The Sutton Academy

Knowledge Rich Curriculum Plan

Year 12 Maths

Unit 5 - Straight line graphs

Maths Year 12	Unit: Straight line graphs			
Lesson/Learning Sequence	**Intended Knowledge:** *Students will know that…*	**Tiered Vocabulary**	**Prior Knowledge:** *In order to know this students, need to already know that…*	**Assessment**
Lesson 22: y = mx + c Lesson Objective: To learn how to find and identify the gradient and y-intercept.	• Students will know how to find the gradient of a straight line joining two points by finding the vertical and horizontal differences between the points and then dividing. • Students will know how to use a gradient and a point to find the x or/and y coordinate of a second point. • Students will know that points are collinear if they lie on the same straight line. • Students will know how to prove points are collinear by finding gradients. • Students will know how to rearrange equations of straight lines to find the gradient and y-intercept. • Students will know how to write equations of straight lines in the form ax + by + c =0. • Students will know to substitute y=0 into the equation of a straight line to find where the line intercepts the x-axis. • Students will know to substitute x=0 into the equation of a straight line to find where the line intercepts the y-axis.		• *Students need to know how to rearrange formulae.* • *Students need to know how to substitute into equations.* • *Students need to know that the gradient measures the steepness of a straight line.* • *Students need to know that the gradient of a straight line is represented by m in y=mx + c.* • *Students need to know that the y-intercept of a straight line is where the line crosses the y-axis.* • *Students need to know that the y-intercept of a straight line is represented by c in y=mx + c.* • *Students need to know how to find the gradient a straight line on a graph.*	
Lesson 23: Equations of straight line Lesson Objective: To learn how to find the equation of a straight line.	• Students will know how to define the equation of a straight line using one point and the gradient. • Students will know how to define the equation of a straight line by using two different points. • Students will know how to use the equation of a line to find unknown values in coordinates. • Students will know how to use the equation of one straight line to find the equation of another straight line with a known point and gradient. • Students will know how to use the equation of one straight line to find the equation of another straight line with two known points. • Students will know how to use the equations of one straight line to find the equation of another straight line with one known point where the lines cross.		• *Students need to know how to substitute values in an equation.* • *Students need to know how to rearrange formulae.* • *Students need to know how to identify the gradient and y-intercept of a straight line.* • *Students need to recognise y = mx + c and ax + by + c = 0 as equations of straight line.*	

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Lesson/Learning Sequence	**Intended Knowledge:** *Students will know that…*	**Tiered Vocabulary**	**Prior Knowledge:** *In order to know this students, need to already know that…*	**Assessment**
Lesson 24: Parallel and perpendicular lines Lesson Objective: To learn how to find the equations of parallel and perpendicular lines.	• Students will know that parallel lines will have the same gradient. • Students will know how to identify whether two lines are parallel by comparing the gradients of each line. • Students will know how to find a parallel line knowing the gradient and one point. • Students will know how to use the gradient of one line to find the gradient of a perpendicular line. • Students will know to find the negative reciprocal of the gradient of a line to find the perpendicular gradient. • Students will know that the product of the gradients of two perpendicular lines is -1. • Students will know how to find the perpendicular equation of a line by knowing the perpendicular gradients and a point.		• *Students need to know how to rearrange formulae.* • *Students need to know how to substitute into equations.* • *Students need to know how to use the gradients and a point to find the equation of a straight line.* • *Students need to know how to use two points to find the gradient.* • *Students need to know how to use two points to find the equation a straight line.* • *Students need to know that parallel are always the same distance apart and never cross.* • *Students need to know that perpendicular lines are at 90 degrees to each other.*	
Lesson 25: Length and area Lesson Objective: To learn how to find the distance between two points and area of triangles bounded by straight lines.	• Students will know how to find the distance between two points using Pythagoras' theorem. • Students will know that congruent lines are equal in length. • Students will know how to find the area bounded by two straight lines and an axes. • Students will know how to find the area bounded by three straight lines. • Students will know that the area bounded by three straight lines is a triangle.		• *Students need to know how to use Pythagoras' theorem to find the hypotenuse.* • *Students need to know how to use Pythagoras' theorem to find one of the shorter sides.* • *Students need to know how use linear simultaneous equations to find the point of intersection of two lines.* • *Students need to know how to find the area of a triangle.* • *Students need to know how to find the equation of a perpendicular line.* • *Students need to know how to sketch straight lines.*	
Lesson 26: Modelling with straight lines Lesson Objective: To learn how to model situations using straight line graphs. Intended knowledge	• Students will know that two quantities are in direct proportion when they increase at the same rate. • Students will know that a linear model is used to show the relationship between two variables, x and y. • Students will know that it is still appropriate to use a linear model when the points don't lie on the line. • Students will know that the closer the points are to the straight line then the more accurate a linear model is.		• *Students need to know how to draw a straight-line graph.* • *Students need to know how to find the equation of a straight line.* • *Students needs to know how to find the gradient of a straight line.* • *Students need to know how to find the equation of a parallel line.* • *Students need to know how to find the equation of a perpendicular line.*	

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Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
	• Students will know that a mathematical model is an attempt to represent a real-life situation using mathematical concepts. • Students will know how to make realistic assumptions to create a model. • Students will know how to interpret the meanings of the gradient and y-intercept in a real-life context. • Students will know how to represent a linear model on a graph. • Students will know how to use the model to make estimates in real-life contexts.		• *Students need to know how to use straight lines graphs to make estimates.* • *Students need to know how to use direct proportion.*	