The Sutton Academy

Knowledge Rich Curriculum Plan

Year 8 Prime – Sequences and Graphs

Lesson Objective	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this, students need to already know that…*	Assessment
To learn how to generate a sequence from the nth term and find the nth term for a sequence	• Students will know how to generate a linear sequence using the nth term • Students will know how to generate a quadratic sequence from its nth term • Students will understand the relationship between the nth term of a sequence and the terms in a sequence, for example a '2n' sequence goes up in 2s etc • Students will know how to find the nth term of a linear sequence • Students will know how to find the nth term of a pattern sequence.	**Sequence** - a particular order in which related things follow each other. **Linear or Arithmetic Sequence** – a number pattern which increases (or decreases) by the same amount each time **Geometric Sequence –** a sequence made by multiplying by the same value each time **Generate –** produce or create. **Substitute –** use or add in place of **Nth Term –** a formula that enables us to find any term in a sequence. The ' n ' stands for the term number	• Students should already know how to find missing terms in pattern, linear and geometric sequences • Students should already know how to identify the term-to-term rule for linear and geometric sequences	Mini-Assessment 6
To learn how to find and use the nth term of a linear sequence	• Students will know how to find the nth term of a linear sequence • Students will know how to identify whether a term can be in a sequence given its nth term by forming and solving a linear equation • Students will know how to find and use the nth term to determine whether a number will be in a linear sequence		• Students will need to know how to solve linear equations	Mini-Assessment 6
To learn how to draw straight line graphs	• Students will know how to plot and draw graphs that are parallel to either the x- or y-axis (equations in the form y = a, x = a) • Students will know how to plot the graphs of y = x and y = -x • Students will know how to plot graphs in the form y = x + c or y = x - c • Students will know how to plot graphs in the form y = mx + c or y = mx – c • Students will know how to plot straight line graphs in the form y = mx + c by first completing a given table of values **Opportunity for challenge:** • Students will know how to plot and draw graphs of straight lines in the form x + y = c	**Coordinate –** two numbers or sometimes a letter and a number, that locate a specific point on a grid. They are written in the form (x, y) most commonly. **Vertical –** something that is vertical stands or points straight up **Horizontal –** something that is arranged sideways, parallel to the horizon, like a person lying down **Quadrant –** one of the four quarters of the coordinate plane **Substitute –** use or add in place of	• Students should already know how to plot coordinates in all four quadrants • Students should already know how to write the coordinates for a point plotted in any of the four quadrants	Mini-Assessment 6
To learn how to interpret the equation of a straight line and calculate gradient	• Students will know how to identify the gradient and y-intercept of a straight line given the equation in the form y = mx + c • Students will know how to calculate gradient between two pairs of coordinates. • Students will know that $gradient = \frac{change\ in\ y}{change\ in\ x}$	**Gradient** – steepness. The gradient of a line tells us how steep the line is.	• Students will need to know how find the difference between two numbers	Mini-Assessment 6
To learn how to find the equation of a straight line	• Students will know how to identify the gradient and y-intercept of a straight line given the equation. • Students will know that $gradient = \frac{change\ in\ y}{change\ in\ x}$ • Students will know that the equation of a straight line can be written in the form y = mx + c where m tells us the gradient of the line and c tells us the y-intercept • Students will know how to find the equation of a given straight line	**Intercept** – cross **Y-intercept** – the y-intercept tells us where a graph crosses the y-axis, this where x = 0 **X-intercept** – the x-intercept tells us where a graph crosses the x-axis, this where y = 0 **Gradient** – steepness. The gradient of a line tells us how steep the line is.	• Students need to know how to write coordinates	Mini-Assessment 6

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To learn how to find the equation of a straight line from 2 pairs of coordinates	• Students will know how to find the equation of a line between two pairs of coordinates		• Students will need to know how to calculate gradient • Students will need to know how to substitute numbers into formulae	Mini-Assessment 6
To learn how to solve linear simultaneous equations	• Students will know how to solve linear simultaneous equations or find estimates to their solutions given two straight lines drawn on a graph • Students will know how to use elimination to solve linear simultaneous equations algebraically	**Intersection –** a point at which two or more things cross **Simultaneous –** occurring, operating, or done at the same time. **Simultaneous equations –** equations involving two or more unknowns that are to have the same values in each equation. **Linear Equation –** an equation between two variables that can be written in the form y = mx + c. Linear equations give a straight line when plotted on a graph.	• Students will need to know how to calculate with negatives	Mini-Assessment 6
To learn how to solve linear simultaneous equations	• Students will know how to use elimination to solve linear simultaneous equations algebraically **Opportunity for Challenge:** • Students will know how to solve linear simultaneous equations representing a real-life situation and interpret the solution in the context of the problem		• Students will need to know how to solve linear equations	Mini-Assessment 6
To learn how to draw quadratic graphs	• Students will know how to generate points for a simple quadratic graph <u>without</u> a calculator • Students will know how to use a calculator to generate points for a quadratic graph in the form $y = ax^2 + bx + c$ where a = 1 and b and c are any integer including 0 • Students will know how to plot a quadratic graph once they have generated the points • Students will know that the points for a quadratic graph should be joined with a smooth curve **Opportunity for Challenge:** • Students will know how to use a calculator to generate points for a quadratic graph in the form $y = ax^2 + bx + c$ where $a \neq 1$ and b and c are any integer including 0	**Quadratic –** An expression or equation where the highest power is 2. **Parabola –** the U or ∩ shape of a quadratic graph	• Students will need to know how to calculate with negative numbers without a calculator • Students will need to know how to square negative numbers without a calculator • Students will need to know how to substitute both positive and negative integers into formulae without a calculator	Mini-Assessment 6