



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 Prime – Sequences and Graphs

| Lesson Objective | Intended Knowledge: <i>Students will know that...</i> | Tiered Vocabulary | Prior Knowledge: <i>In order to know this, students need to already know that...</i> | Assessment |
|---|--|---|---|--------------------------|
| <p>To learn how to continue sequences of diagrams and numbers and identify and use the term-to-term rule</p> | <ul style="list-style-type: none"> • 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 | <p>Sequence - a particular order in which related things follow each other.</p> <p>Ascending – going up</p> <p>Descending – going down</p> <p>Linear or Arithmetic Sequence – a number pattern which increases (or decreases) by the same amount each time</p> <p>Geometric Sequence – a sequence made by multiplying by the same value each time</p> <p>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.</p> <p>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.</p> <p>Quadratic – involving a squared algebraic term but no other power higher than 2</p> | <ul style="list-style-type: none"> • 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 | <p>Mini-Assessment 6</p> |
| <p>To learn how to generate a sequence from the nth term and find the nth term for a sequence</p> | <ul style="list-style-type: none"> • 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 <p>Opportunity for Challenge:</p> <ul style="list-style-type: none"> • 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. | <p>Generate – produce or create.</p> <p>Substitute – use or add in place of</p> | <ul style="list-style-type: none"> • Students will need to know how to substitute numbers into linear formulae | <p>Mini-Assessment 6</p> |
| <p>To learn how to find and use the nth term of a linear sequence</p> | <ul style="list-style-type: none"> • 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 | <p>Nth Term – a formula that enables us to find any term in a sequence. The 'n' stands for the term number</p> | <ul style="list-style-type: none"> • Students will need to know how to solve linear equations | <p>Mini-Assessment 6</p> |

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|--|---|---|--|--------------------------|
| <p>To learn how to write and plot coordinates in all four quadrants</p> | <ul style="list-style-type: none"> • 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 $y = -x$ <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> • Students will know how to plot graphs in the form $y = x + c$ or $y = x - c$ | <p>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.</p> <p>Vertical – something that is vertical stands or points straight up</p> <p>Horizontal – something that is arranged sideways, parallel to the horizon, like a person lying down</p> <p>Quadrant – one of the four quarters of the coordinate plane</p> | <ul style="list-style-type: none"> • Students will need to know how to read from a number line | <p>Mini-Assessment 6</p> |
| <p>To learn how to draw straight line graphs</p> | <ul style="list-style-type: none"> • 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 <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> • Students will know how to plot and draw graphs of straight lines in the form $x + y = c$ | <p>Substitute – use or add in place of</p> | <ul style="list-style-type: none"> • Students should already know how to substitute positive and negative integers into formulae | <p>Mini-Assessment 6</p> |
| <p>To learn how to interpret the equation of a straight line and calculate gradient</p> | <ul style="list-style-type: none"> • 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 = $\frac{\text{change in } y}{\text{change in } x}$ | <p>Gradient – steepness. The gradient of a line tells us how steep the line is.</p> | <ul style="list-style-type: none"> • Students will need to know how find the difference between two numbers | <p>Mini-Assessment 6</p> |
| <p>To learn how to find the equation of a straight line</p> | <ul style="list-style-type: none"> • Students will know how to identify the gradient and y-intercept of a straight line given the equation. • Students will know that gradient = $\frac{\text{change in } y}{\text{change in } x}$ • 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 | <p>Intercept – cross</p> <p>Y-intercept – the y-intercept tells us where a graph crosses the y-axis, this where $x = 0$</p> <p>X-intercept – the x-intercept tells us where a graph crosses the x-axis, this where $y = 0$</p> <p>Gradient – steepness. The gradient of a line tells us how steep the line is.</p> | <ul style="list-style-type: none"> • Students need to know how to write coordinates | <p>Mini-Assessment 6</p> |
| <p>To learn how to draw quadratic graphs</p> | <ul style="list-style-type: none"> • 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 | <p>Quadratic – An expression or equation where the highest power is 2.</p> <p>Parabola – the U or \cap shape of a quadratic graph</p> | <ul style="list-style-type: none"> • Students will need to know how to substitute both positive and negative integers into formulae | <p>Mini-Assessment 6</p> |