Y7 Mastery: Unit 6 – Expressions, Equations and Inequalities (Part 1)

Algebraic Notation

Each square represents the value of a
When we have 2 squares, we have **2 lots of a**
We write this as $2a$ and it is called a **term**.

If we add another amount of a, we write this as $2a + 5a$
This is called an **expression**.

When we work out the answer to this addition, the expression becomes an **equation**. $2a + 5a = 7a$

When terms are multiplied, they become squared.
We show this with a power/index of 2:

$$a \times a = a^2$$

Simplifying Expressions

Simplify:

$4r - 5s + 2rs - 8s - 3r$ Highlight the **like terms**.

$4r - 5s + 2rs - 8s - 3r$ Include the operation in front!

$4r - 3r - 5s - 8s + 2rs$ Collect the like terms together and add or subtract them to **simplify**.

$1r - 13s + 2rs$

Final answer is **r – 13s + 2rs**
(we don't write the 1)

Other Topics/Units this could appear in:

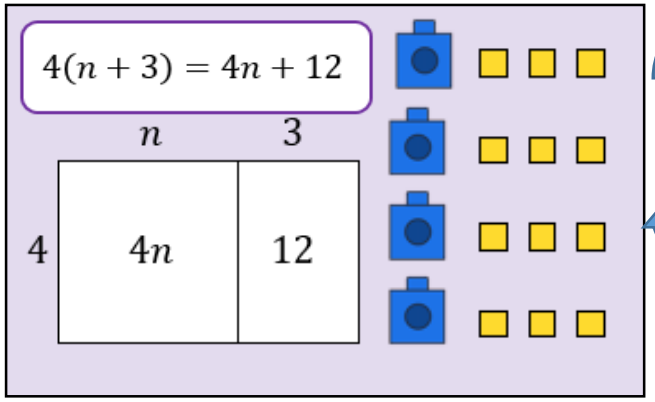
- Expressions & substituting into simple formulae
- Expand and simplify
- Factorising
- Solving Equations
- Subject of Inequalities

Keyword/Skill	Definition/Tips
Variable	A symbol for a number we do not know yet, it is usually a letter.
Term	Either a single number or a **variable,** such as 4 or n or 3a or 6y.
Expression	A mathematical statement written using **symbols**, **numbers** or **letters**.
Equation	A statement showing that **two expressions are equal.**
Formula	Shows the **relationship** between **two or more variables.**
Simplifying Expressions	**Collect 'like terms'.** Be careful with negatives. x^2 and x are not like terms.
Substitute	In algebra it means replacing letters with numbers.
Expand	When we **multiply** a **term** across a bracket, e.g. 3(a + 2) = 3a + 6
Factorise	The **inverse** of **expand**. When we divide an **expression** by all **common factors** or **terms**, e.g. 6g + 4 = 2(3g + 2) and $a^2 - 2a = a(a - 2)$

Expanding brackets

We can use the **distributive property** to expand brackets.

$4(n + 3) = 4n + 12$

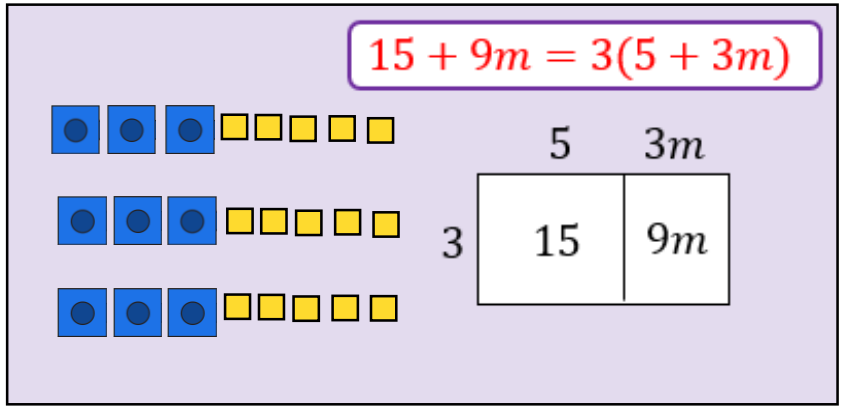


Factorising is the **inverse** of expanding

Factorising

We can **factorise** a number or expression by writing it as a product of two or more **factors**.

$15 + 9m = 3(5 + 3m)$



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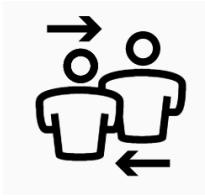
We can **evaluate** an **expression** or **formula** by **substituting** (replacing) a letter or letters in the expression or formula with a number.



Substitution

Examples:

Work out the value of these expressions when **n = 3**.

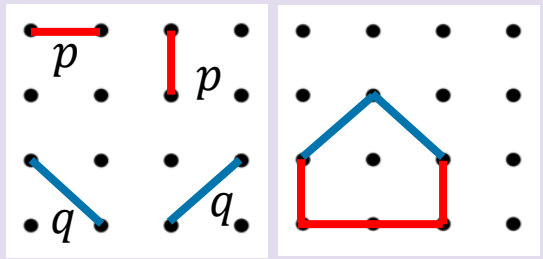
a) 2n b) n – 3 c) 2n – 10 d) $n^2 + 2n$

b) 2n means 2 x n so 2 x 3 = 6

b) 3 – 3 = 0

c) 2 x 3 – 10 = 6 – 10 = – 4

d) n^2 means n x n so
3 x 3 + 2 x 3 = 9 + 6 = 15

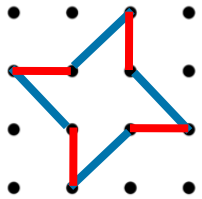


$$4p + 2q = 2(2p + q)$$

We can write an **expression** for the **perimeter** of a shape in **factorised** and **unfactorised** form.

Factorised and Unfactorising with Shape (Challenge)

"Two groups of length $2p + q$"



$$4p + 4q = 4(p + q)$$

You can see four groups of length $p + q$…

e.g. Four of

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