Maths Year 4 Curriculum

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Phase 1

Domain: **Place Value**

Revision year 3

- I can decompose any two-digit number using standard and non-standard partitioning
- I can add and subtract across 10
- I am secure in addition and subtraction facts that bridge 10 through continued practise

- I know that 10 tens are equivalent to 1 hundred
- I know that 100 is 10 times the size of ten
- I can identify and work out how many tens there are in three-digit multiples of 10
- I can recognise the place value of each digit in a three-digit number
- I can compose and decompose three-digit numbers using standard and non-standard partitioning
- I can reason about the location of any three-digit number in a linear number sequence
- I can identify the multiple of 10 and 100 before and after any three-digit number

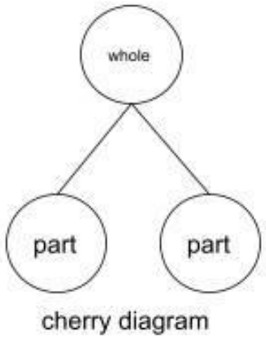
New learning- KPIs:

- I can use column method to add and subtract 3-digit numbers – revision from year 3

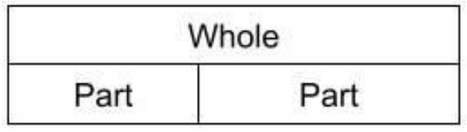
- I know that 10 hundreds are equivalent to 1 thousand and that 1,000 is 10 times the size of 100; I can apply this to identify and work out how many 100s there are in other four-digit multiples of 100
- I can recognise the place value of each digit in four-digit numbers using standard and non-standard partitioning
- I can reason about the location of any four-digit number in the linear number system including identifying multiples of 1000 before and after
- I can round any four-digit number to the nearest 10, 100 and 1000
- **I can read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value**
- **Orders and compares numbers beyond 1000**
- **Counts backwards through zero to include negative numbers**

Visualisation:

- **Part whole model** to show partitioning in a standard and non-standard way
- **Bar model** to model the partitioning of numbers

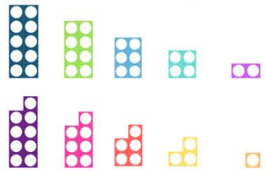


cherry diagram

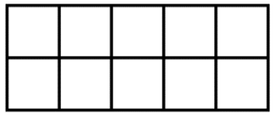


Bar model

Resources to support learning:



Numicon can be used to support children with number bonds to 10.



Tens frames with **place value counters** to support children to understand that 10 of something fit into…

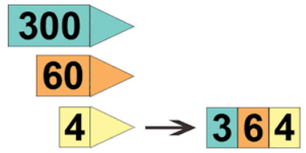
Dienes to show children the relationship between numbers and what 'ten times bigger' looks like

Number lines to show children the position of numbers including negative numbers and how to round to the nearest multiple of…

10,000	20,000	30,000	40,000	50,000
1000	2000	3000	4000	5000
100	200	300	400	500
1	2	3	4	5
0.1	0.2	0.3	0.4	0.5
0.01	0.02	0.03	0.04	0.05
0.001	0.002	0.003	0.004	0.005

Common misconceptions:

- Finding the multiple before or after the number which needs rounding for example multiple of 10 before 64 is 50
- Not understanding the relationship between tens and ones for example not knowing that 13 tens is equivalent to 130 ones
- Not having a secure understanding of the structure of numbers and not understanding what a number is made up of
- Non-standard partitioning being inaccuarte because of basic addition and subtraction facts

		Gattengo charts to the value of each digit in a 4-digit number; this resource helps children to build numbers and understand the value of the digits in the number  **Place Value Arrow** cards to show the value of each digit in a number	

Vocabulary:
ones, tens, hundreds, digit, one-, two- or three-digit number, 'teens' number
place, place value, stands for, represents, exchange, the same number as, as many as, equal to
Of two objects/amounts:
greater, more, larger, bigger, less, fewer, smaller
Of three or more objects/amounts:
greatest, most, biggest, largest, least, fewest, smallest
one more, ten more, one hundred more, one less, ten less, one hundred less
compare, order, size
first, second, third… tenth… twentieth, twenty-first, twenty-second…
last, last but one, before, after, next, between, half-way between above, below

Domain: **Number facts**

Revision year 3:	**New learning- KPIs:**	**Resources to support learning:**	**Common misconceptions:**
• I can divide 100 into 2, 4, 5 and 10 equal parts • I can read number lines and scales marked in multiples of 100 with 2, 4, 5 and 10 equal parts	• I can divide 1,000 into 2, 4, 5 and 10 equal parts • I can read scales/number lines marked in **multiples** of 1,000 with 2,4,5 and 10 equal parts • I can apply place-value knowledge to know **additive** and **multiplicative** number facts (**scaling** facts to 100)	 **Cuisenaire rods** where the orange rod can represent 1 whole	• A common error when calculating complements is to end up with a total that is too large, as children typically make an extra unit of 10 • Not making the parts equal – especially when placing intervals on a number line

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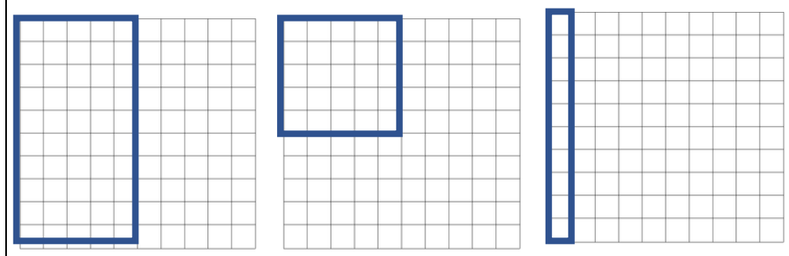
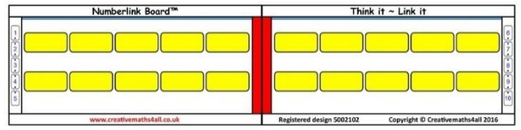
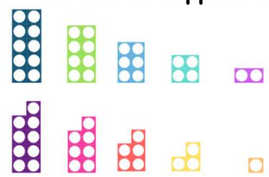
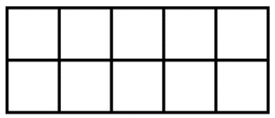
• I can calculate complements to 100 (54 + 46 = 100) • I can apply place-value knowledge to known additive and multiplicative number facts (scaling by 10)	**Visualisation:** • **Empty 100 square** to show how to share into equal groups 	 **Number lines** to show children equal intervals  **Numberlink boards** to show children the relationship of multiplication facts and to teach the 1, 10, 5 derive structure	• Not understanding equivalent decimals for example one tenth being the same value as ten hundredths
Domain: **Addition and Subtraction**			
Revision year 3: • I can manipulate the additive relationship in addition and understand the law of commutativity • I understand the related property for subtraction • I can understand the inverse relationship between addition and subtraction • I can use the part-part-whole structure to represent addition and subtraction calculations • I can identify properties of regular polygons and identify which lengths are equal	**New learning- KPIs:** • I can add and subtract 3-digit numbers using a column method (year 3) • **I can add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate** • **I can estimate and use inverse operations to check answers to a calculation** • **I can solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why** • I can find the perimeter of regular and irregular polygons • I can find the perimeter of regular shapes with some missing lengths by identifying which lengths of sides are equal	**Resources to support learning:**  **Numicon** can be used to support children to understand the law of commutativity   **Tens frames** with **place value counters** to support children to understand that 10 of something fit into	**Common misconceptions:** • Thinking that subtraction is commutative. The difference and subtrahend can swap places in a calculation and the calculation will still be accurate. However, this isn't showing the law of commutativity • In missing digit calculation, not understanding when and how to use the inverse operation • Understanding how to regroup when addition crosses place value columns • Knowing how to represent regrouping in a formal strategy and what the value of these digits represents

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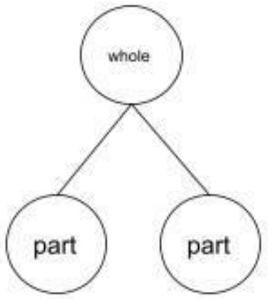
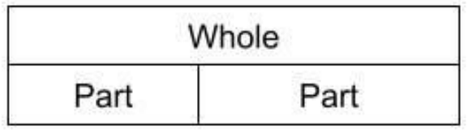
Visualisation:

- **Part whole model** to show partitioning in a standard and non-standard way
- **Bar model** to model the partitioning of numbers
- **Number line** to show partitioned addition or subtraction and to model the strategy of counting on or counting back
- **Perimeter** of 2D shapes as a context for addition problems
- **Money** as a real-life context for adding and subtracting (£ and p amounts **not decimal numbers**)
- **Measuring contexts** solving addition and subtraction problems involving measure (e.g. ml, l, cm, m, km, g, kg)

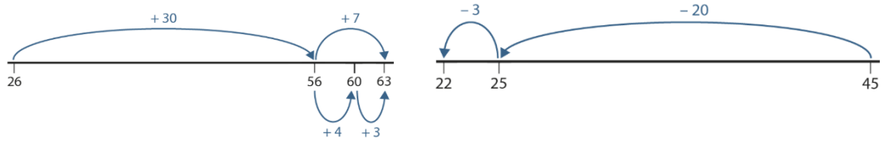


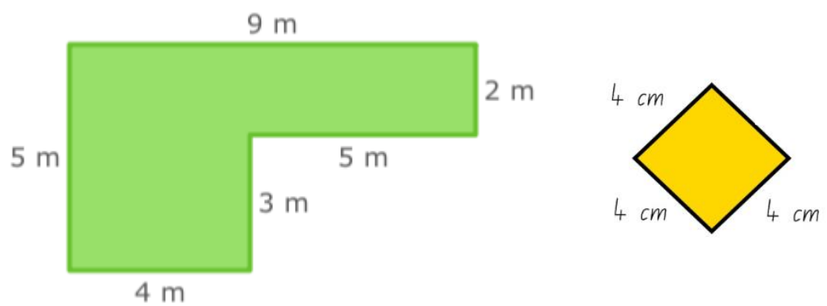
cherry diagram



Bar model

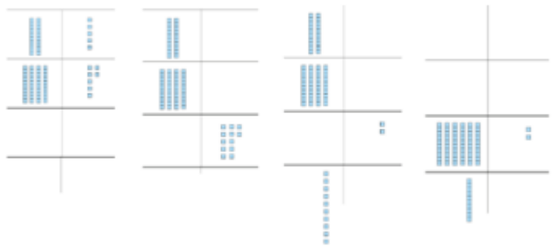
45 – 20 – 3 = 22



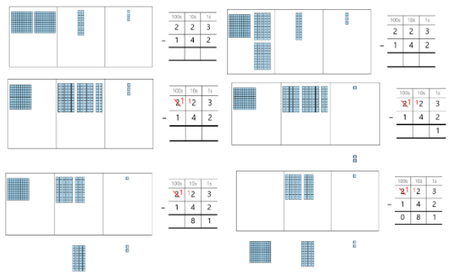


Dienes to show children the relationship between numbers and what 'ten times bigger' looks like

Place value counters and dienes to show the partitioning of two-digit and three-digit numbers



Dienes to model the strategy of regrouping and unitising in column addition (please see year 3 MTP for more detail)



Dienes to model the strategy of regrouping and unitising in column subtraction (please see year 3 MTP for more detail)

- Lining up the digits inaccurately and not adding the regrouping digits into the correct column
- Understanding 100p = £1
- Understanding how to regroup in subtraction in a formal method so that they don't subtract a value from the **subtrahend** instead of the **minuend**.

2 3 4 6 7 2 3 3	For example, taking 4 away from 7 and 3 away from 6

- Lining up the digits inaccurately and not adding the regrouping digits into the correct column
- Understanding 100p = £1

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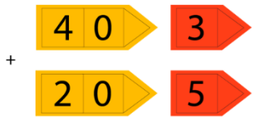
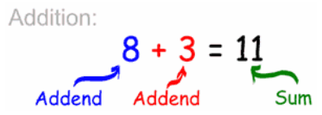
Number lines to show children the position of numbers including negative numbers and how to round to the nearest multiple of…

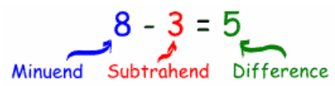


Place Value Arrow cards identify how digits change in addition and what this looks like when the number is blended back together

This domain may bridge across Phase 1 and Phase 2

Vocabulary:





add, addition, more, plus, make, sum, total, altogether, double, near double, one more, two more… ten more… one hundred more,
How many more to make…? How many more is… than…? How much more is…?
subtract, subtraction, take (away), minus, leave, difference, one less, two less… ten less… one hundred less
How many are left/left over how many fewer is… than…? How much less is…?
difference between, half, halve
equals, sign, is the same as
tens boundary, hundreds boundary, unitise

Phase 2

Domain: **Multiplication and division (number facts)**

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Revision year 3:

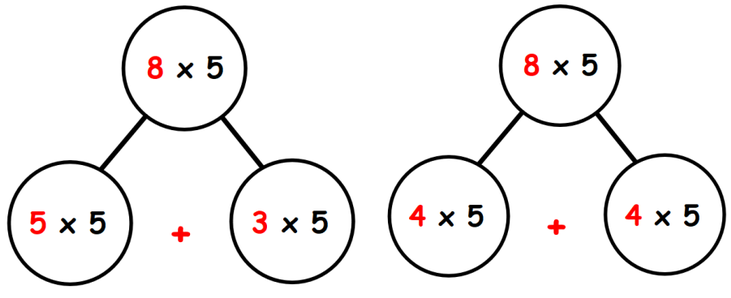
- I can double and halve any two-digit number
- **I can count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backwards**
- I can apply known multiplication and division facts to solve contextual problems with different structures including quotative and partitive division
- I can recall multiplication facts and corresponding division facts in the 10, 5, 2, 4 and 8 multiplication tables
- I can recognise products in these multiplication tables as multiples of the corresponding number
- I can apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10)
- I can apply the distributive law in order to find unknown multiples

New learning- KPIs:

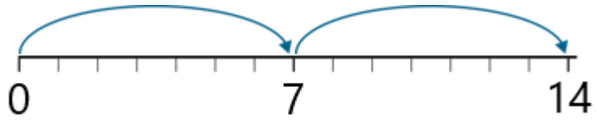
- I can recall multiplication and division facts up to 12 x 12 and recognise products in multiplication tables as multiples of the corresponding number.
- I can recall multiplication and division facts for my 3-, 6- and 9-times tables
- I can identify the relationship between the 5- and 10-times table families
- I can recognise the relationship between the 2-, 4- and 8-times table families
- I can recognise the relationship between the 3-, 6- and 9-times table families
- I can recall multiplication and division facts for the 7 times tables
- I can multiply and divide whole numbers by 10 and 100 and understand that this is the same as making something ten times or a hundred times the size
- I understand the law of commutativity and the distributive law and can manipulate multiplicative relationships using this understanding
-

Visualisation and context:

- **Part whole** to support with application of the **distributive** law
- **1, 10, 5 derive** to find unknown multiplication facts
- **Divisibility** rules within planning units
- **Finding the area** of regular polygons

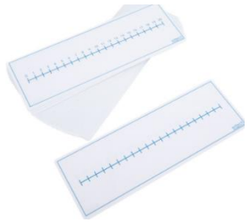


Resources to support learning:



Number lines to show skip counting

Times table flash cards/ playing cards for rapid recall games



Double sided number line whiteboards to show the relationship between multiplication families

Red and yellow counting stick to count up in multiples of and to help children identify patterns in times table families

Common misconceptions:

- Doubling 6 x table facts to find 9 times table facts (when using the 1, 10, 5 derive strategy)
- Knowing when you use the inverse operation in missing digit calculations
- Understanding the difference between factors and multiples and accurately using this terminology
- To make a number ten times bigger you add a 0

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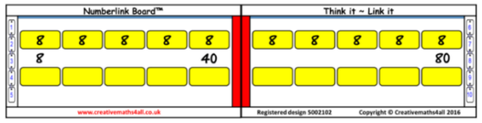
Divisibility rules in 'families' – 2, 4 and 8	
2	A number is divisible by 2 if the ones digit is even.
4	If halving a number gives an even value, then the number is divisible by 4. *and* For numbers with more than two digits: if the final two digits are divisible by 4 then the number is divisible by 4.
8	If halving a number twice gives an even value, the number is divisible by 8.

Divisibility rules in 'families' – 5 and 10	
5	A number is divisible by 5 if the ones digit is 5 or 0.
10	A number is divisible by 10 if the ones digit is 0.

Divisibility rules in 'families' – 3, 6 and 9	
3	For a number to be divisible by 3, the sum of the digits of the number must be divisible by 3.
6	For a number to be divisible by 6, the number must be divisible by *both* 2 *and* 3.
9	For a number to be divisible by 9, the sum of the digits of the number must be divisible by 9.

Magnetic bar model set to show how many equal groups fit into a whole

Sliding place value charts when teaching how numbers change when multiplying and dividing by powers of 10



Numberlink boards to make connections between multiplication families

Domain: **Multiplication (grid method for up to 3-digit by 1-digit)**

Revision year 3:

- **Write and calculate mathematical statements for x and ÷ using the multiplication tables that are known, including 2-digit x 1-digit using both mental and formal written method**

Visualisation and context:

- I can multiply a 3-digit number with a 1-digit number using the distributive law
- **I can multiply together 3 numbers**
- **I can recognise and use factor pairs and commutativity in mental calculations**

Resources to support learning:

Place value counters for children who need to build arrays or to show 'groups of' in division

Common misconceptions:

- Understanding that multiplication using a formal strategy requires unitising 4 x 3, 4 x 3 tens, 4 x 6 hundreds, 4 x 8 thousands
- When using the grid method, forgetting to add up the products found

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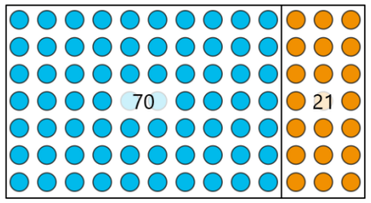
- **Solves problems involving missing number problems, involving multiplication and division including integer scaling problems and corresponding problems in which n objects are connected to m objects**

Visualisation and context:

- **Partitioned array** into the **grid method**
- **Dienes** to show 'groups of' in multiplication problems
- **Place value counters** to arrays for multiplication to model the **distributive** law

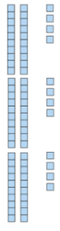


70	21

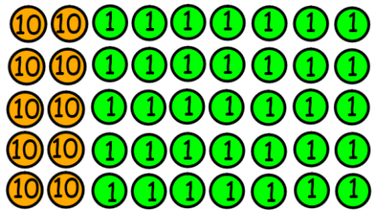
x	10	3
7	70	21

x	200	40	2
7	1400	280	14

3 rows, each with 24 chairs. How many chairs altogether?



24 × 3 = 20 × 3 + 4 × 3



Place value counters for children to build long multiplication arrays and to apply the distributive law

Dienes to model the strategy of regrouping and unitising in column addition (please see year 3 MTP for more detail)

Domain: **Division**

Revision year 3:

- I can apply known multiplication and division facts to solve contextual problems with different structures including quotative and partitive division

New learning- KPIs:

- I can solve division problems with 2-digit dividends and 1-digit divisors
- I can solve division problems with 2-digit dividends and 1-digit divisors that involve remainders

Resources to support learning:

Common misconceptions:

- To make a number ten times smaller you take away a 0
- Reading a calculation with the divisor divided by the dividend for example 3 ÷ 3663 instead of 3663 ÷ 3

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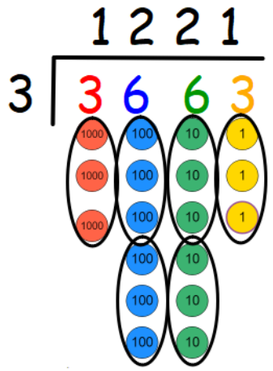
- I can recall multiplication facts and corresponding division facts in the 10, 5, 2, 4 and 8 multiplication tables
- I can recognise products in these multiplication tables as multiples of the corresponding number
- I can apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10)
- I can apply the distributive law in order to find unknown multiples

Visualisation and context:

- **Place value counters** to show groupings when using bus stop method



Magnetic bar model set to show how many equal groups fit into a whole

Red and yellow counting stick to count up in multiples of and to help children identify patterns in times table families

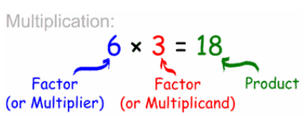
Place value counters for children who need to build arrays or to show 'groups of' in division

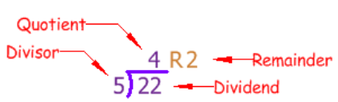
Sliding place value charts when teaching how numbers change when multiplying and dividing by powers of 10

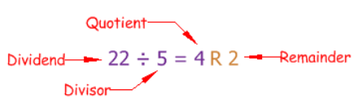
- Thinking that division is commutative. Although the quotient and divisor can swap places in a calculation, for example 15 ÷ 3 = 5 or 15 ÷ 5 = 3, this is not the law of commutativity

Vocabulary

lots of, groups of, , times, multiply, multiplication, multiplied by, multiple of, product
once, twice, three times… ten times…times as (big, long, wide… and so on),repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each…group in pairs, threes… tens, equal groups of, , divide, division, divided by, divided into, left, left over, remainder







Phase 3

Domain: **Fractions**

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Revision year 3:

- I can interpret and write proper fractions to represent 1 or several parts of a whole that has been divided into equal parts
- I can find unit fractions of quantities using known division facts (and multiplication tables fluency)
- I can interpret and write proper fractions to represent 1 or several of a whole that has been divided into equal parts
- I can reason about the position of any fraction within 1 in the linear number system
- I can add and subtract fractions with the same denominator within 1

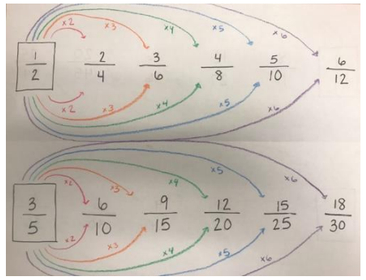
- **I can recognise and shows, using diagrams, equivalent fractions with small denominators**
- **Recognises, finds and writes fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators**
- **Counts up and down in tenths: recognises that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10**

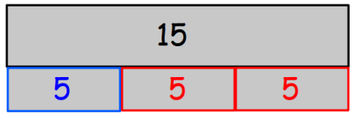
New learning- KPIs:

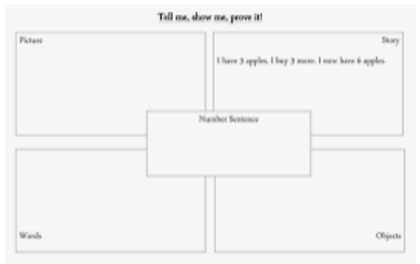
- I can interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts
- I can reason about the position of mixed numbers in a linear number system
- I can convert mixed numbers to improper fractions and vice versa
- I can add and subtract fractions with the same denominator
- I can add and subtract improper and mixed fractions with the same denominator including bridging through a whole number
- **I can compare and order fractions when the denominator is the same**

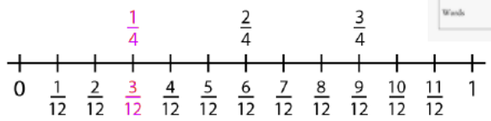
Visualisation and context:

- **Fraction rainbows** to show how to find equivalent fractions
- **Explain**, **make** and **prove** it grids
- **Bar model** to show fractions of amount
- **Double number lines** to show equivalent fractions

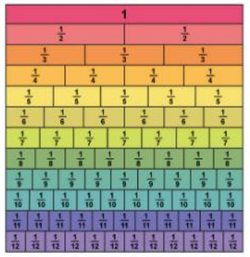








Resources to support learning:



Fraction walls to identify equivalent fractions

Cuisenaire rods to identify and build fraction families

Fraction dice to support in lessons when identifying fractions of amount and the relationship between denominators

Pattern blocks to support with teaching equivalent fractions

Red and yellow counters to teach fractions of amount

Misconceptions:

- When you add and subtract fractions with different denominators, adding or subtraction both the numerator and denominator (without finding a common denominator)
- The larger the denominator the larger the fraction because the digit on the bottom has a larger cardinal value

• **Compares and orders unit fractions with the same denominators** • **Add and subtract fractions with the same denominator within one whole** • **Solves problems involving understanding of fractions**			

Vocabulary:
Equivalent, Numerator, Denominator
part, equal parts, fraction, one whole, one half, two halves
one quarter, two… three… four quarters, one third, two thirds, three thirds, one tenth

Domain: Geometry

Revision from year 3:	**New learning- KPIs:**	**Resources to support learning:**	**Misconceptions:**
• I can recognise right angles as a property of shapes or a description of a turn • I can identify right angles in 2D shapes presented in different orientations • I can draw polygons by joining marked points • I can identify parallel and perpendicular sides in a shape	• I can identify lines of symmetry in 2D shapes presented in different orientations • I can reflect shapes in a line of symmetry • I can complete a symmetrical figure or pattern with respect to a specific line of symmetry • I can identify parallel and perpendicular lines • **I can compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes** • **I can identify acute and obtuse angles and compare and order angles up to two right angles by size** • **I can name and describe properties of 3D shapes**	 **Folding plastic geometric shapes** to support children with classification of 3D shapes and to understand nets	• Confusion between vertex, vertices, edges and faces • Lines aren't parallel if they are not straight 

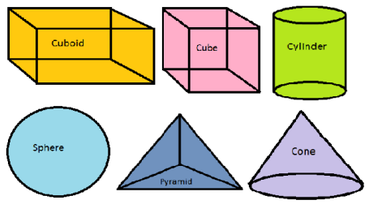
Maths Year 4 Curriculum

Bold – National Curriculum objectives
Not bold- Ready to Progress document

- **I recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identifies whether angles are greater than or less than a right angle**
- **Recognises angles as a property of a shape or a description of a turn**
- **Identifies horizontal and vertical lines and pairs of perpendicular and parallel lines**
  - **Draws shapes and makes 3D shapes using modelling materials; recognises 3D shapes in different orientations and describes them.**

Visualisation and context:

- **Angle family** to support with identifying different types of angles in shapes
- **2D images** of 3D shapes to support with classification and description of 3D shapes



Mirrors to identify lines of symmetry

Domain: Coordinates

Revision from year 3:

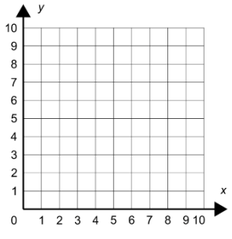
- I can recognise right angles as a property of shapes or a description of a turn
- I can identify right angles in 2D shapes presented in different orientations
- I can draw polygons by joining marked points
- I can identify parallel and perpendicular sides in a shape

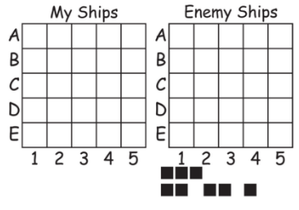
New learning- KPIs:

- I can draw polygons, specified by coordinates in the first quadrant
- I can translate shapes on a coordinate grid within the first quadrant

Visualisation and context:

- **One quadrant grid** when reading and plotting coordinates
- **Battleships** empty game grid





Resources to support learning:

Connect four to practise reading coordinates

Treasure map to practise reading and plotting coordinates

Misconceptions:
Reading and writing the order of coordinates incorrectly- writing the y axis coordinate number before the x axis coordinate

Domain: Time

Maths Year 4 Curriculum

Bold – National Curriculum objectives
Not bold- Ready to Progress document

Revision from year 3:

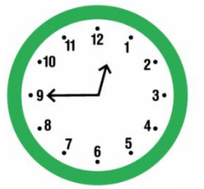
- **Interprets and presents data using bar charts, pictograms and tables**
- **Solves one and two step questions using information presented in scaled bar charts and pictograms and tables**
- **Tells and writes the time from an analogue clock and 12-hour and 24-hour clocks**
- **To compare durations of events, for example to calculate the time taken for particular events or tasks**

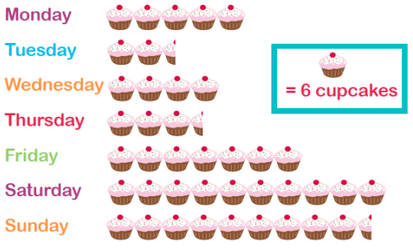
New learning-KPIs:

- **I can interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs**
- **I can solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.**
- **I can read, write and convert time between analogue and digital 12- and 24-hour clocks**
- **I can solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days**

Visualisation and context:

- **Pictograms**
- **Calendars**
- **12- and 24-hour clocks**





Resources to support learning:

Plastic clocks to teach children how to read the time

Number lines with intervals of 5 to 60 to represent the 12-hour clock as a more familiar number line structure

Misconceptions:

- Reading the time and confusing the minute and hour hand
- Reading the coordinates on a graph incorrectly – reading the y coordinate before the x coordinate
- Knowing half a picture on a pictogram represents half of the amount