk about size when comparing quantities/objects and to solve problems

----[] I can order two/three items by length

----[] I can order two/three items by height

----[] I can compare two items by weight and pick out the heavy one/light one ----[] I use everyday language to talk about weight when comparing quantities/objects and to solve problems

----[] I can compare at least two items by capacity and pick out the full one, one with less in

----[] I use everyday language to talk about capacity when comparing quantities/objects and to solve problems

----[] I am beginning to use time words in everyday communication, although not always accurately i.e. today, yesterday, tomorrow

----[] I use the names of the days of the week, and significant times of the day e.g. dinner time, home time

----[] I can order/sequence familiar events e.g. on a daily timetable

----[] I am beginning to use time related vocabulary such as morning, afternoon, evening, night

----[] I can measure short periods of time in simple ways

----[] I use everyday language to talk about time when comparing quantities/objects and to solve problems

----[] I am beginning to use everyday language related to money — buy ----[] I use everyday language to talk about money when comparing quantities/objects and to solve problems

----[] I use everyday language to talk about position when comparing quantities/objects and to solve problems

----[] I use everyday language to talk about distance when comparing quantities/objects and to solve problems

Formal Pathway learners will follow the national curriculum at a level appropriate to their ability

https://assets.publishing.service.gov.uk/media/5a7da548ed915d2ac884cb07/PRIMARY_national_ curriculum -_ Mathematics_220714.pdf