## Number facts:

**Negative numbers:**
When multiplying and dividing,
Two like signs make a positive
answer and two unlike signs
make a negative answer.

"Like Signs"  "Unlike Signs"

When adding and subtracting, unlike signs become a subtraction, and like signs become an addition.

**Metric units:**
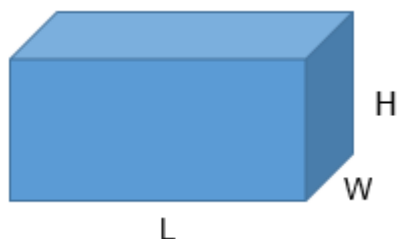
| Unit | Number |
|------|--------|
| Mega (M) | 1,000,000 |
| Kilo (k) | 1,000 |
| Centi (c) | 0.01 |
| Milli (m) | 0.001 |
| Micro ($\mu$) | 0.000001 |

1km = 1000m    1kg = 1000g
1m = 100cm     1l = 1000ml
1cm = 10mm     1ml = 1cm$^3$

## Geometry

Volume of a cuboid = L x W x H

Calculate the volume of a cuboid with length 6cm, width 2.5cm and height 4cm.
Volume = 6 x 2.5 x 4 = <u>60cm$^3$</u>
Volume is always measured in units cubed.
e.g mm$^3$ , km$^3$ , m$^3$

## Algebra facts:

**Simplifying expressions:**
Multiplication signs are not normally used in algebra, so:
$6 \times a \times b = 6ab$
$a + a + a + a + a = 5a$
We can simplify expressions that are added and subtracted by **collecting like terms**. Like terms are terms which have exactly the same variable:
$3a + 2b - a + 4b = 2a + 6b$
When we multiply terms, we need to use **indices**
$a \times a \times a \times a \times a = a^5$
**Laws of indices**: When multiplying you add the indices, and when dividing you subtract the indices:
$p^3 \times p^7 = p^{10}$ and $s^5 \div s^3 = s^2$
**Solving equations:**
To solve means to find the value of the unknown.

|       | 5x – 3 = 17 |       |
|-------|-------------|-------|
| +3    | 5x    = 20  | +3    |
| ÷5    | <u>x     = 4</u>  | ÷5    |

## Rounding:

Decide which is the last digit to **keep**
Leave it the same if the **next digit** is less than 5
But increase it by 1 if the next digit is 5 or more

**Decimals places**: to round to "so many decimal places" count that many digits from the decimal point
**Significant figures**: to round to "so many" significant digits, count digits from left to right, and then round off from there.

## Statistics & probability:

**Mutually exclusive events** can't happen at the same time. (e.g tossing a coin: Heads and Tails are mutually exclusive)
The sum of the probabilities for mutually exclusive outcomes is always 1.
**Correlation:** Scatter graphs show the relationship between two things (variables). This is called their correlation.
**Positive** correlation means that as one variable increases, so does the other.
**Negative** correlation means that as one variable increases, the other decreases
**No** correlation means that the variables do not affect each other.

Positive correlation    Negative correlation    No correlation
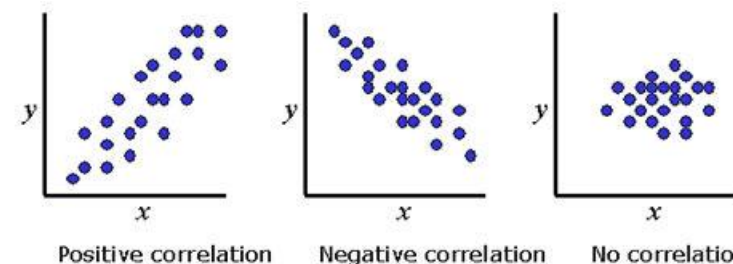
## Key words & definitions:

**Variable:** a symbol like x or V that stands in for a number we don't know yet.
**Expression:** numbers, symbols and operators (such as + and -) grouped together that show the value of something.
**Equation**: says that two things are equal. It has an equals sign (e.g. x + 3 = 5, 2a – 4 = 12)
**Formula:** a special type of equation that shows the relationship between different variables.
**Identity:** an equation that is true no matter what values are chosen.