# Maths - 1. Place Value

**Context**
This is a **three week** unit. The children will develop their understanding of numbers of numbers to 1,000 and represent numbers in different ways. They partition three digit numbers and investigate number lines. Finally, the children compare and order three digit numbers.

**Ready to Progress Criteria**
3NPV–1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.
3NPV–2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.
3NPV–3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.
3NPV–4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.

**Prior Knowledge**
Count:
• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
Represent:
• read and write numbers to at least 100 in numerals and in words
• identify, represent and estimate numbers using different representations, including the number line
Use and Compare:
• recognise the place value of each digit in a two-digit number (tens, ones)
• compare and order numbers from 0 up to 100; use <, > and = signs
Problems/Rounding:
• use place value and number facts to solve problems

**Knowledge and Skills**
Count:
• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
Represent:
• identify, represent and estimate numbers using different representations
• read and write numbers up to 1000 in numerals and in words
Use and Compare:
• recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
• compare and order numbers up to 1000
Problems/Rounding:
• solve number problems and practical problems involving these ideas

**Future Knowledge**
Count:
• count in multiples of 6, 7, 9, 25 and 1000
• count backwards through zero to include negative numbers
Represent:
• identify, represent and estimate numbers using different representations
• 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
Use and Compare:
• find 1000 more or less than a given number • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
• order and compare numbers beyond 1000
• (read, write) order and compare numbers to at least 1 000 000 and determine the value of each digit
Problems/Rounding:
• round any number to the nearest 10, 100 or 1000
• solve number and practical problems that involve all of the above and with increasingly large positive numbers

**Manipulatives**
bead strings, straws, base 10, jottings part whole model

**Vocabulary**
hundreds, tens , ones, zero , place value , greater than, less than , order, more , less , partition, digit

**Maths Keys**
3NF–1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.multiplication tables as multiples of the corresponding number

# Maths - 2. Addition and Subtraction

**Context**

This is a **five week** unit. Children start by using mental methods to solve calculations before moving on to the formal written method. The unit ends with work on compliments to 100 and exploring inverses (using the part whole model to support understanding)

**Ready to Progress Criteria**

3AS–1 Calculate complements to 100.
3AS–2 Add and subtract up to three-digit numbers using columnar methods.
3AS–3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure; Understand and use the commutative property of addition and understand the related property for subtraction..

**Prior Knowledge**

Calculations:
• add and subtract
numbers using concrete objects,
pictorial representations, and mentally, including:
- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one digit numbers

Problems:
• solve problems with addition and subtraction:
- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods

**Knowledge and Skills**

Calculations:
• add and subtract numbers mentally,
including: - a three-digit number and ones
- a three-digit number and tens
- a three-digit number and hundreds
• add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
Problems:
• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

**Future Knowledge**

Calculations:
• add and subtract numbers with up to 4 digits using the formal written methods of columnar
addition and subtraction where appropriate
Problems:
• solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

**Manipulatives etc**

base 10, part whole model , bar model , number lines hundred square , place value chart, place value counters

**Vocabulary**

add, total, plus, sum, more, altogether, difference, subtract, less, minus, take away, column addition, column subtraction, exchange, estimate, inverse operation, solve problems, number facts, place value

**Maths Keys**

3NF–1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.multiplication tables as multiples of the corresponding number

## Maths - 3. Multiplication and Division A

**Context**

This is a **four week** unit. In this unit, the children focus on the structure of multiplication and division . The children start by revising the 2, 5 and 10 times table. Then they explore multiplying and dividing by 3, 4 and 8.

**Ready to Progress Criteria**

3MD–1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division.

3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.

**Prior Knowledge**

Recall/Use:

• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

• show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Calculations:

• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

Problems:

• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

**Knowledge and Skills**

Recall/Use:

**• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables**

Calculations:

• write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two digit numbers times one-digit numbers, using mental and progressing to formal written methods

Problems:

• solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

**Future Knowledge**

Recall/Use:

• recall multiplication and division facts for multiplication tables up to 12 × 12

• 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 • recognise and use factor pairs and commutativity in mental calculations

Calculations:

• multiply two-digit and three-digit numbers by a one digit number using formal written layout

Problems:

• 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

**Manipulatives etc**

arrays , counters, number tracks, number lines, coins - to apply counting, bar model

**Vocabulary**

times tables, multiply by, divided by, array, fact families, regrouping

**Maths Keys**

3NF–1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.multiplication tables as multiples of the corresponding number

# Maths - 4. Multiplication and Division B

**Context**

This is a **three week** unit. The children develop efficient strategies for multiplication and division. They start by multiplying and dividing with multiples of 10. Then they multiply a two digit number by a one digit number. Finally, they divide a two digit number by a one digit number.

**Ready to Progress Criteria**

3MD–1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division.
3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.
3NF–3 Apply place-value knowledge to known additive and **multiplicative** number facts (scaling facts by 10).

**Prior Knowledge**

Recall/Use:
• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
• show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
Calculations:
• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
Problems:
• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

**Knowledge and Skills**

Recall/Use:
• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
**Calculations:**
**• write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two digit numbers times one-digit numbers, using mental and progressing to formal written methods**
**Problems:**
**• solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects**

**Future Knowledge**

Recall/Use:
• recall multiplication and division facts for multiplication tables up to 12 × 12
• 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 • recognise and use factor pairs and commutativity in mental calculations
Calculations:
• multiply two-digit
and three-digit
numbers by a one digit number using
formal written layout
Problems:
• 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

**Manipulatives etc**

arrays, counters, number tracks, number lines
coins - to apply counting

**Vocabulary**

times tables, multiply by, divided by, array, fact families, regrouping

**Maths Keys**

3NF–1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.multiplication tables as multiples of the corresponding number

## Maths - 5. Length and Perimeter

| | | |
|---|---|---|
| **Context**<br>This is a **three week** unit. Children measure in metres, centimetres and millimetres. They explore equivalent lengths and calculate with length. Finally, they learn how to measure and calculate perimeter for the first time. | **Ready to Progress Criteria**<br>There is no RtP criteria for this unit. | |
| **Prior Knowledge**<br>Using Measures:<br>• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers, scales<br>• compare and order lengths and record the results using >, < and =<br>Perimeter:<br>None | **Knowledge and Skills**<br>Using Measures:<br>• measure, compare, add and subtract: lengths (m/cm/mm)<br>Perimeter:<br>• measure the perimeter of simple 2-D shapes | **Future Knowledge**<br>Using Measures:<br>•Convert between different units of measure [for example, kilometre to metre<br>Perimeter:<br>• measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares |
| **Manipulatives etc**<br>Part-whole models, bar models and double number lines | **Vocabulary**<br>metre (m), centimetre (cm), millimetre (mm), height, length, width, perimeter, further/furthest, higher/highest, longer/longest, shorter/shortest, taller/tallest | **Maths Keys**<br>3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number |

# Maths - 6. Fractions A

**Context**
This is a **three week** unit. The children work with unit and non-unit fractions, exploring the role of the numerator and denominator. They count in fractions along a number line and focus on looking at equivalence.

**Ready to Progress Criteria**
3F–1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.
3F–3 Reason about the location of any fraction within 1 in the linear number system.

**Prior Knowledge**
Recognise and Write:
• recognise, find, name and write fractions ⅓ ¼ 2/4 ¾ of a length, shape, set of objects or quantity

Compare:
• Recognise the equivalence of 2/4 and ½
Calculations:
• write simple fractions
for example, ½ of 6 = 3

**Knowledge and Skills**
Recognise and Write:
**• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10**
**• recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators**
**• recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators**
**Compare:**
**• recognise and show, using diagrams, equivalent fractions with small denominators**
**• compare and order unit fractions, and fractions with the same denominato**rs
Calculations:
• add and subtract fractions with the same denominator within one whole [for example 5/7 +1/7 = 6/7
Solve Problems:
• solve problems that involve all of the above

**Future Knowledge**
Recognise and Write:
• count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
• convert mixed numbers to improper fractions and vice versa.
Compare:
• recognise and show, using diagrams, families of common equivalent fractions
Fractions
Calculations:
• add and subtract fractions with the same denominator
Solve Problems:
• 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

**Manipulatives etc**
range of representations including: bar models and number lines

**Vocabulary**
numerator, denominator, unit fraction, non-unit fraction, equivalent, halves, thirds, quarters, fifths, sixths, eights, tenths

**Maths Keys**
3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number

## Maths - 7. Mass and Capacity

| | | |
|---|---|---|
| **Context**<br>This is a **three week** unit. The unit starts with mass before moving on to volume and capacity. The children explore equivalence and also add and subtract units of measure. | **Ready to Progress Criteria**<br>There is no RtP criteria for this unit. | |
| **Prior Knowledge**<br>Using Measures:<br>• choose and use appropriate standard units to estimate and measure mass (kg/g); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, and measuring vessels<br>•compare and order lengths, mass, volume/capacity and record the results using >, < and = | **Knowledge and Skills**<br>Using Measures:<br>• measure, compare, add and subtract: mass (kg/g); volume/capacity (l/ml) | **Future Knowledge**<br>Using Measures:<br>• Convert between different units of measure [for example, kilometre to metre; hour to minute]<br>• estimate, compare and calculate different measures |
| **Manipulatives**<br>scales , number lines, measuring equipment | **Vocabulary**<br>mass, gram, kilogram, capacity, volume, millilitre, litre, lighter, heavier | **Maths Keys**<br>3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number. |

# Maths - 8. Fractions B

**Context**
This is a **two week** unit. The children add and subtract fractions with common denominators. They move on to finding unit and non unit fractions of amounts.

**Ready to Progress Criteria**
3F–2 Find unit fractions of quantities using known division facts (multiplication tables fluency).
3F–4 Add and subtract fractions with the same denominator, within 1.

**Prior Knowledge**
Recognise and Write:
• recognise, find, name and write fractions ⅓ ¼ 2/4 ¾ of a length, shape, set of objects or quantity

Compare:
• Recognise the equivalence of 2/4 and ½
Calculations:
• write simple fractions
for example, ½ of 6 =
3

**Knowledge and Skills**
Recognise and Write:
**• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10**
**• recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators**
**• recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators**
**Compare:**
**• recognise and show, using diagrams, equivalent fractions with small denominators**
**• compare and order unit fractions, and fractions with the same denominator**s
Calculations:
• add and subtract fractions with the same denominator within one whole [for example 5/7 +1/7 = 6/7
Solve Problems:
• solve problems that involve all of the above

**Future Knowledge**
Recognise and Write:
• count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
• convert mixed numbers to improper fractions and vice versa.
Compare:
• recognise and show, using diagrams, families of common equivalent fractions
Fractions
Calculations:
• add and subtract fractions with the same denominator
Solve Problems:
• 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

**Manipulatives etc**
range of representations, bar models , number lines

**Vocabulary**
numerator, denominator, unit fraction, non-unit fraction, equivalent, halves, thirds, quarters, fifths, sixths, eights, tenths

**Maths Keys**
3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.

# Maths - 9. Money

**Context**
This is a **two week** unit. The children revise what pounds and pence are. They convert between pounds and pence. They calculate with money, starting with manipulatives, moving on to more efficient methods. The unit ends with work on finding change.

**Ready to Progress Criteria**
There is no RtP criteria for this unit.

**Prior Knowledge**
Money:
• recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
• find different combinations of coins that equal the same amounts of money
• solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

**Knowledge and Skills**
Money:
• add and subtract amounts of money to give change, using both £ and p in practical contexts

**Future Knowledge**
Money:
• estimate, compare and calculate different measures, including money in pounds and pence

**Manipulatives etc**
Physical and pictorial representations of notes and coins

**Vocabulary**
amount, change, coin, combination, convert, note, pence, penny, pounds, value

**Maths Keys**
3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).

# Maths - 10. Time

**Context**
This is a **three week** unit. Children practise telling time to the nearest minute whilst developing their understanding of am and pm. They are introduced to digital time for the first time. The children then explore the relationship between different units of time.

**Ready to Progress Criteria**
There is no RtP criteria for this unit.

**Prior Knowledge**
Time:
• compare and sequence intervals of time
• tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
• know the number of minutes in an hour and the number of hours in a day

**Knowledge and Skills**
Time:
• tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
• estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight
• know the number of seconds in a minute and the number of days in each month, year and leap year
• compare durations of events [for example to calculate the time taken by particular events or tasks]

**Future Knowledge**
Time:
• read, write and convert time between analogue and digital 12- and 24-hour clocks
• solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days

**Manipulatives**
clocks , number lines

**Vocabulary**
12-hour time, 24-hour time, Roman numerals, analogue, digital, hours, minutes, seconds, o'clock, half past, quarter past, quarter to, midday, midnight, noon

**Maths Keys**
3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).

# Maths - 11. Shape

**Context**

This is a **two week** unit. The children are introduced to angles (as a measure of turn) for the first time. They look at perpendicular and parallel lines before moving on to describing 2D and 3D shapes.

**Ready to Progress Criteria**

3G–1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.

3G–2 Draw polygons by joining marked points, and identify parallel and perpendicular sides

**Prior Knowledge**

2-D shapes;

• recognise and name common 2-D shapes [for example, rectangles (including squares), circles and triangles]

• identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line

• identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]

3-D shapes:

• recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]

• compare and sort common 3-D shapes and everyday objects

**Knowledge and Skills**

2-D shapes;

• draw 2-D shapes

3-D shapes:

• make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

Angles and lines:

• recognise angles as a property of shape or a description of a turn

• identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle

• identify horizontal and vertical lines and pairs of perpendicular and parallel lines

**Future Knowledge**

2-D shapes;

• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify lines of symmetry in 2-D shapes presented in different orientations

Angles and lines:

• identify acute and obtuse angles and compare and order angles up to two right angles by size

• identify lines of symmetry in 2-D shapes presented in different orientations

• complete a simple symmetric figure with respect to a specific line of symmetry

**Manipulatives etc**

printouts of 2d shapes , 3d shapes , geo boards
elastic bands, lollipop sticks, modelling clay

**Vocabulary**

quarter turn, half turn, three-quarter turn, angle, right angle, acute, obtuse, horizontal, vertical, parallel, perpendicular, polygon, two-dimensional, three-dimensional, flat face, curved face, edge, curved edge, vertex, vertices, apex

**Maths Keys**

3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).

| Maths - 12. Statistics | | |
|---|---|---|
| **Context**<br>This is a **two week** unit. The children interpret then draw pictograms and bar charts using given data. They then move on to collect their own data. Finally, the children explore two way tables for the first time. | **Ready to Progress Criteria**<br>There is no RtP criteria for this unit. | |
| **Prior Knowledge**<br>Present and interpret data:<br>• interpret and construct simple pictograms, tally charts, block diagrams and simple tables<br>Solve statistical problems:<br>• ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity<br>• ask and answer questions about totalling and comparing categorical data | **Knowledge and Skills**<br>Present and interpret data:•<br>• interpret and present data using bar charts, pictograms and tables<br>Solve statistical problems:<br>• solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables | **Future Knowledge**<br><br>Present and interpret data:•<br>• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs<br>Solve statistical problems:<br>• solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs |
| **Manipulatives etc**<br>pictograms , bar charts, two way tables | **Vocabulary**<br>data, pictogram, symbol, bar chart, horizontal axis, vertical axis, axes, scales, intervals, table, interpret | **Maths Keys**<br>3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). |