

Greenfields Academy (Secondary) - Long Term Planning – MATHS

Academic Year Overview 2020/21 – YEAR 9

Term	Autumn		Spring		Summer	
	1	2	3	4	5	6
TRANSITION FROM Year 9	<u>Reasoning with Algebra</u> <ul style="list-style-type: none"> • Straight Line Graphs • Forming and Solving Equations • Testing Conjectures 	<u>Constructing in 2 and 3 Dimensions</u> <ul style="list-style-type: none"> • Three Dimensional Shapes • Constructions and Congruency 	<u>Reasoning with Number</u> <ul style="list-style-type: none"> • Numbers • Using Percentages • Maths and Money 	<u>Reasoning with Geometry</u> <ul style="list-style-type: none"> • Deduction • Rotation and Translation • Pythagoras' Theorem 	<u>Reasoning with Proportion</u> <ul style="list-style-type: none"> • Enlargement and similarity • Solving ration and proportion problems • Rates 	<u>Representations</u> <ul style="list-style-type: none"> • Solving problems using graphs, tables and algebra

Topic Medium Term Plan Links:

Reasoning with Algebra

1. Straight Line Graphs
2. Forming and Solving Equations
3. Testing Conjectures

Constructing in 2 and 3 Dimensions

4. Three Dimensional Shapes
5. Constructions and Congruency

Reasoning with Number

6. Numbers
7. Using Percentages
8. Maths and Money

Reasoning with Geometry

9. Deduction
10. Rotation and Translation
11. Pythagoras' Theorem

Reasoning with Proportion

12. Enlargement and similarity
13. Solving ration and proportion problems
14. Rates

Representations

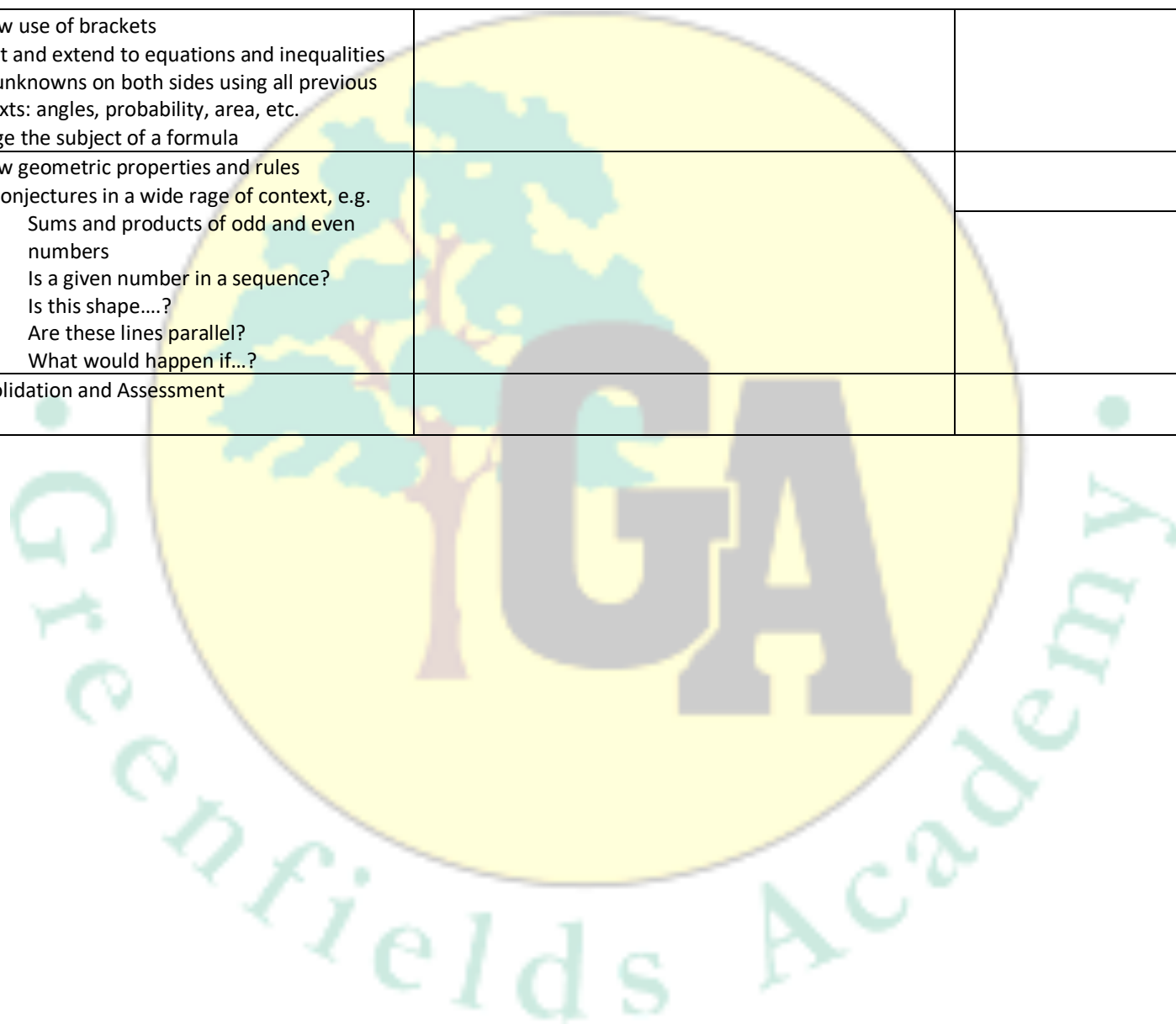
15. Solving problems using graphs, tables and algebra

Term 1

Weekly Sequence	New Learning & Knowledge	Key Question(s)	Whole School Focus (eg. Computing Week, Language Day)
1	<ul style="list-style-type: none"> • Link equations of graphs to solving equations • Revisit key topics through equations 	<ul style="list-style-type: none"> • Which axis is $y=4$ parallel to? How do you know? 	
2	<ul style="list-style-type: none"> • Interpret straight line graphs • Find and use the equation of a straight line • Reduce equations to the form $y = mx + c$ • Compare to linear sequences and finding the rule for the 'nth' term 	<ul style="list-style-type: none"> • All of the points on the line $y=x$ have something in common. What is it? • What is the equation of the x axis? • What is the equation of the y axis? • How does the function machine link to the equation? • If the x coordinate is ____, then what is the y coordinate? • If the y coordinate is ____, then what is the x coordinate? • If you know the equation of a line, how can you work out the value of y for a given value of x? How can you work out a value of x for a given value of y? • How does changing the coefficient of x in the equation of a line affect the line? • How can you tell from a graph if a line has a positive or negative gradient? How can you tell from the equation line? • What do you know if two lines have the same gradient? • What does it mean if the y-intercept of a straight line is positive / negative? • What does it mean if two lines have the same y intercept? • What are the coordinates of the y-intercept? What always stays the same? What changes? • Is it possible to have an x-intercept? 	

		<ul style="list-style-type: none"> • In $y=mx+c$, what do m and c represent? • In $y=mx+c$, what do x and y represent? • What does it tell us about two lines if they have the same gradient? What does it tell us about two lines if they have the same y-intercept? • Is the equation of the line given in the form $y=mx+c$? • From the given equation, can you find an expression for y? • Why is the form $y=mx+c$ more useful than other forms? • Are the lines $2y=4x$ and $y=2x$ parallel? How do you know? • How do you know from its graph if a line has a positive / negative gradient? • How do you know from its graph if a line has a positive / negative y intercept? • How do you work out the gradient of a line? How can you then find its equation? • Why does the table of values only have positive values? • What does the y-intercept represent? • What does the gradient represent? • Why does the graph not form a straight line? • Why does the graph never meet the axis? • Is it possible to build a house in 0 days? • Is it possible for a house to be built if there are 0 builders? • When two lines are perpendicular, why must one gradient be positive and one be negative? • What is the product of the gradients of a pair of perpendicular lines? 	
3	<ul style="list-style-type: none"> • Link equations of graphs to solving equations • Revisit key topics through equations 		

4	<ul style="list-style-type: none"> • Review use of brackets • Revisit and extend to equations and inequalities with unknowns on both sides using all previous contexts: angles, probability, area, etc. • Change the subject of a formula 		
5	<ul style="list-style-type: none"> • Review geometric properties and rules • Test conjectures in a wide range of context, e.g. 		
6	<ul style="list-style-type: none"> ○ Sums and products of odd and even numbers ○ Is a given number in a sequence? ○ Is this shape....? ○ Are these lines parallel? ○ What would happen if...? 		
7	<ul style="list-style-type: none"> • Consolidation and Assessment 		



Term 2

Weekly Sequence	New Learning & Knowledge	Key Question(s)	Whole School Focus (eg. Computing Week, Language Day)	
1 (8)	<ul style="list-style-type: none"> • Revisit estimation • Revisit rounding to the nearest integer, decimal places, significant figures • Revisit unit conversions, including area and volume units • Understand the language of faces, edges and vertices • Know the names of common prisms and non-prisms • Identify 2D shapes within 3D shapes • Work out the volume and surface area of cuboids and cylinders • Work out the volume of any prism • Work out missing lengths given area and/or volume 			
2 (9)				
3 (10)				
4 (11)		<ul style="list-style-type: none"> • Construct 3D shapes from nets and construct the net of a given 3D shape 		
5 (12)		<ul style="list-style-type: none"> • Construct and use scale drawings • Construct perpendicular bisectors 		
6 (13)		<ul style="list-style-type: none"> • Understand congruency • Exploring congruency via construction 		
7 (14)		<ul style="list-style-type: none"> • Consolidation and Assessment 		

Term 3

Weekly Sequence	New Learning & Knowledge	Key Question(s)	Whole School Focus (eg. Computing Week, Language Day)
1 (15)	<ul style="list-style-type: none"> • Revisit types of number – extend to include rational and real numbers 		
2 (16)	<ul style="list-style-type: none"> • Revisit fraction arithmetic • Add and subtract fractions (lowest common denominator) • Work out fractions of amounts • 		
3 (17)	<ul style="list-style-type: none"> • FDP equivalence • Ratio 		
4 (18)	<ul style="list-style-type: none"> • Revisit percentage increase and decrease • Use percentages over 100% • Find percentage changes • Use multipliers in a variety of contexts • Solve “reverse percentage” problems 		
5 (19)	<ul style="list-style-type: none"> • Explore financial mathematics including: <ul style="list-style-type: none"> ○ Bills and bank statements 		
6 (20)	<ul style="list-style-type: none"> ○ Interest ○ Unit Pricing (best buys) 		

Term 4

Weekly Sequence	New Learning & Knowledge	Key Question(s)	Whole School Focus (eg. Computing Week, Language Day)
1 (21)	<ul style="list-style-type: none"> Identify 2D and 3D shapes Link constructions and geometric reasoning 		
2 (22)	<ul style="list-style-type: none"> Revisit angles rules, including within special quadrilaterals Find angles using algebraic methods Use chains of reasoning to evaluate angles 		
3 (23)	<ul style="list-style-type: none"> Revisit fractions and directed number in the context of rotation 		
4 (24)	<ul style="list-style-type: none"> Compare and contrast rotational symmetry with line symmetry Identify 2D and 3D shapes Link constructions and geometric reasoning Identify the order of rotational symmetry of a shape Find the result of rotating angles Translate points and shapes by a given vector Understand variance and invariance in the context of transformations 		
5 (25)	<ul style="list-style-type: none"> Link constructions and geometric reasoning Identify the hypotenuse of a right-angled triangle 		
6 (26)	<ul style="list-style-type: none"> Determine whether a triangle is right-angled Calculate missing sides in right-angled triangles 		

Term 5

Weekly Sequence	New Learning & Knowledge	Key Question(s)	Whole School Focus (eg. Computing Week, Language Day)
1 (27)	<ul style="list-style-type: none"> • Links to ratio notation • Enlarge shapes by a positive scale factor, including from a given point • Revisit circumference • Calculate the lengths of missing sides in similar shapes 		
2 (28)			
3 (29)	<ul style="list-style-type: none"> • Direct proportion problems and graphs • Conversion graphs • Solve ratio problems given the whole or a part • Simple inverse proportion • Revisit unit pricing • Unit pricing problems (“best buys”) 		
4 (30)			
5 (31)	<ul style="list-style-type: none"> • Revisit $y = mx$ • Work with speed, distance, time • Solve problems involving density • Work with compound units 		
6 (32)			

Term 6

Weekly Sequence	New Learning & Knowledge	Key Question(s)	Whole School Focus (eg. Computing Week, Language Day)
1 (33)	<ul style="list-style-type: none"> • Revisit data measures, charts and graphs, including bivariate data, criticise misleading graphs • Revisit alternative representations of sequences – including finding algebraic rules • Revisit frequency trees and other representations, e.g. tables • Revisit conversion between standard form and ordinary form, and representing numbers as products of primes • Expand a pair of binomials • Create and interpret tables and timetables • Solve problems involving speed, distance and time • Solve inequalities on number lines, including error intervals • Represent word problems in a variety of forms (graphs, tables, expressions,...) • Interpret graphs (of any form (exponential, piece-wise m 		
2 (34)			
3 (35)			
4 (36)			
5 (37)			
6 (38)			
7 (39)			