My mathematical journey

What do I need to remember from before?

Place value, multiplication and division by powers of 10 (NP1)

Operations (NP2, NP3, NP4)

Laws of indices (NP5)

What will I learn about in this unit?

Writing large and small numbers in standard form.

Calculating with numbers in standard form.

Where does this lead?

Compound units (NP13)

Index laws (NP15)

Exponential growth (NP16)

You will apply this knowledge in Physics, Chemistry and Biology

Key words and symbols: what I need to say and write accurately

Numbers in standard form look like this.

$$x \times 10^{n}$$

$1 \leq x < 10$

n is an integer

The power of 10 tells us how many place value columns up or down to move.

e.g. 123 000 = $\mathbf{1.23 \times 10^{5}}$

0.000 012 3 = $\mathbf{1.23 \times 10^{-5}}$

Fingertip facts: what I need to learn by heart

Prefixes for SI units

Standard form	Amount	Prefix	Symbol
1×10^{12}	1 000 000 000 000	tera	T
1×10^{9}	1 000 000 000	giga	G
1×10^{6}	1 000 000	mega	M
1×10^{3}	1 000	kilo	k
1×10^{2}	100	hecto	h
1×10^{1}	10	deca	da
1×10^{0}	1		
1×10^{-1}	0.1	deci	d
1×10^{-2}	0.01	centi	c
1×10^{-3}	0.001	milli	m
1×10^{-6}	0.000001	micro	μ
1×10^{-9}	0.000000001	nano	n
1×10^{-12}	0.000000000001	pico	p

My mathematical journey

What do I need to remember from before?

Percentage multipliers (NP8, NP10)

Proportional reasoning (NP10)

Cartesian graphs (A6, A9, A10)

Manipulating algebra (A5, A10)

What will I learn about in this unit?

Reverse percentages

Simple interest

Direct and inverse proportion

Compound units

Combining ratios

Where does this lead?

Compound interest (NP16)

Proportion with squares, cubes and roots (NP16)

Instantaneous and average rates of change (A16)

Areas under graphs (A16)

Key words and symbols: what I need to say and write accurately

Word	Explanation
p.a.	*per annum*, Latin for "*every year*"
direct proportion	as one amount increases, the other increases at the same rate
k	the constant of proportionality, which is the rate of change
$\propto$	*is proportional to*
inverse proportion	as one amount increases, the other *decreases* at the same rate
density	a measure of how spread out particles in an object are
pressure	a measure of how spread out a force is
speed	a measure of distance per unit of time
compound units	a measure combining two other measures

Fingertip facts: what I need to learn by heart

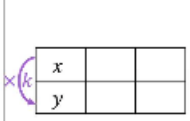
To calculate a percentage: $\textbf{original} \times \textbf{multiplier} = \textbf{new}$

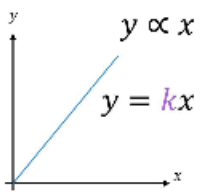
To return to the original whole: $\textbf{original} = \frac{\textbf{new}}{\textbf{multiplier}}$

Direct Proportion

As one increases, the other increases at the same rate.

y is proportional to x

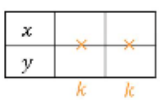


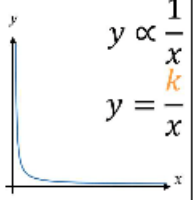


Inverse Proportion

As one increases, the other decreases at the same rate.

y is proportional to the reciprocal of x





$\text{Density} = \frac{\text{mass}}{\text{volume}}$ $\quad$ $\text{Pressure} = \frac{\text{force}}{\text{area}}$ $\quad$ $\text{Speed} = \frac{\text{distance}}{\text{time}}$