

SUBJECT: Maths

UNIT:

Year 9 Number

SANDHILL VIEW
EST. 1953



ACHIEVE · ASPIRE · ENJOY

Key Concept Indices

$10^3 = 10 \times 10 \times 10$
This means 10 cubed
= 1000

$10^2 = 10 \times 10 = 100$

The inverse of these
would be

$\sqrt{9}$ = square root of 9
= 3

Or cube root $\sqrt[3]{27} = 3$

Examples

Write the following in **standard form**:

- 1) $3000 = 3 \times 10^3$
- 2) $4580000 = 4.58 \times 10^6$
- 3) $0.0006 = 6 \times 10^{-4}$
- 4) $0.00845 = 8.45 \times 10^{-3}$

Key Concepts

Rounding

Digits are the individual components of a number.

Integers are whole numbers.

Rounding rules:

A value of 5 to 9 rounds the number up.

A value of 0 to 4 keeps the number the same.

Key Words

Estimate: Round each value to 1 significant figure, then complete the calculation using the rounded values.

Multiplier: A percentage wrote as a decimal, which can then be multiplied by an amount.

Integer: A whole number, a number with no decimal or parts of.

Key Concept

FDP

A **fraction** is a numerical quantity that is not a whole number.

A **decimal** is a number written using a system of counting based on the number 10.

Thousands
Hundreds
Tens
Ones
Tenths
Hundredths
Thousandths

8 7 6 5 . 4 3 2

A **percentage** is an amount out of 100.

Key Concept

Percentages

Calculating percentages of an amount without a calculator:

10% = divide the value by 10

1% = divide the value by 100

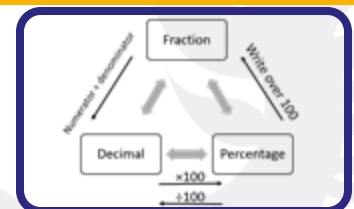
Calculating percentages of an amount with a calculator:

Amount $\times$ percentage as a decimal

Key Concept

Percentage increase/decrease:

Amount $\times (1 \pm \text{percentage as a decimal})$



SUBJECT: Maths

UNIT:

Year 9 Algebra

SANDHILL VIEW
EST. 1953



ACHIEVE · ASPIRE · ENJOY

Key Concept

Substitution
It is vital we understand that substitution is not just replacing a number but doing as the expression implies.

$$3a = 3 \times a$$

$$\text{If } a = 2 \text{ then } 3a = 3 \times 2 = 6$$

$$a^2 \text{ if } a=3 \text{ would be } 3^2 = 3 \times 3 = 9$$

$$a+5 = 3+5 = 8$$

$$3abc \text{ would mean } 3 \times a \times b \times c$$

Key Concept

Types of Sequence

Sequence as pictures:



Linear sequence:

4, 7, 10, 13, 16, ...

+3 +3 +3 +3

Fibonacci sequence:

(add the previous two terms)

1, 1, 2, 3, 5, 8, ...

Key Words

Linear: A sequence that has a term to term rule with a common difference. When graphed, is a straight line

Equation: A mathematical statement that shows that two expressions are equal.

Indices: These are the squares, cubes and powers.

Key Concepts

Inequalities show the **range** of numbers that satisfy a rule.

$x < 2$ means x is less than 2

$x \leq 2$ means x is less than or equal to 2

$x > 2$ means x is greater than 2

$x \geq 2$ means x is greater than or equal to 2

On a **number line** we use circles to highlight the key values:

○ is used for less/greater than

● is used for less/greater than or equal to

Key Concept

Expanding Double Brackets

To multiply out brackets, we use the grid method.

Examples

$$(x-2)(x+9)$$

x	x	-2
x	x^2	$-2x$
+9	$+9x$	-18

$$= x^2 - 2x + 9x - 18 = x^2 + 7x - 18$$