STATUTORY REQUIREMENTS

Math

Year 1

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Teaching should ensure that appropriate connections are made between the sections on 'number' and 'shape, space and measures'.

During key stage 1 pupils develop their knowledge and understanding of mathematics through practical activity, exploration and discussion. They learn to count, read, write and order numbers to 100 and beyond. They develop a range of mental calculation skills and use these confidently in different settings. They learn about shape and space through practical activity which builds on their understanding of their immediate environment. They begin to grasp mathematical language, using it to talk about their methods and explain their reasoning when solving problems.

The mathematics programmes of study and the primary framework for mathematics are fully aligned. The framework provides a detailed basis for implementing the statutory requirements of the programme of study for key stage 1 in mathematics.

Building on the early learning goals

Pupils' prior experience of mathematics includes:

- counting and using numbers to at least 10 in familiar contexts
- recognising numerals 1 to 9
- talking about and creating simple patterns
- beginning to understand addition as combining two groups of objects and subtraction as 'taking away'
- describing the shape and size of solid and flat shapes
- using everyday words to describe position

- using early mathematical ideas to solve practical problems.

Note about sections

There is no separate section of the programme of study numbered Ma1 that corresponds to the first attainment target, using and applying mathematics. Teaching requirements relating to this attainment target are included within the other sections of the programme of study.

Ma2 Number

Knowledge, skills and understanding

<u>Using and applying number</u>

1. Pupils should be taught to:

<u>Problem solving</u>

a. approach problems involving number, and data presented in a variety of forms, in order to identify what they need to do

b. develop flexible approaches to problem solving and look for ways to overcome difficulties

c. make decisions about which operations and problem-solving strategies to use

d. organise and check their work

<u>Communicating</u>

e. use the correct language, symbols and vocabulary associated with number and data

f. communicate in spoken, pictorial and written form, at first using informal language and recording, then mathematical language and symbols

<u>Reasoning</u>

g. present results in an organised way

h. understand a general statement and investigate whether particular cases match it

i. explain their methods and reasoning when solving problems involving number and data.

<u>Numbers and the number system</u>

2. Pupils should be taught to:

Counting

a. count reliably up to 20 objects at first and recognise that if the objects are rearranged the number stays the same; be familiar with the numbers 11 to 20; gradually extend counting to 100 and beyond

Number patterns and sequences

b. create and describe number patterns; explore and record patterns related to addition and subtraction, and then patterns of multiples of 2, 5 and 10 explaining the patterns and 6 using them to make predictions; recognise sequences, including odd and even numbers to 30 then beyond; recognise the relationship between halving and doubling

The number system

c. read and write numbers to 20 at first and then to 100 or beyond; understand and use the vocabulary of comparing and ordering these numbers; recognise that the position of a digit gives its value and know what each digit represents, including zero as a placeholder; order a set of one and two-digit numbers and position them on a number line and hundred-square; round any two-digit number to the nearest 10.

Calculations

3. Pupils should be taught to:

Number operations and the relationships between them

a. understand addition and use related vocabulary; recognise that addition can be done in any order; understand subtraction as both 'take away' and 'difference' and use the related vocabulary; recognise that subtraction is the inverse of addition; give the subtraction corresponding to an addition and vice versa; use the symbol '=' to represent equality; solve simple missing number problems [for example, 6 = 2 + ?] b. understand multiplication as repeated addition; understand that halving is the inverse of doubling and find one half and one quarter of shapes and small numbers of objects; begin to understand division as grouping (repeated subtraction); use vocabulary associated with multiplication and division

Mental methods

c. develop rapid recall of number facts: know addition and subtraction facts to 10 and use these to derive facts with totals to 20, know multiplication facts for the x2 and x10 multiplication tables and derive corresponding division facts, know doubles of numbers to 10 and halves of even numbers to 20

d. develop a range of mental methods for finding, from known facts, those that they cannot recall, including adding 10 to any single-digit number, then adding and subtracting a multiple of 10 to or from a two-digit number; develop a variety of methods for adding and subtracting, including making use of the facts that addition can be done in any order and that subtraction is the inverse of addition

e. carry out simple calculations of the form 40 + 30 = ?, 40 + ? = 100, 56 - ? = 10; record calculations in a number sentence, using the symbols +, -, x , ÷ and = correctly [for example, 7 + 2 = 9] .

Solving numerical problems

4. Pupils should be taught to:

a. choose sensible calculation methods to solve whole-number problems (including problems involving money or measures), drawing on their understanding of the operations

b. check that their answers are reasonable and explain their methods or reasoning.

Processing, representing and interpreting data

5. Pupils should be taught to:

a. solve a relevant problem by using simple lists, tables and charts to sort, classify and organise information

b. discuss what they have done and explain their results.

Explanatory notes and cross-curriculum references

Note for 1e, 1f - Cross reference to English

En1 Speaking and listening: Speaking

1. To speak clearly, fluently and confidently to different people, pupils should be taught to:

b. choose words with precision c. organise what they say

En3 Writing: Composition

1. Pupils should be taught to:

c. put their ideas into sentences

Note for 1f - ICT opportunity
Pupils could use ICT to communicate results using appropriate mathematical symbols.

Note for 1i
Explaining methods is an important foundation for reasoning and proof in later key stages.

Note for 5
This provides a basis for pupils' understanding of handling data in later key stages.

Ma3 Shape, space and measures

Teaching should ensure that appropriate connections are made between the sections on 'number' and 'shape, space and measures'.

Knowledge, skills and understanding

Using and applying shape, space and measures
1. Pupils should be taught to:

Problem solving
a. try different approaches and find ways of overcoming difficulties when solving shape and space problems
b. select and use appropriate mathematical equipment when solving problems involving measures or measurement
c. select and use appropriate equipment and materials when solving shape and space problems

Communicating
d. use the correct language and vocabulary for shape, space and measures

Reasoning
e. recognise simple spatial patterns and relationships and make predictions about them f. use mathematical communication and explanation skills.

Understanding patterns and properties of shape

2. Pupils should be taught to:

a. describe properties of shapes that they can see or visualise using the related vocabulary

b. observe, handle and describe common 2D and 3- shapes; name and describe the mathematical features of common 2D and 3D shapes, including triangles of various kinds, rectangles including squares, circles, cubes, cuboids, then hexagons, pentagons, cylinders, pyramids, cones and spheres

c. create 2D shapes and 3D shapes

d. recognise reflective symmetry in familiar 2D shapes and patterns.

Understanding properties of position and movement

3. Pupils should be taught to:

a. observe, visualise and describe positions, directions and movements using common 9 words

b. recognise movements in a straight line (translations) and rotations, and combine them in simple ways [for example, give instructions to get to the headteacher's office or for rotating a programmable toy]

c. recognise right angles.

Understanding measures

4. Pupils should be taught to: a. estimate the size of objects and order them by direct comparison using appropriate language; put familiar events in chronological order; compare and measure objects using uniform non-standard units [for example, a straw, wooden cubes], then with a standard unit of length (cm, m), weight (kg), capacity (l) [for example, 'longer or shorter than a metre rule', 'three-and-a-bit litre jugs']; compare the durations of events using a standard unit of time

b. understand angle as a measure of turn using whole turns, half-turns and quarter-turns

c. estimate, measure and weigh objects; choose and use simple measuring instruments, reading and interpreting numbers, and scales to the nearest labelled division.

Explanatory notes and cross-curriculum references

Note for 1b - ICT opportunity

Pupils could use both digital and analogue devices to measure weight or time.

Note for 1d - Cross reference to English

En1 Speaking and listening: Speaking

1. To speak clearly, fluently and confidently to different people, pupils should be taught to:

b. choose words with precision

Note for 1f

These skills are important foundations for geometrical reasoning and proof in later key stages.

Note for 4a

In the international system of units, kilogram (kg) is the unit of mass. In practice, mass is measured by weighing; scales measure or compare a force (a push or a pull). At key stage 1 it is acceptable to treat weight as synonymous with mass.

Note for 4b - ICT opportunity

Pupils could programme a toy to follow a path involving half- and quarter-turns.

Breadth of study

Teaching should ensure that appropriate connections are made between the sections on 'number' and 'shape, space and measures'.

Knowledge, skills and understanding

1. During the key stage, pupils should be taught the knowledge, skills and understanding through: a. practical activity, exploration and discussion

b. using mathematical ideas in practical activities, then recording these using objects, pictures, diagrams, words, numbers and symbols

c. using mental images of numbers and their relationships to support the development of mental calculation strategies

d. estimating, drawing and measuring in a range of practical contexts

e. drawing inferences from data in practical activities

f. exploring and using a variety of resources and materials, including ICT

g. activities that encourage them to make connections between number work and othe