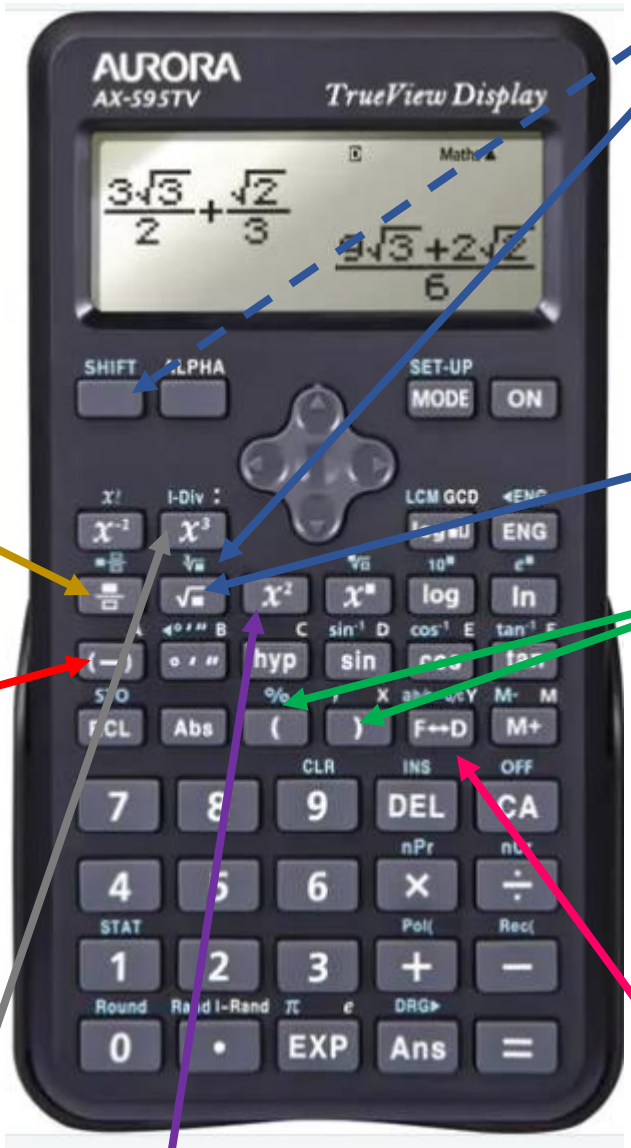
‘Use of a scientific calculator’

The Knowledge for Progression:

Speak Like a Mathematician:



Cube root button

(Press ‘*SHIFT*’ then this button)

Square root button

Fraction button

Brackets

Negative button

Cube button

Square button

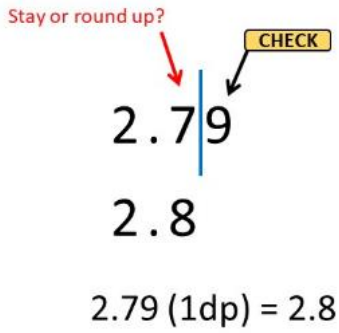
Fraction to decimal button

‘Rounding’

The Knowledge for Progression:

- To know that we round to make a number simpler whilst keeping its value close to what it was.

Speak Like a Mathematician

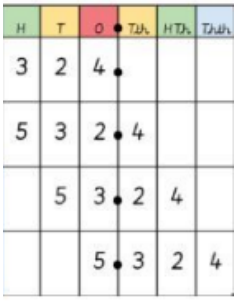
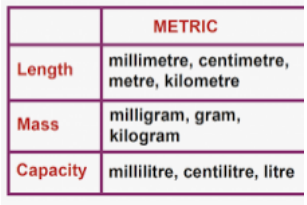
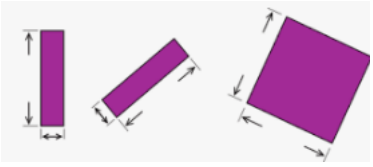
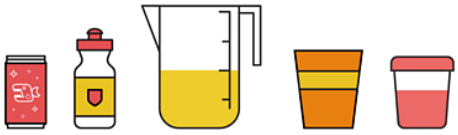
Key Word	Dual Coding	Definition
Rounding		The process of simplifying a number whilst maintaining a value close to the original number

‘Multiplications and division by powers of 10 and converting units’

The Knowledge for Progression:

- To know that multiplying by powers of 10 increases the place value of each digit.
- To know that dividing by powers of 10 decreases the place value of each digit.
- To know that 1cm = 10mm.
- To know that 1m = 100cm.
- To know that 1km = 1000m.
- To know that 1kg = 1000g.
- To know that 1litre = 1000ml.

Speak Like a Mathematician

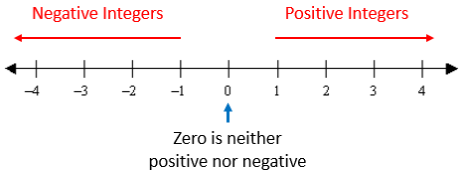
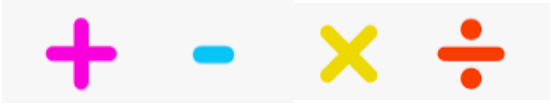
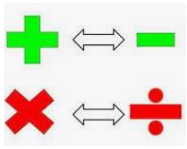
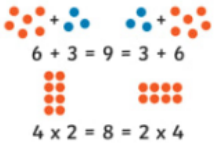
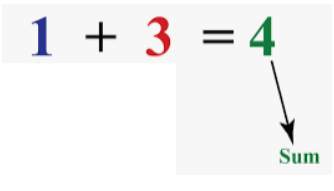
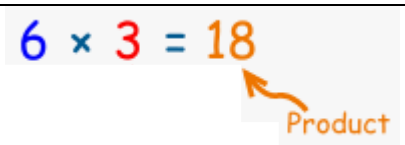
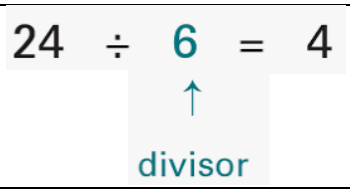
Key Word	Dual Coding	Definition
Place Value		The value of a digit based on its position or place in a number
Metric		Use of measurement based on multiples of 10
Length		The distance between two points
Mass		How heavy an object is
Capacity		The amount of liquid or air an object can hold

‘Developing number sense’

The Knowledge for Progression:

- To know that when adding or subtracting values the place value of the digits must be lined up.

Speak Like a Mathematician

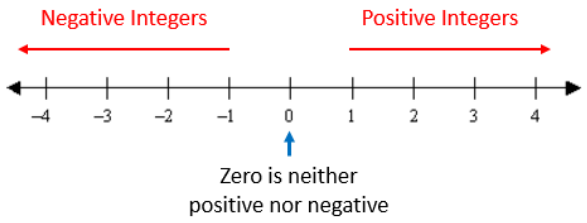
Key Word	Dual Coding	Definition
Integer		Any whole number
Operations		Addition, subtraction, multiplication, and division are the four operations
Inverse		The opposite operation
Commutative		Changing the order of the operations does not change the result
Difference		Subtract the smallest value from the biggest value
Sum		The result of adding values together
Product		The result of multiplying values together
Divisor		The value that you are dividing by

‘Ordering, comparing and representing values’

The Knowledge for Progression:

- To know that a negative number is less than 0.
- To know that ‘=’ means equals/the same as.
- To know that ‘≠’ means not equal to/not the same as.
- To know that ‘>’ means greater than.
- To know that ‘<’ means less than.
- To know that ‘≥’ means greater than or equal to.
- To know that ‘≤’ means less than or equal to.
- To know that ‘>’ and ‘<’ are represented by O on a number line.
- To know that ‘≥’ and ‘≤’ are represented by ● on a number line.

Speak Like a Mathematician

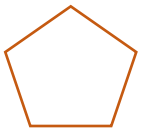
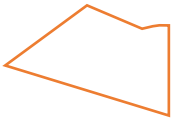
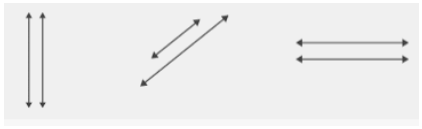
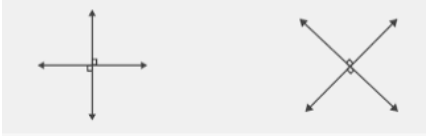
Key Word	Dual Coding	Definition
Integer		A positive or negative whole number
Ascending		The smallest value to biggest value
Descending		The biggest value to the smallest value

‘Properties of 2D shapes’

The Knowledge for Progression:

- To know that >> notates parallel lines.
- To know that | notates lines of the same length.
- To know that parallel lines are the same distance apart and so never meet.
- To know that perpendicular lines meet at 90 degrees.

Speak Like a Mathematician

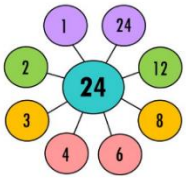
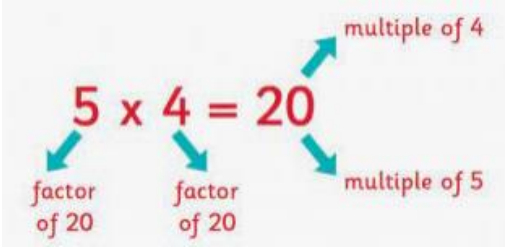
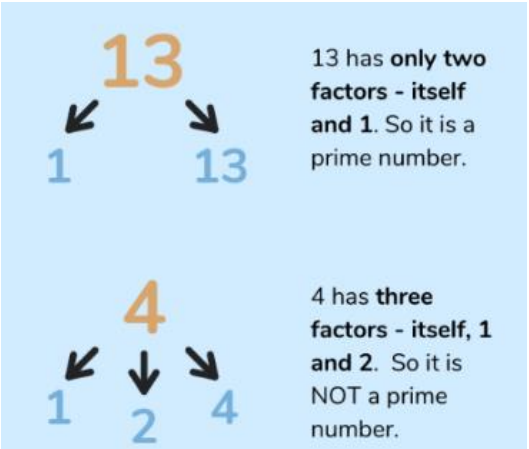
Key Word	Dual Coding	Definition
Polygon		A 2D shape made with straight lines - all sides are connected
Regular		All inside angles and side lengths are equal
Irregular		Irregular shapes have side lengths and angles of any size or length
Quadrilateral		A four-sided shape
Parallel		Two lines that are the same distance apart and so will never meet
Perpendicular		Lines that meet at a 90° angle

‘Factors, multiples, and primes’

The Knowledge for Progression:

- To know that a multiple is a repeated multiplication of a value.
- To know that the lowest common multiple (LCM) is the lowest multiple that is common in two or more values.
- To know that a factor is a value that divides without a remainder.
- To know that the highest common factor (HCF) is the highest factor that is common in two or more value.
- To know that a prime number is an integer with only two factors, one and itself.
- To know the prime numbers up to 19.
- To know that prime factor decomposition is expressing any number as a product of its prime factors.

Speak Like a Mathematician

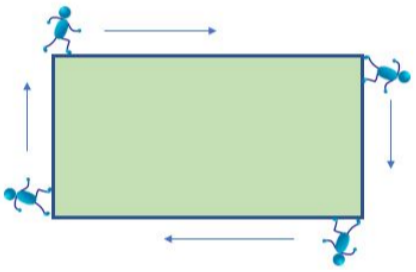
Key Word	Dual Coding	Definition
Factor		A value that divides without remainder
Multiple		Repeated multiplication of a value
Prime		An integer with only two factors, one and itself

‘Perimeter’

The Knowledge for Progression:

- To know that the perimeter is the sum of the lengths around a 2D shape.
- To know that lengths are measured in linear units.

Speak Like a Mathematician

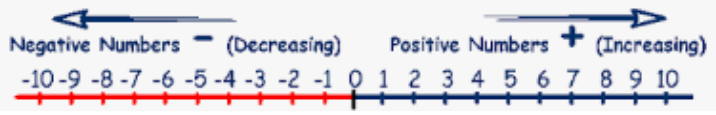
Key Word	Dual Coding	Definition
Perimeter		The sum of the lengths around a 2D shape.

‘Calculating with negative numbers’

The Knowledge for Progression:

- To know that a negative number is a value less than 0.
- To know that adding positives increases the value.
- To know that subtracting positives decreases the value.
- To know that adding negatives decrease the value.
- To know that subtracting negatives increases the value.
- To know that negative values need to have brackets around them when using a calculator.

Speak Like a Mathematician

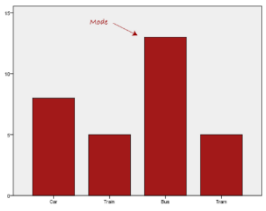
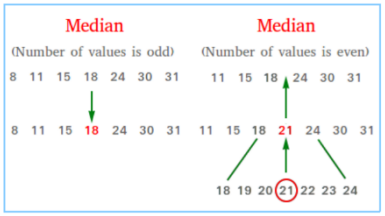
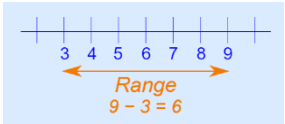
Key Word	Dual Coding	Definition
Negative		A value below zero.

‘Averages and range’:

The Knowledge for Progression:

- To know that the mode/modal means the most common item of data (this does not need to be numerical).
- To know that the median is the middle item of ordered numerical data.
- To know that the mean is the sum of quantities in a data set divided by the total number of quantities in the set.
- To know that the range is a measure of spread. It is the difference between the largest and smallest items of numerical data.

Speak Like a Mathematician

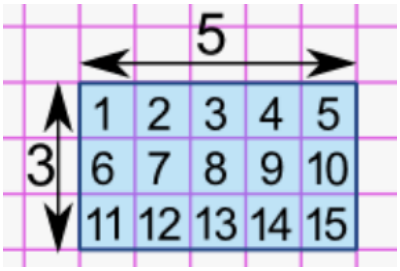
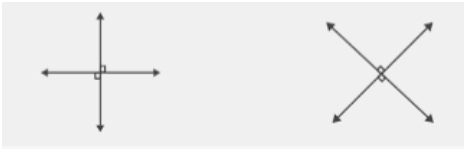
Key Word	Dual Coding	Definition
Mode		The most common item of data.
Median		The middle item in ordered numerical data.
Mean	$7 + 4 + 5 + 3 + 4 + 7 = 30$ There are 6 quantities The sum of quantities $30 \div 6 = 5$ **The mean = 5**	The sum of quantities in a data set divided by the total number of quantities in the set.
Range		A measure of spread.

‘Area’

The Knowledge for Progression:

- To know that area is the number of square units inside a 2D shape.
- To know that area is measured in square units e.g. mm^2, cm^2, m^2.
- To know that the perpendicular height is the height that meets the base at a 90° angle.
- To know that the area of a square, rectangle, rhombus and parallelogram is $base \times perpendicular\ height$.
- To know that the area of a triangle is $\frac{Base \times perpendicular\ height}{2}$.

Speak Like a Mathematician

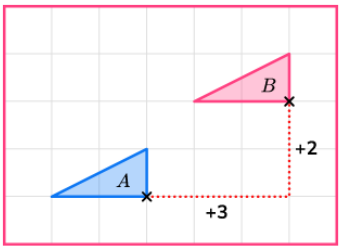
Key Word	Dual Coding	Definition
Area		The number of square units inside a 2D shape.
Perpendicular height		The line that meets the base at a 90° angle.

‘Translations’

The Knowledge for Progression:

- To know that a translation is horizontal and vertical movement of a shape.
- To know that a column vector describes a movement.
- To know that the top value of a column vector represents the horizontal movement.
- To know that the bottom value of a column vector represents the vertical movement.
- To know that movements up and right are represented by a positive value.
- To know that movements down and left are represented by a negative value.

Speak Like a Mathematician

Key Word	Dual Coding	Definition
Translate		To translate means to move every point of a object in the same direction
Column vector	$\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ is $\begin{pmatrix} 3\ right \\ 2\ up \end{pmatrix}$	Describes the movement of a translation