The Sutton Academy

Knowledge Rich Curriculum Plan

Year 8 Support – Sequences and Graphs

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success	Feedback
To learn how to continue sequences of diagrams and numbers and identify 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 know how to use ascending/descending to describe sequences. • Students will know how to recognise and continue Fibonacci sequences. **Opportunity for challenge:** • Students will know that triangular numbers are numbers that make a triangular dot pattern. E.g. 1,3,6,10,15	**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. **Cultural capital**	• Students need to know how to identify a sequence or pattern.	Steps to Success – Pattern Sequences Step 1 – Identify how many items/pictures is contained in each pattern, you may want to write this above each one. Step 2 – Work out what has been done to the previous term to get the next term in the sequence e.g. +5 Step 3 – Continue to carry out the same calculation to each of the patterns until you reach the required pattern number. If asked to continue the pattern draw it. **Steps to Success – Linear Sequences** Step 1 – Identify the difference between each term, you may want to write it above the term, it is important to check that it is happening to each term. Step 2 – Either add or subtract to the previous term to find the next term/terms. **Steps to Success – Geometric Sequences** Step 1 – Identify the difference between each term for geometric sequences, they have either been multiplied or divided by a number Step 2 – Multiply or divide the term by the number to find the next terms in the sequence.	
To learn how to find missing terms in sequences given the term-to-term rule.	• 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. • Students will be able to find the value of a term in the sequence by continuing the sequence until they have reached the needed term.		• Students need to know how to add, subtract, multiply and divide integers.	**Steps to Success – Linear Sequences** Step 1 – Identify the difference between each term, you may want to write it above the term, it is important to check that it is happening to each term. Step 2 – Either add or subtract to the previous term to find the next term/terms.	
To learn how to generate a sequence from the nth term.	• 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. **Opportunity for Challenge:** • Students will know how to find the value of any term in a sequence by substitution. E.g. Find the 100^{th} term.	**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 need to know how to substitute numbers into algebraic expressions.	**Steps to Success – Using the nth term** **Step 1**: Identify the nth term, if this is not given to you then you will need to calculate it. **Step 2**: If the question is asking you to find a particular term in the sequence, for instance the 100^{th} term, you would substitute that number into the expression. **Step 3**: If the question is asking you to generate a sequence using the nth term you would substitute the numbers of the sequence in, e.g. for term 1, 1 for term 2, 2 etc	

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To learn how to find 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. **Opportunity for Challenge:** • Students will know how to identify and reason whether a term can be in a sequence. E.g. The sequence is made from all even numbers and the term is odd.		• Students need to know how to describe the term-to-term rule for a sequence.	**Finding the nth term of linear sequences – Steps to success** **Step 1:** Find the differences between each term – these should be the same number. **Step 2:** Place your number in front of the letter n to get an. **Step 3:** Substitute the number 1 into your nth term. **Step 4:** Work out what you would do to get to the first term in the sequence. **Step 5:** Make this adjustment to your nth term.	
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 **Opportunity for challenge:** • Students will know how to solve shape problems involving plotting coordinates	**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 need to know how to identify and read numbers from a number line.		
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 **Opportunity for challenge:** • Students will know how to plot straight line graphs in the form y = mx + c by constructing their own table of values.	**Substitute –** use or add in place of	• Students need know how to plot and draw graphs of y = a, x = a, y = x and y = –x. IF STUDENTS DO NOT KNOW THIS A PRIOR KNOWLEDGE CONSOLIDATION TASK MUST BE COMPLETED.	**Steps to Success – Plotting Straight Line Graphs** **Step 1**: Use the table of values for your coordinates for drawing the graph. If a table is not provided, create one using the x values on the axis as the x values in your table. Substitute your x values into the equation of the line in order to find your y coordinates. Remember to use brackets and follow BIDMAS. **Step 2**: Choose a pair of coordinates (x,y) from your table to plot on the graph. Remember that the 'x' coordinate is for the horizontal axis and the 'y' coordinate is for the vertical axis. Mark this point on the graph. **Step 3**: Continue this process until all pairs of coordinates have been plotted. **Step 4**: Join up the points with one straight line using a pencil and a ruler. If the coordinates do not form a straight line, check each coordinate is plotted correctly.	
Mini-Assessment 6					