Mathematics Knowledge Organiser

Year 7 – Autumn T1

‘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

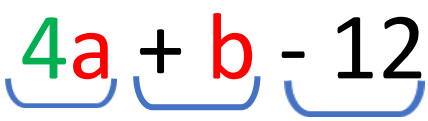
Key Word	Dual Coding	Definition
Negative		A value below zero.

‘Algebraic manipulation’

The Knowledge for Progression:

- To know that terms are a constant, variable or combination of both and can be positive or negative. The 4 operations can be applied in exactly the same way as numerical operations.
- To know that like terms are the same variables raised to the same power.
- To know that expanding means the removal of brackets by multiplication.
- To know that an expression is made up of constants, variables and mathematical operations, but does not include an = sign.
- To know that substitution means replacing the variables in an algebraic expression with their numerical values.

Speak Like a Mathematician

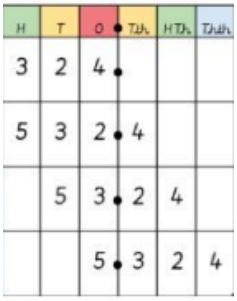
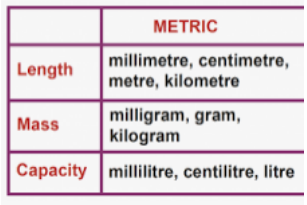
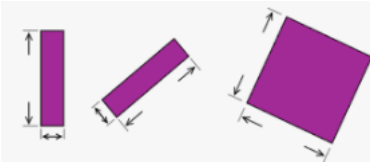
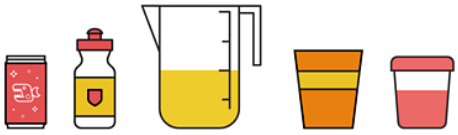
Key Word	Dual Coding	Definition
Variable		A letter or a symbol representing a numerical value
Coefficient		A numerical value that comes before a variable
Term		A constant, variable or combination of both
Like terms	$3c + 2d - c + 5d + 4c^2$	The same variables raised to the same power
Expression	4a + b - 12	Made up of constants, variables, and mathematical operations
Expand		The removal of brackets by multiplying
Substitution	When a = 4 work out 3 + a 3 + 4 = 7	Replacing variables with numerical values

‘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.

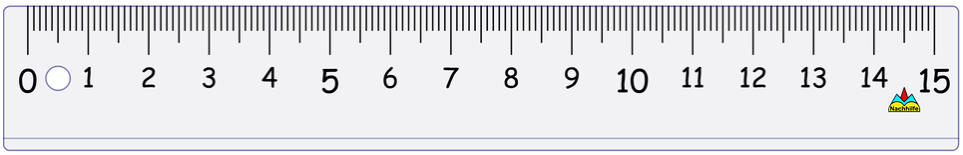
Speak Like a Mathematician

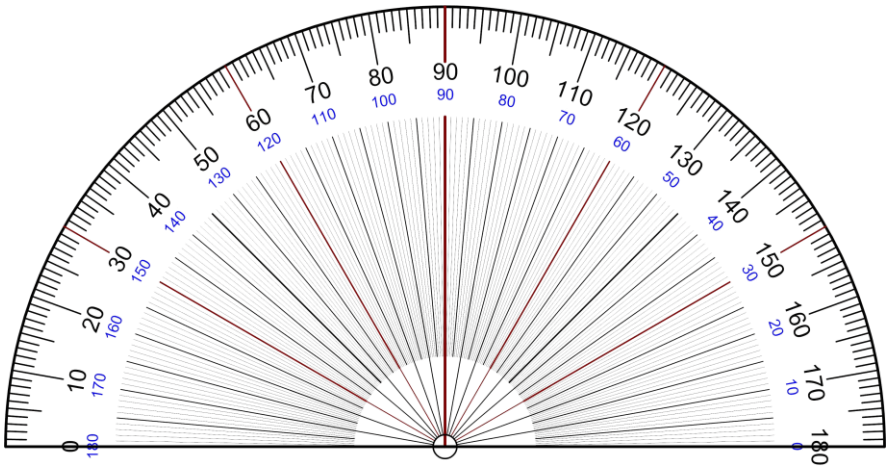
Key Word	Dual Coding	Definition
Place Value		The value of a digit based on its position or place in a number
Metric		Use of measurement based on multiples of 10
Length		The distance between two points
Mass		How heavy an object is
Capacity		The amount of liquid or air an object can hold

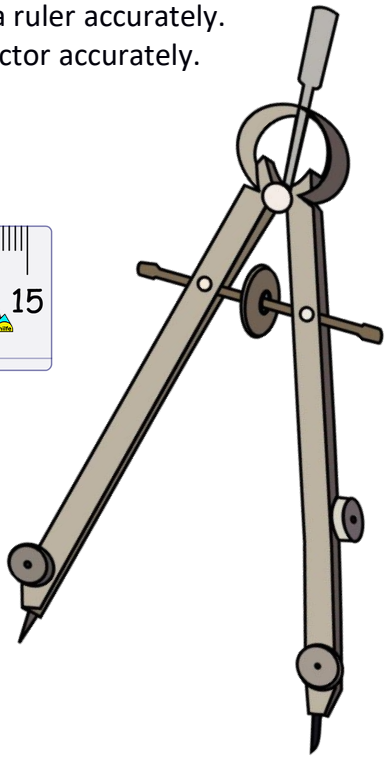
‘Constructions’

The Knowledge for Progression:

- To know how to measure and draw line segments with a ruler accurately.
- To know how to measure and draw angles with a protractor accurately.
- To know how to use a compass accurately.





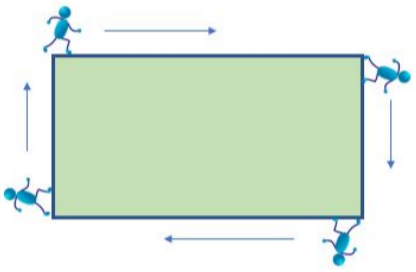


‘Perimeter’

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.

Mathematics Knowledge Organiser

Year 7 – Autumn T2

‘Rounding and estimating’

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
Round		Making a number simpler but keeping the value close to what it was

‘Order of operations’

The Knowledge for Progression:

- To know the order of the operations is the order in which different mathematical operations are applied in a calculation.
- To know that division and multiplication hold the same value and you work them out in the order they appear.
- To know that addition and subtraction hold the same value and you work them out in the order they appear in the question.

Speak Like a Mathematician

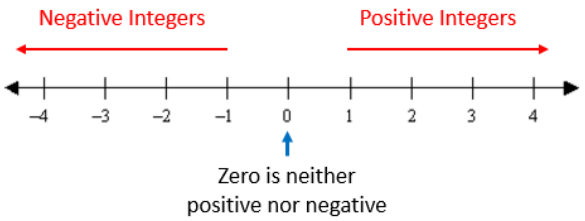
Key Word	Dual Coding	Definition
Order of operations		The order in which different mathematical operations are applied in a calculation.

‘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

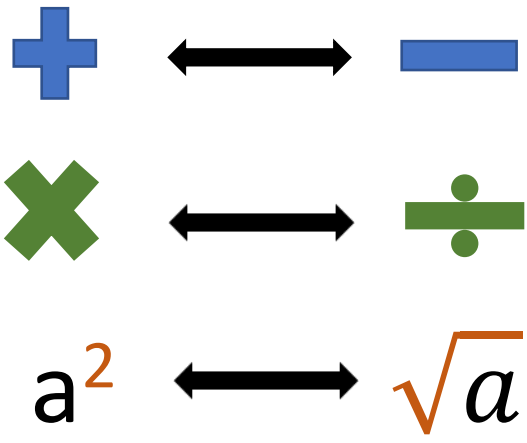
Key Word	Dual Coding	Definition
Integer		A positive or negative whole number
Ascending		The smallest value to biggest value
Descending		The biggest value to the smallest value

‘Solving equations and inequalities’

The Knowledge for Progression:

- To know that an equation contains an equals symbol, variable and constant.
- To know that an inequality contains an inequality symbol, variable and constant.
- To know that equation/inequality are formed from expressions.
- To know that solve means to find the value of the variable.
- To know that solving always requires performing the inverse operations.

Speak Like a Mathematician

Key Word	Dual Coding	Definition
Equation	$4a + b - 12 = 32$	Two expressions connected by an equal symbol
Inequality	$4a + b - 12 > 32$	Two expressions connected by an inequality symbol
Solve	$\frac{x}{5} = 6$ $x = 30$	Find the value of the variable
Inverse		Opposite operations that reverse the effect of the other operation