Year 7 - Unit 10: Brackets

Learning Journey:

Prior Learning

- Simplify algebraic expressions by collecting like terms.
- Use multiplication facts and understand the distributive law.

Next Steps

- Expand double brackets and solve equations involving brackets.
- Apply expanding and factorising skills to quadratics and GCSE algebra problems.

By the end of this unit, you should be able to:

- Expand single brackets and simplify the resulting algebraic expressions.
- Factorise algebraic expressions into a single bracket by finding the highest common factor.

Keywords:

Distributive law – Multiply the term outside the bracket by every term inside.
Expand – Remove brackets by multiplying.
Factorise – Write an expression as a product of factors.
Expression – A mathematical statement containing numbers, letters and operations.
Like terms – Terms with the same variables and powers.
Highest common factor (HCF) – The greatest factor shared by two or more terms.

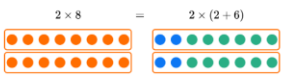
Using the distributive law

The **distributive property** states that multiplying the sum of two or more numbers is the same as multiplying the additions separately.

For example,

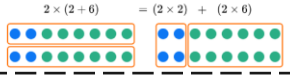
When multiplying 2×8, you can break 8 up into $2 + 6$.

$2 \times 8 = 2 \times (2 + 6)$



The distributive property says that you can multiply the parts separately and then add the products together.

$2 \times (2 + 6) = (2 \times 2) + (2 \times 6)$



Expanding Single brackets

When you expand a bracket, you are removing a set of brackets from an expression. To do this, you multiply the term outside the bracket by each separate term inside the bracket.

E.g. $3(2x + 5)$

$3 \times 2x = 6x$
$3 \times 5 = 15$

We combine these into a single expression for our answer:
$6x + 15$

Expanding single brackets and simplifying expressions

Expand and simplify combines two algebraic processes:

- **Expanding brackets**, where we remove brackets by multiplying them out;
- **Simplifying** the expression by **collecting like terms**.

Example Expand and simplify $2(x + 5) + 3(x - 2)$

1 Expand the brackets $2(x + 5) + 3(x - 2) = 2x + 10 + 3x - 6$

2 Collect like terms $2x + 10 + 3x - 6 = 5x + 4$

The simplified expression is $5x + 4$

Factorising into a single bracket

Factorising to a single bracket means that we take out the **highest common factor** from each term in an algebraic expression, and then write the expression as a **product** of the HCF and a single bracket.

Example

$3x + 6 = 3(x + 2)$

3 is the HCF of $3x$ and 6, so this is written outside the single bracket.

Example

$4xy + 6y = 2y(2x + 3)$

$2y$ is the HCF of $4xy$ and $6y$, so this is written outside the single bracket.