Appendix A

Overview of Learning Targets and Objectives - Key Stages 1 and 2

NUMBER DIMENSION

Key Stage 1 (P1-P3)

Dimension Learning Targets for Key Stage

To develop an ever-improving capability to

- understand the concepts of whole numbers and simple fractions
- manipulate whole numbers and simple fractions
- understand and use simple properties of operations on numbers
- apply the knowledge and concepts of manipulating numbers to formulate and solve simple problems

Learning Objectives for Key Stage

Learners

(1) read, write and order numbers up to 5 digits, and understand the meaning of place value.

(2) (a) understand the concepts of addition and subtraction and their relationship.
(b) compute addition and subtraction within 4 places.
(c) understand and use the commutative and associative properties of addition.
(d) solve relevant practical problems of addition and subtraction within 4 places.

Key Stage 2 (P4-P6)

Dimension Learning Targets for Key Stage

To develop an ever-improving capability to

- understand the concepts of different forms of numbers
- interconvert numbers in different forms
- manipulate numbers and check the reasonableness of results
- understand and use properties of operations on numbers
- apply the knowledge and concepts of manipulating numbers to formulate and solve problems

Learning Objectives for Key Stage

Learners

(1) (a) read, write, round off large numbers in everyday life and estimate large quantities.
(b) recognize prime numbers and composite numbers and find prime numbers within 150.
(c) use index notation to represent composite numbers.
(d) recognize the Chinese and Roman numeration systems.
(e) recognize the development of some calculating devices.

NUMBER DIMENSION (CONT.)

Key Stage 1 (P1-P3)

Learning Objectives for Key Stage

(3) (a) understand the concepts of multiplication and division and their relationship.
(b) compute multiplication with 1-digit multiplier and multiplicand up to 3 digits, and division with 1-digit divisor and dividend up to 3 digits.
(c) understand and use the commutative property of multiplication.
(d) solve relevant practical problems of multiplication and division.
(e) recognize multiples, factors and relationship between them.

(4) solve problems on mixed operations of

(a) addition and subtraction,
(b) multiplication and addition,
(c) multiplication and subtraction,
(d) division and addition,
(e) division and subtraction,
(f) multiplication and division,
with number of operations not exceeding two.

(5) solve simple problems on the use of brackets in mixed operations of addition and subtraction with at most three operations.

(6) (a) recognize coins and notes up to $1000, and use them in simple contexts.
(b) read and write price tags, change units and apply the four rules to solve problems involving money.

(7) (a) understand and use fractions in everyday life.
(b) compute addition and subtraction of fractions with the same denominator. (Answers should not be greater than 1 and no simplification is needed.)

Key Stage 2 (P4-P6)

(2) (a) compute multiplication : a number up to 3 digits with a number up to 2 digits, and compute division : divisor up to 3 digits and dividend up to 4 digits, and check by approximation whether the answers are reasonable.
(b) understand and use the commutative, associative and distributive properties of multiplication.
(c) solve practical problems involving multiplication or division of whole numbers.
(d) solve simple mixed operations with integers and problems involving the four rules, including the use of simple brackets.

(3) recognize and compute common multiples, common factors, lowest common multiple (L.C.M.) and highest common factor (H.C.F.) of not more than 3 numbers.

(4) (a) recognize the meaning of proper fractions, improper fractions, mixed numbers and equivalent fractions.
(b) perform addition, subtraction, multiplication, division and simple mixed operations of simple fractions and reduce the answers to the simplest form, and check the results by estimation or approximation.
(c) solve simple problems on fractions.

NUMBER DIMENSION (CONT.)

Key Stage 1 (P1-P3)	Key Stage 2 (P4-P6)
Learning Objectives for Key Stage	
	(5) (a) read, write and order decimals, and understand place values of decimals. (b) perform addition, subtraction, multiplication, division and simple mixed operations of decimals up to two decimal places, apply the rounding off concept, and check the results by estimation or approximation. (c) understand percentages and perform conversions between decimals, fractions and percentages. (d) solve simple practical problems on decimals and percentages.
	(6) recognize squares and square roots of whole numbers.
	(7) (a) understand the idea of direct proportion and solve simple practical problems on direct proportion by unitary method. (b) understand the idea of inverse proportion and solve simple practical problems on inverse proportion by unitary method.
	(8) calculate the average of a small group of data, taking examples from everyday life.

MEASURES DIMENSION

Key Stage 1 (P1-P3)

Dimension Learning Targets for Key Stage

To develop an ever-improving capability to

- choose and use a variety of non-standard units of basic measures in measuring objects
- understand the need of using standard units of measurement
- select appropriate standard units of measurement for different situations
- integrate the knowledge of number, measures and shape & space to solve intuitively simple measurement problems

Learning Objectives for Key Stage

Learners

(1) (a) compare and order objects of more or less the same length, and recognize the need to use standard units of measures of length.
(b) recognize and use millimetre, centimetre, metre and kilometre.
(c) understand perimeter and calculate perimeters of rectangles and squares.

(2) (a) recognize and use second, minute, half hour, hour, a.m. and p.m..
(b) recognize the months of a year, the days of a week, the number of days in each month, the number of days in a year and a leap year.
(c) read time from a digital clock and dates from a calendar.

Key Stage 2 (P4-P6)

Dimension Learning Targets for Key Stage

To develop an ever-improving capability to

- choose and use a variety of non-standard and standard units of various measures in measuring objects
- select and justify appropriate standard units of measurement for different situations
- recognize the degree of accuracy and the approximate nature of measurement
- inquire and use simple measurement formulas
- integrate the knowledge of number, measures and shape & space to formulate and solve simple measurement problems

Learning Objectives for Key Stage

Learners

(1) understand the relationship between units of measurement in metric system.

(2) (a) understand the concept of area.
(b) use non-standard units of area to compare objects and recognize the need to use standard units.
(c) recognize and use square centimetre and square metre, and recognize that measurement is approximate in nature and choose the degree of accuracy appropriate for a particular purpose.
(d) understand and use the formulas for areas of rectangles and squares.
(e) find areas of parallelograms, triangles and trapeziums by counting square and by formulas, and find areas of polygons.

MEASURES DIMENSION (CONT.)

Key Stage 1 (P1-P3)

Learning Objectives for Key Stage

(3) (a) compare and order objects of more or less the same weight and recognize the need to use standard units of measures of weight.
(b) recognize and use gram and kilogram.

(4) recognize the degree Celsius and read thermometers.

(5) (a) compare and order vessels of more or less the same capacity and recognize the need to use standard units of measures of capacity.
(b) recognize and use litre.

Key Stage 2 (P4-P6)

(3) (a) recognize the relationship between diameters and circumferences of circles.
(b) recognize π and solve simple problems involving diameter, radius and circumference of a circle using $\pi = 3.14$ or $22/7$.

(4) (a) recognize and use millilitre.
(b) understand the concept of volume, and recognize and use cubic centimetre.
(c) recognize the relationship between litre/millilitre and cubic centimetre.
(d) recognize cubic metre and its use.
(e) understand and use the formulas for volumes of cubes and cuboids.
(f) find volumes of irregular solids.

(5) recognize the 24-hour clock and understand the relationship between the units of time and solve simple practical problems on time.

(6) (a) understand the concept of speed, and recognize and use the units 'metre per second (m/s)' and 'kilometre per hour (km/h)'.
(b) solve simple problems on speed.

(7) understand scale and use appropriate scale to draw plans.

(8) (a) compare and measure angles, and draw angles up to 360° using a protractor.
(b) make special angles by folding papers.

ALGEBRA DIMENSION

Key Stage 1 (P1-P3)	Key Stage 2 (P4-P6)

Dimension Learning Targets for Key Stage

The ALGEBRA Dimension is not included at this key stage.	To develop an ever-improving capability to • recognize the use of symbols to represent unknown numbers • communicate simple mathematical facts/relations using symbols • manipulate simple relations involving symbols, and apply these knowledge and skills to formulate and solve simple problems and check the validity of results • explore simple number patterns

Learning Objectives for Key Stage

The ALGEBRA Dimension is not included at this key stage.	Learners (1) recognize the use of symbols to stand for unknown numbers. (2) record facts using algebraic symbols. (3) solve simple equations, limiting to those requiring at most two steps in the solution, and check answers. (4) solve simple practical problems by equations. (5) recognize and appreciate simple number patterns such as square numbers, triangular numbers and rectangular numbers.

SHAPE & SPACE DIMENSION

Key Stage 1 (P1-P3)

Dimension Learning Targets for Key Stage

To develop an ever-improving capability to

- identify, describe and classify 2-dimensional & 3-dimensional shapes
- recognize intuitively the elementary properties of 2-dimensional and 3-dimensional shapes
- make 2-dimensional and 3-dimensional shapes from given information
- recognize, describe, appreciate and use patterns of shapes
- develop a basic sense of position and direction

Learning Objectives for Key Stage

Learners

(1) (a) recognize, describe and make simple 2-dimensional shapes and classify them.
(b) recognize, describe and make simple 3-dimensional shapes and classify them.
(c) recognize angles.

(2) recognize and appreciate tessellation/tile patterns.

(3) recognize intuitively (reflective) symmetry in a variety of shapes in 2-dimension and 3-dimension, and make symmetrical shapes.

(4) recognize intuitively straight lines, curves and parallel lines.

(5) (a) use common words to describe position.
(b) recognize the four basic directions.

Key Stage 2 (P4-P6)

Dimension Learning Targets for Key Stage

To develop an ever-improving capability to

- understand intuitively the properties of 2-dimensional and 3-dimensional shapes, and make use of this understanding to classify and make 2-dimensional and 3-dimensional shapes
- develop a more elaborate sense of position and direction
- specify location by means of appropriate measurements
- integrate the knowledge of measures and shape & space to formulate and solve 2-dimensional problems

Learning Objectives for Key Stage

Learners

(1) (a) understand intuitively the properties of quadrilaterals and classify quadrilaterals.
(b) recognize the properties of circles.

(2) (a) understand intuitively the properties of some pyramids & prisms and appreciate the relations between the number of edges, vertices and sides of bases of pyramids and prisms.
(b) design nets and make simple solids.

(3) (a) recognize the directions N, E, S, W, NE, SE, NW and SW, and use them to describe directions.
(b) recognize and use bearings.
(c) perform simple surveying activities to find ther positions of objects from the measurement of directions and distances.

DATA HANDLING DIMENSION

Dimension Learning Targets for Key Stage

Key Stage 1 (P1-P3)

To develop an ever-improving capability to

- collect, compare and classify discrete statistical data according to given criteria
- construct simple statistical graphs showing relationships among data and interpret them
- formulate and solve simple problems arising from collected data and constructed graphs

Key Stage 2 (P4-P6)

To develop an ever-improving capability to

- select criteria for grouping and organizing discrete statistical data
- apply simple arithmetic and appropriate scales in constructing and interpreting more complex statistical/line graphs
- show relationships among data using a variety of statistical and graphical representations
- recognize and use relationships and patterns from graphs
- formulate and solve problems arising from collected data and constructed graphs

Learning Objectives for Key Stage

Learners

(1) collect and classify simple data on topics from the environment.

(2) draw graphs (pictograms, block graphs and bar charts) using one-to-one representation and make simple interpretation.

(3) present and interpret simple bar charts of greater frequency counts, using one-to-two or one-to-ten representation.

Learners

(1) collect and group data of greater frequency counts.

(2) (a) present and interpret pictograms using one-to-ten or one-to-hundred representation.
(b) present and interpret bar charts of large frequency counts using one-to-thousand or even smaller scales and compound bar charts.
(c) present and interpret line graphs.
(d) interpret pie charts.

(3) design and use suitable graphs to present data.

(4) understand average and make estimates from bar charts.

(5) solve problems on direct proportion by using straight line graphs.

(6) look for relationships, patterns or trends from graphs.