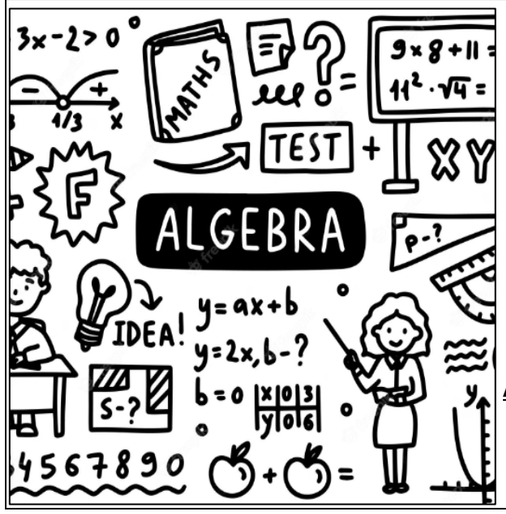
ALGEBRA

Year 6

KNOWLEDGE ORGANISER

Overview



Algebra we learn:

-1-Step Function Machines -2-Step Function Machines

-Form Expressions -Substitutions

-Find Pairs of Values -Form Equations

-Solve 1-Step Equations -Solve 2-Step Equations

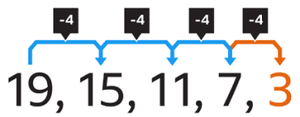
-Formulae -Solve Problems with Two Unknowns

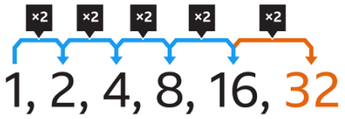
Definition of Algebra

Algebra is the part of maths in which letters and symbols are used to represent numbers and formulae. Letters such as 'x' are used in place of values that we don't know (the variable). Algebra follows special rules.

Linear Number Sequences/ Enumerating

In a **linear number sequence**, the value increases or decreases by the same amount every time. This constant change is known as the term-to-term rule.





When you know the term-to-term rule, you can use it to find other values in the number sequence.

Enumerating means finding all of the possible answers to a problem. We can use a range of strategies, e.g. creating organised lists or tables, to find all of the possibilities.

e.g. customers can choose two ingredients to go in their omelette. How many possibilities are there?

-Cheese and pepper -Pepper and spinach

-Cheese and spinach -Spinach and mushroom

-Cheese and mushroom -Pepper and mushroom

Answer: There are six possibilities in total.

Expressions and Equations

Expressions

An expression is a group of letters, symbols and operation symbols.

a + 16	-Add 16 to a
b – 2	-Subtract 2 from b
8c	-Multiply c by 8
d ÷ 5	-Divide d by 5
4e + 7	-Multiply e by 4, then add 7

Expressions are a set of terms combined using the operations +, -, x or ÷

Expressions don't tell us the outcome of the operation or what the operation is equal to.

Equations

An equation contains an equals sign (=). Expressions on either side of the equals sign hold an equal value.

a + 16 = 22	Therefore a = 6
b – 2 = 8	Therefore b = 10
8c = 32	Therefore c = 4
d ÷ 5 = 20	Therefore d = 100
4e + 7 = 27	Therefore e = 20

We can often solve equations through using the inverse.

If a + 16 = 22, then 22 – 16 = a

If 4e + 7 = 27, then 27 – 7 = 20. 20÷4 = e

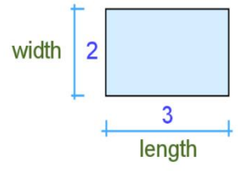
Formulae and Pairs of Unknowns

Formulae (the plural 'formulas' is also correct).

A formula is a type of equation which shows us the relationship between different variables. We often use formulas in geometry and in physics.

Area of a rectangle = length x width

Area of a triangle = (base x height) ÷ 2



Area = length x width

Solving Equations with Pairs of Unknowns

In equations in which there are two variables, there may be several possible values for the unknown amounts that could balance the equation.

a	b
1	6
2	4
3	2
4	0

The example on the right shows the possible values of the unknowns *a* and *b* in 2a+b=8

Key Vocabulary

Variable | Unknown | Expression | Equation | Formula | One-Step/ Two-Step | Substitution | Enumeration | Term-to-Term Rule