

## KS3 Algebra Progression Grid

By the end of KS3, pupils will be able to:

- Understand basic algebraic forms.
- Build and form one step equations using function machines.
- Describe and continue sequences using diagrams and lists of numbers.
- Recognise and use linear graphs.
- Recognise and use non-linear graphs.
- Plot linear graphs.
- Multiply out a single bracket and factorise into a single bracket.
- Expand a pair of binomials.
- Find the nth term for linear sequences and generate sequences from an nth term rule.
- Simplify expressions with powers.
- Substitute into formulae and equations.
- Add, subtract, multiply and divide simple algebraic fractions.
- Form and solve linear equations and inequalities.
- Rearrange formulae and equations.
- Test algebraic conjectures.

|                                                  | Algebra - Understand Notation and Substitute: Acquire and Apply                                                                                                                                                                                                            | Algebra - Equivalence and Proof: Acquire and Apply                                                                                                                                                                                                    | Algebra - Solve Equations and Inequalities: Acquire and Apply                                                                                                                                                                                              | Algebra - Linear and Non-linear Graphs: Acquire and Apply                                                                                                                                                                                                                                                                                                                                                                                                             | Algebra - Sequences: Acquire and Apply                                                                                                                                                                               |
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| Year 9<br>Greater<br>Depth                       | Can substitute into more complex formulae and equations.                                                                                                                                                                                                                   | Can change the subject of a more complex formula.<br>Can expand three binomials.                                                                                                                                                                      | Can use equations to solve complex word problems.<br>Can rearrange complex formulae including brackets and squares.                                                                                                                                        | Can use graphs and tables to solve complex word problems.<br>Can investigate graphs of simultaneous equations.<br>Can solve simultaneous equations graphically.<br>Can recognise perpendicular lines.<br>Can model real-life graphs including inverse proportion.<br>Can write an equation in the form $y=mx + c$ .                                                                                                                                                   | Can find the rule for the nth term of a sequence – extended for complex sequences.                                                                                                                                   |
| Year 9<br>Expected<br>Year 8<br>Greater<br>Depth | Can explore and understand powers of powers.<br>Can substitute into formulae and equations.<br>Can multiply and divide simple algebraic fractions.                                                                                                                         | Can expand a pair of binomials.<br>Can rearrange an equation to the form $y=mx +c$ .<br>Can rearrange formulae (one-step).<br>Can rearrange formulae (two-step).<br>Can test algebraic conjectures.<br>Can investigate algebraic proof                | Can form and solve equations and inequalities with unknowns on both sides.<br>Can represent inequalities.<br>Can solve equations and inequalities in context.                                                                                              | Can explore and understand direct proportion graphs.<br>Can explore and understand gradients.<br>Can explore and understand non-linear graphs.<br>Can find the midpoint of a line segment.<br>Can draw and interpret quadratic graphs.<br>Can interpret graphs in many forms, including reciprocal and piecewise, exponential and speed/distance/time.<br>Can simplify, use and interpret $y=mx + c$ .<br>Can understand the properties of parallel lines on an axes. | Can find the rule for the nth term of a sequence.<br>Can test conjectures with algebra.<br>Can represent sequences (review and extend to problem solving contexts).                                                  |
| Year 8<br>Expected<br>Year 7<br>Greater<br>Depth | Can form algebraic expressions.<br>Can add and subtract expressions with indices.<br>Can add and subtract simple algebraic fractions.<br>Can simplify algebraic expressions by multiplying and dividing indices.<br>Can use the addition and subtraction laws for indices. | Can add and subtract simple algebraic fractions.<br>Can multiply out a single bracket.<br>Can factorise into a single bracket.<br>Can expand multiple brackets and simplify.<br>Can identify and use formulae, expressions, identities and equations. | Can solve equations including brackets.<br>Can form and solve equations with brackets.<br>Can understand and solve simple inequalities.<br>Can form and solve simple inequalities.<br>Can identify and use formulae, expressions, identities and equations | Can explore and understand conversion graphs.<br>Can work with coordinates in all four quadrants.<br>Can identify and draw lines that are parallel to the axes.<br>Can recognise and use lines of the form:<br><ul style="list-style-type: none"> <li>- <math>y = x</math></li> <li>- <math>y = kx</math></li> <li>- <math>y = x + a</math></li> <li>- <math>y = mx + c</math></li> </ul> Can recognise graphs with negative gradients.                               | Can find missing numbers within sequences.<br>Can generate sequences given complex algebraic rules.                                                                                                                  |
| Year 7<br>Expected                               | Can use function machines to find inputs, outputs and number operations, for one and two step expressions.<br>Can use diagrams and letters to generalise number operations.<br>Can substitute values into single and two-step expressions.                                 | Can understand the difference between equality and equivalence.<br>Can understand the meaning of like and unlike terms.<br>Can simplify algebraic expressions by collecting like terms.<br>Can collect like terms in the context of directed numbers. | Can form and solve one-step equations.<br>Can form and solve two-step equations.                                                                                                                                                                           | Can represent functions graphically.                                                                                                                                                                                                                                                                                                                                                                                                                                  | Can recognise linear and non-linear sequences.<br>Can continue linear and non-linear sequences.<br>Can generate sequences from an algebraic rule. Can explain the term to term rule of numerical sequences in words. |

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|  | Can evaluate algebraic expressions with directed numbers.<br>Can use known algebraic facts to derive other facts. | Can use known algebraic facts to derive other facts. |  |  | Can represent sequences in tabular and graphical forms. |
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