# Year 9 Maths Learning Journey

Autumn Term 3

Reasoning with algebra: Testing conjectures

| Core knowledge | Reference |
|---|---|
| **Factors, multiples and primes (R)**<br>"What's the difference between a factor and a multiple? Can one number be both a factor and a multiple?" | Worksheet |
| **True or false**<br>"How can you show the statement is true or false? How many cases do you need to look at?" | Worksheet |
| **Always, sometimes, never true**<br>"Is the result true for 0 and 1? What about fractions? What about negative numbers?" | Worksheet |
| **Show that**<br>"What can you work out from the given information? What could you find out next?" | Worksheet |
| **Conjectures about number**<br>"If a number is even and we multiply it by an integer, what can we say about the result?" | Worksheet |
| **Expand a pair of binomials**<br>"Why is the expansion of a pair of binomials called a quadratic expression? What other words use the prefix 'quad-'?" | Worksheet |
| **Conjectures with algebra**<br>"How many values do we need to show a conjecture is false?" | Worksheet |
| **Explore the 100 grid**<br>"What is the expression for the number to the right of $n$ on a grid" | Worksheet |
| **Explore three binomials (H)**<br>"What's the difference between a cubic expression and a quadratic expression" | Worksheet |

## Learning Checkpoints

| LC Title | Completed | Dirt |
|---|---|---|
| Testing conjectures | | |

**Key Vocabulary:**

**Binominal:** A binomial is a polynomial with two terms.

**Common:** Values that are the same.

**Conjecture:** A conclusion or a proposition that is proffered on a tentative basis without proof.

**Counter-example:** Where a hypothesis or general statement is offered, an example that clearly disproves it

**Demonstrate:** to describe, explain, or illustrate by examples.

**Even:** An integer that is divisible by 2.

**Expand:** Multiply to remove the brackets.

**Express:** We write an expression in math by using numbers or variables and mathematical operators which are addition, subtraction, multiplication, and division.

**Expression:** A mathematical form expressed symbolically.

**Factor:** When a number, or polynomial in algebra, can be expressed as the product of two numbers or polynomials, these are factors of the first.

**Factorise:** To express a number or a polynomial as the product of its factors.

**In terms of n:** The ' n ' stands for the term number

**Multiple:** For any integers a and b, a is a multiple of b if a third integer c exists so that a = bc

**Odd:** An integer that has a remainder of 1 when divided by 2.

**Prime:** A whole number greater than 1 that has exactly two factors, itself and 1.

**Prove:** To formulate a chain of reasoning that establishes in conclusion the truth of a proposition.

**Quadratic:** Describing a expression of the form $ax2 + bx + c$ where a, b and c are real numbers

**Simplify:** reducing the expression in a simpler form.

**Term:** a single mathematical expression. It may be a single number (positive or negative), a single variable ( a letter ), several variables multiplied but never added or subtracted.

**Verify:** make sure or demonstrate that (something) is true, accurate, or justified.