Year 4 Maths Objectives

Place Value

COUNTING	count backwards through zero to include negative numbers count in multiples of 6, 7, 9, 25 and 1000 Count on or back in 10s, 100s from any 2- or 3-digit number. Count on or back in repeated steps of 1, 100, 1000. Count up through next multiple of 10, 100, 1000. find 1000 more or less than a given number
COMPARING NUMBERS	order and compare numbers beyond 1000 Order a set of whole numbers up to 10 000. *compare numbers with the same number of decimal places up to two decimal places* (copied from Fractions) Recognise odd and even numbers up to 1000 and some of their properties, e.g. sums, differences of pairs of odd/even numbers. Read and write the vocabulary of comparing and ordering numbers. Use symbols = < > correctly. Give a number lying between two others. Recognise negative numbers in context: number line, thermometer.
IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	identify, represent and estimate numbers using different representations Read and write the vocabulary of estimation and approximation. Estimate up to 250 objects. Estimate a proportion (fraction).
READING & WRITING NUMBERS	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. Read and write whole numbers up to 10 000, in figures and in words.
UNDERSTANDING PLACE VALUE	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) *find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths* (copied from Fractions)
ROUNDING	round any number to the nearest 10, 100 or 1 000 Round any three-digit number to the nearest 10 or 100. Round any positive number less than 1000 to nearest 10. *round decimals with one decimal place to the nearest whole number* (copied from Fractions)
PROBLEM SOLVING	solve number and practical problems that involve all of the above and with increasingly large positive numbers Investigate general statements about familiar numbers. Solve number problems and puzzles. Explain methods and reasoning orally and in writing.

Addition & Subtraction

NUMBER BONDS	Add strings of 4 numbers. Within 1000, addition of multiples of 10 and 100. Recall addition and subtraction facts for each number up to 20. Derive addition pairs that total 100, multiples of 50 that total 1000.

MENTAL CALCULATION	Add and subtract numbers mentally, including: - a four-digit number and ones - a four-digit number and tens - a four-digit number and hundreds adding four 3-digit numbers Add/subtract 1, 10, 100 to any whole number. Add/subtract 10, 100 1000 from any two-/three-digit number. Add/subtract a pair of two-digit numbers (not crossing 10 or 100 boundary) Add several small numbers by finding pairs that total 10, or 9 or 11. Partition into tens and units, adding tens first. Add three 2-digit multiples of 10 Add more than two whole numbers less than 1000, and money. Use number facts and place value to add/subtract mentally any pair of two-digit whole numbers. Understand commutative law of addition. Understand principle (not name) of commutative law for + not –. Round up or down and adjust: 2999 + 1999 (3000 + 2000 – 2) Find a small difference by counting up.
WRITTEN METHODS	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Use informal pencil and paper methods to support, record or explain addition and subtraction. Develop written methods for + and – of whole numbers less than 1000. Develop/refine written methods for addition/subtraction, include money. Develop, refine written methods for column addition/subtraction. Write subtraction fact corresponding to given addition fact.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	estimate and use inverse operations to check answers to a calculation Explain and record methods. Check with addition in a different order. Check with equivalent calculation. Check using knowledge of sums of odd/even numbers.
PROBLEM SOLVING	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

Multiplication & Division

MULTIPLICATION & DIVISION FACTS	*count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value) recall multiplication and division facts for multiplication tables up to 12 × 12 Recall multiplication facts in x2, x3, x4, x5, x10 tables and derive division facts. Use closely related facts, e.g. derive x9 or x11 from x10, or derive x6 from x4 plus x2. Partition and multiply. Multiply by partitioning, e.g. 23 x 4.

MENTAL CALCULATION	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Derive doubles of whole numbers to 50, corresponding halves. Derive doubles of multiples of 10 to 500, corresponding halves. Derive doubles of multiples of 100 to 5000, corresponding halves. Identify near doubles. Multiply a two-digit number by 10. Multiply and divide whole numbers by 10. Multiply or divide whole numbers by 10 or 100. Multiply TU by U, e.g. 13 x 3. Multiply and divide an integer up to 1000 by 10; understand the effect. Understand commutative and associative laws of multiplication. Divide a whole number of £ by 2, 4 , 5 or 10 to give £p. Understand distributive law. Round up or down after division. recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers) Use doubling and halving of two-digit numbers, e.g. x4 = double double, x5 = x10 halve, x20 = x10 double, x8 = x4 double, 1/4 = half of one 1/2.
WRITTEN CALCULATION	multiply two-digit and three-digit numbers by a one-digit number using formal written layout Approximating first, use informal pencil and paper methods to multiply and divide. Develop and refine written methods for TU x U. Develop and refine written methods for TU ÷ U.
PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS	recognise and use factor pairs and commutativity in mental calculations (repeated) Recognise multiples of 2, 3, 4, 5, 10, up to 10th multiple.
PROBLEM SOLVING	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects Choose appropriate number operations and calculation methods to solve money and 'real life' word problems with one or more steps.
INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	*estimate and use inverse operations to check answers to a calculation* (copied from Addition and Subtraction) Explain working. Check with inverse operation. Check results by approximating.

Algebra

EQUATIONS	solve problems, *including* ***missing number*** *problems, using number facts, place value, and more complex addition and subtraction.* *solve problems, including* ***missing number*** *problems, involving multiplication and division, including integer scaling*
FORMULAE	*Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit.* *(Copied from NSG measurement)*
SEQUENCES	Recognise, extend number sequences formed by counting from any number in steps of constant size, e.g. 25 to 500. Recognise, extend number sequences formed by counting from any number in steps of constant size, extend beyond zero if counting back. Solve number puzzles, recognise patterns, generalise and predict.

Fractions (including decimals & percentages)

COUNTING IN FRACTIONAL STEPS	count up and down in hundredths
RECOGNISING FRACTIONS	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten Use fraction notation. Recognise fractions that are several parts of a whole, and mixed numbers. Find fractions of shapes.
COMPARING FRACTIONS	compare and order unit fractions 1/3, ¼ and 1/2, and fractions with the same denominators Relate fractions to division and find simple fractions of quantities. Compare a fraction with one half, and say whether it is greater or less.
COMPARING DECIMALS	compare numbers with the same number of decimal places up to two decimal places Use decimal notation for tenths, hundredths (money, metres and centimetres) and use in context. Order decimals with two places.
ROUNDING INCLUDING DECIMALS	round decimals with one decimal place to the nearest whole number Round to the nearest £ or metre. Convert £ to p, or metres to centimetres, and vice versa.
EQUIVALENCE	recognise and show, using diagrams, families of common equivalent fractions Recognise equivalence of simple fractions. recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$ Begin to use ideas of simple proportion. Recognise the equivalence of decimal, fraction forms of one half, one quarter and tenths.

ADDITION & SUBTRACTION OF FRACTIONS	add and subtract fractions with the same denominator Identify two fractions with total of 1.
MULTIPLICATION & DIVISION OF DECIMALS	find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
PROBLEM SOLVING	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number solve simple measure and money problems involving fractions and decimals to two decimal places.

Geometry: Position & Direction

POSITION, DIRECTION & MOVEMENT	describe positions on a 2-D grid as coordinates in the first quadrant Recognise position on square grids with numbered lines. describe movements between positions as translations of a given unit to the left/right and up/down Read and begin to write the vocabulary of movement. plot specified points and draw sides to complete a given polygon
PATTERN	Solve shape problems or puzzles. Explain reasoning and methods.

Geometry: Properties of shape

IDENTIFYING SHAPES & THEIR PROPERTIES	identify lines of symmetry in 2-D shapes presented in different orientations Describe and visualise 3-D and 2-D shapes, inc. tetrahedron, heptagon. Recognise equilateral and isosceles triangles. Visualise solid shapes from 2–D drawings. Identify simple nets. Recognise clockwise, anti-clockwise.
DRAWING & CONSTRUCTING	complete a simple symmetric figure with respect to a specific line of symmetry Sketch reflection of simple shape in a mirror.
COMPARING & CLASSIFYING	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Classify shapes (right angles, regularity, symmetry). Investigate general statements about shapes. Make shapes and discuss properties.
ANGLES	identify acute and obtuse angles and compare and order angles up to two right angles by size Start to draw, measure and order angles. Use eight compass points. Recognise horizontal and vertical lines. Begin to measure angles in degrees. Know whole turn, 360*, 4 right angles; quarter turn, 90*, 1 right angle; half turn, 180°, 2 right angles. Recognise 45* as half a right angle.

Measurement

COMPARING & ESTIMATING	estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)
MEASURING & CALCULATING	estimate, compare and calculate **different measures,** including **money in pounds and pence** (appears also in Comparing) Convert £ to p. Choose appropriate number operations and calculation methods to solve money or 'real life' word problems with one/two steps. **Length:** Use, read, write km, m, cm, mm and mile. Know and use relationships between units. Know 1/2, 1/4, 3/4, 1/10 of 1 kilometre in m, 1 metre in cm or mm. Suggest suitable units and equipment to estimate or measure length Record metres and centimetres using decimals, and other measurements using mixed units. Convert up to 1000 cm to metres and vice versa. **Mass:** Measure and compare using kilograms and grams, and know and use the relationship between them. Know 1/4, 1/2, 3/4 and 1/10 of 1 kg in grams. Suggest suitable units and equipment to estimate or measure mass. Record measurements to suitable degree of accuracy, using mixed units, or the nearest whole/half/quarter unit (e.g. 3.25 kg). **Capacity:** Use, read, write litre (l), millilitre (ml), pint. Know 1/4, 1/2, 3/4, 1/10 of 1 litre in ml. Suggest suitable units and equipment to estimate or measure capacity. Record measurements to suitable degree of accuracy, using mixed units, or the nearest whole/half/quarter unit (e.g. 3.25 litres). Read a variety of scales and dials to a suitable degree of accuracy. measure and calculate the **perimeter** of a rectilinear figure and simple shapes (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares Measure and calculate area of rectangles and simple shapes, using counting methods and standard units (square centimetres). Choose appropriate number operations and calculation methods to solve measurement word problems with one or more steps. Explain and record methods.
TELLING THE TIME	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) Use, read, write vocabulary of time. Read time to 1 min. on analogue/12-hour digital clock. Use 9:53, a.m. and p.m.

	Estimate and check times using seconds, minutes, hours. Read timetables and use this year's calendar. solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)
CONVERTING	convert between different units of measure (e.g. kilometre to metre; hour to minute) read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)

Statistics

INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
SOLVING PROBLEMS	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. Solve a given problem by collecting, classifying, representing and interpreting data in tally charts, frequency tables, pictograms (symbol) representing 2, 5, 10 units). Solve a given problem by collecting, classifying, representing and interpreting data in bar charts; intervals labelled in 2s, 5s, 10s, 20s. Include use of computer. Solve a given problem by collecting, classifying, representing and interpreting data in Venn and Carroll diagrams: two criteria. Use a computer and a branching tree program to sort shapes or numbers.