Knowledge Rich Curriculum Plan

Year 8 Core – 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 continue sequences of diagrams and numbers and identify and use the term-to-term rule	• Students will know how to find the next terms in pattern sequences • Students will know how to continue linear sequences to find subsequent terms • Students will know how to continue geometric sequences to find subsequent terms • Students will know how to continue other simple sequences • Students will know how to identify the term to term rule for an arithmetic sequence • Students will know how to identify the term to term rule for a geometric sequence • Students will understand the difference between arithmetic and geometric sequences • Students will know how to use ascending/descending to describe sequences. • Students will know that triangular numbers are numbers that make a triangular dot pattern. E.g. 1,3,6,10,15 • Students will know how to recognise and continue Fibonacci sequences • Students will know how to continue a quadratic sequence • Students will know how to find missing terms in a sequence given the term-to-term rule • Students will know how to find missing terms within a sequence by first finding the term-to-term rule	**Sequence** - a particular order in which related things follow each other. **Ascending** – going up **Descending** – going down **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 **Fibonacci Sequence** – a sequence of numbers in which each number is the sum of the two preceding numbers. The simplest is the series 1, 1, 2, 3, 5, 8, etc. **Triangular Numbers** – any of the series of numbers (1, 3, 6, 10, 15, etc.) obtained by continued adding of the natural numbers 1, 2, 3, 4, 5, etc. **Quadratic** – involving a squared algebraic term but no other power higher than 2	• Students should already know how to continue a numerical, linear sequence and a pattern sequence • Students should already know how to identify the term-to-term rule for a sequence	Mini-Assessment 6
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 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 **Opportunity for Challenge:** • Students will know how to generate a quadratic sequence from its nth term • Students will know how to find the nth term of a pattern sequence.	**Generate** – produce or create. **Substitute** – use or add in place of	• Students will need to know how to substitute numbers into linear formulae	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 find the nth term of a pattern 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	**Nth Term** – a formula that enables us to find any term in a sequence. The ' n ' stands for the term number	• Students will need to know how to solve linear equations	Mini-Assessment 6

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 write and plot coordinates in all four quadrants	• Students will need to know that the horizontal axis is the x-axis and that the vertical axis is the y-axis. • Students will know how to plot coordinates in all four quadrants. • Students will know how to write the coordinates of a point plotted in any of the four quadrants • Students will know how to solve shape problems involving plotting coordinates • 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 **Opportunity for challenge:** • Students will know how to plot graphs in the form y = x + c or y = x - 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	• Students will need to know how to read from a number line	Mini-Assessment 6
To learn how to draw straight line graphs	• 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 • Students will know how to plot straight line graphs in the form y = mx + c by first completing a given table of values • Students will know how to plot straight line graphs in the form y = mx + c by constructing their own table of values **Opportunity for challenge:** • Students will know how to plot and draw graphs of straight lines in the form x + y = c	**Substitute –** use or add in place of	• Students should already know how to substitute positive and negative integers into formulae • Students will know how to plot coordinates	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. **Intercept –** cross **Y-intercept –** the y-intercept tells us where a graph crosses the y-axis, this where x = 0	• Students will need to know how draw a straight line graph.	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	**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 find the gradient from a set of points.	Mini-Assessment 6
To learn how to draw quadratic graphs	• Students will know how to generate points for a quadratic graph in the form y = ax² + bx + c where a = 1 and b and c are any integer including 0, with and without a calculator. • 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	**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 substitute both positive and negative integers into formulae. • Students will need to know how to draw a straight line graph.	Mini-Assessment 6