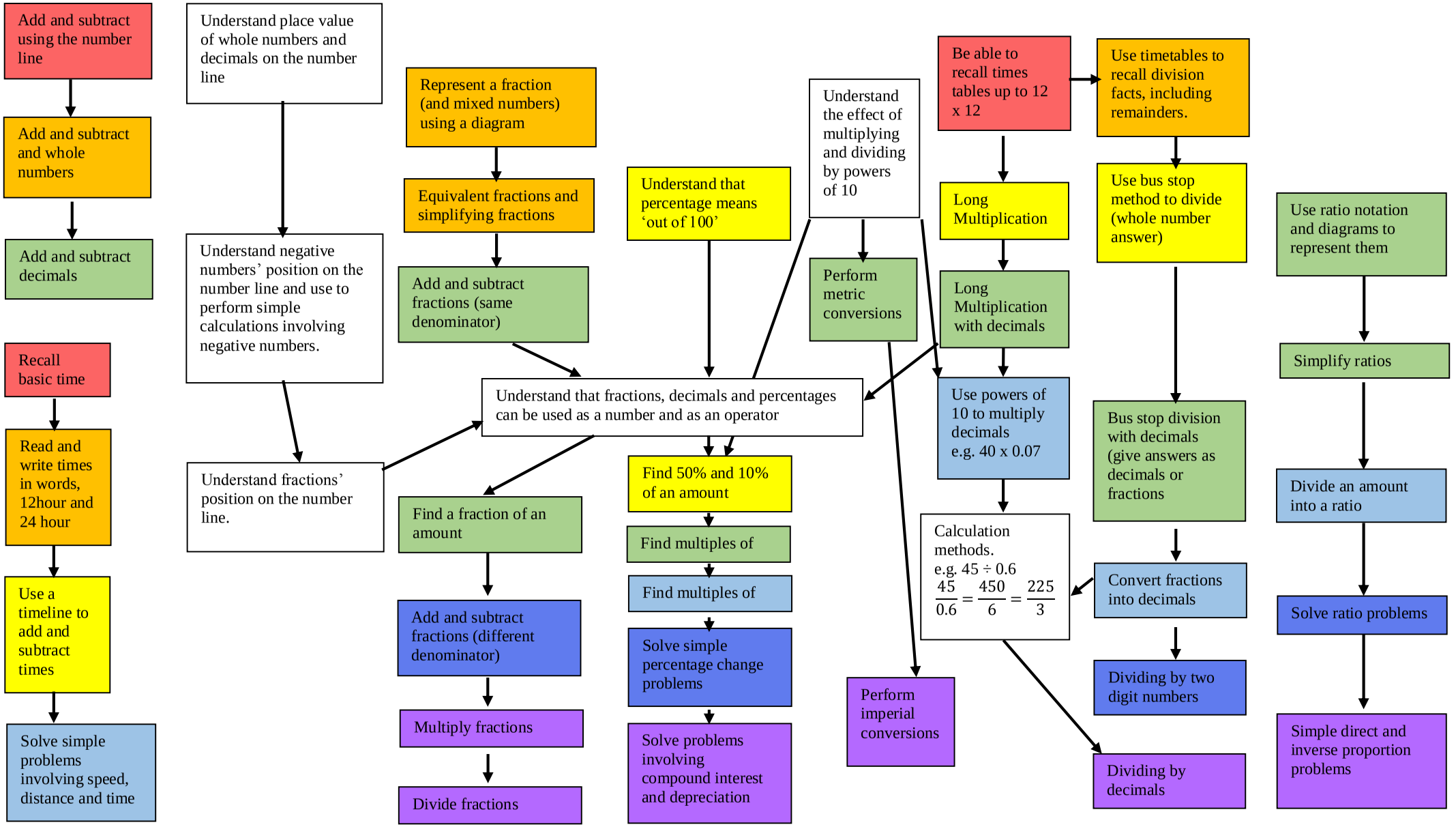
NOTRE DAME HIGH SCHOOL
NDHS
SURREY ST., NORWICH, NR1 3PB
MATHEMATICS

Year 8

Student Booklet

Name……

Rainbow Number - Colours



T1	Test Mark	/	6 Skills Target		Class Rank	
	Strength					Date Completed
	1st Target:					
	2nd Target:					

T2	Test Mark	/	6 Skills Target		Class Rank	
	Strength					Date Completed
	1st Target:					
	2nd Target:					

T3	Test Mark	/	6 Skills Target		Class Rank	
	Strength					Date Completed
	1st Target:					
	2nd Target:					

T4	Test Mark	/	6 Skills Target		Class Rank	
	Strength					Date Completed
	1st Target:					
	2nd Target:					

T5	Test Mark	/	6 Skills Target		Class Rank	
	Strength					Date Completed
	1st Target:					
	2nd Target:					

T6	Test Mark	/	6 Skills Target		Class Rank	
	Strength					Date Completed
	1st Target:					
	2nd Target:					

Number Objectives

Level	Number Properties & Calculations	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
4	Multiply by zero						
4	Understand how to use brackets in simple calculations						
5	Extend written methods to TU x TU and HTU x TU						
5	Use direct proportion in simple contexts						
5	Use ratio notation						
5	Find the prime factor decomposition of a number						
5	Multiply and divide negative integers by a positive number						
5	Reduce a ratio to its simplest form						
5	Add and subtract integers with varying numbers of significant figures						
5	Add and subtract negative integers from positive and negative integers						
5	Add and subtract integers – positive and negative numbers (with varying numbers of significant figures)						
5	Divide £.p by a two digit number to give £.p						
5	Estimate square roots of non square numbers less than 100						
5	Find equivalent ratios						
5	Find the HCF or LCM of 2 numbers less than 100						
5	Recognise the links between ratio and fractional notation						
5	Reduce a three part ratio to its simplest form by cancelling						
5	Solve simple problems using ratio expressed in words and in ratio notation						
5	Use the unitary method to solve simple word problems involving ratio						

Level	Number Properties & Calculations	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
6	Calculate squares, cubes and cube roots						
6	Multiply and divide integers - positive and negative numbers						
6	Add, subtract, multiply and divide integers. Extend to the distributive law $a(b+ c)$						
6	Establish index laws for positive powers where the answer is a positive power						
6	Find the prime factor decomposition of a number						
6	Understand that each of the headings in the place value system, to the right of the tens column, can be written as a power of ten						
6	Use the function keys for powers and fractions						
6	Combine laws of arithmetic for brackets with mental calculations of cubes roots and square roots						
6	Know the prefixes associated with 10^9, 10^6, 10^3 (giga, mega and kilo)						
6	Know the prime factorisation of numbers up to 30, giving answers as powers						
6	Show that any number to the power of zero is 1						
6	Use prime factor decomposition to find the HCF or LCM of 2 numbers						
7	Understand the order in which to calculate expressions that contain powers and brackets in both the numerator and denominator of a fraction						
7	Understand the effect of multiplying or dividing by any integer power of 10						
7	Round numbers to a given number of significant figures						
7	Use numbers of any size rounded to 1 significant figure to make standardized estimates for calculations with 1 step.						
7	Apply the index laws for multiplication and division of positive integer powers						

Level	Fractions, Decimals, Percentages & Ratio	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
4	Identify equivalent fractions.						
4	Extend mental methods of calculation to include percentages						
4	Calculate simple percentages						
5	Solve problems involving decimal numbers						
5	Choose the correct operation to use when solving decimal problems						
5	Be able to add and subtract more than two decimals with up to two decimal places, but with varying numbers of decimal places and using a mixture of operations within the calculation.						
5	Extend the possible decimals that can be used in mental calculations by using halving and doubling strategies.						
5	Use a diagram to compare two or more simple fractions with different denominators, and not unit fractions						
5	Begin to add and subtract simple fractions and those with simple common denominators						
5	Use percentages to compare simple proportions						
5	Calculate fractions of quantities and measurements						
5	Multiply decimals with two places by single-digit whole numbers						
5	Divide a quantity into two parts in a given ratio (whole numbers), where the answer is a decimal						
5	Add fractions by writing with a common denominator, where the denominators are 12 or less, where the answer is less than 1						
5	Understand that when two positive fractions are added the answer is larger than either of the original two fractions						
5	Simplify fractions by cancelling all common factors						
5	Express one number as a fraction of another (halves, quarters, thirds)						
5	Round and order decimals						
5	Multiply integers and fractions by a fraction						
5	Use mental strategies for multiplication – partitioning two 2 digit numbers where one number includes a decimal (both numbers have two significant figures)						
5	Multiply a fraction by an integer						
5	Subtract fractions by writing with a common denominator, where the denominators are less than 12 and the first fraction is larger than the second						
5	Express one given number as a percentage of another						
5	Know fractional equivalents to key recurring decimals e.g. 0.333333..., 0.66666666..., 0.11111…						
5	Add and subtract fractions with any size denominator						

Level	Fractions, Decimals, Percentages & Ratio	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
6	Find equivalent fractions, decimals and percentages.						
6	Work out a percentage increase or decrease						
6	Multiply and divide integers and decimals with up to two decimal places						
6	Divide a quantity in more than two parts in a given ratio, including decimal values						
6	Know the denominators of simple fractions that produce recurring decimals, and those that do not						
6	Multiply integers and decimals including by decimals such as 0.6 and 0.06, 0.t x 0.t or 0.t x 0.0h, 0.0h x 0.t and 0.0h x 0.0h						
6	Mentally be able to calculate the squares of numbers less than 16 multiplied by a multiple of ten, e.g. 0.2, 300, 0.400						
6	Express one number as a percentage of another						
6	Divide integers and fractions by a fraction						
6	Order fractions by converting them to decimals or equivalent fractions.						
6	Multiply or divide any number by 0.1 and 0.01						
6	Simplify a ratio expressed in decimals						
6	Calculate with mixed numbers						
6	Use an inverse operation						
6	Solve percentage problems						
6	Order positive and negative numbers, including decimals, as a list						
6	Round numbers to an appropriate degree of accuracy						
6	Use standard column procedures to add and subtract integers and decimals of any size						
6	Multiply and divide by decimals						
6	Use fractions and decimals within calculations including brackets						
7	Use the unitary method for an inverse operation						
7	Use > or < correctly between two negative decimals						
7	Find the reciprocal of a number						
7	Convert a recurring decimal to a fraction						
7	Calculate percentage change, using the formula 'actual change/original amount × 100' – where formula is given						
8	Calculate percentage change, using the formula 'actual change/original amount × 100' – where formula is recalled						
8	Calculate compound interest and repeated percentage change						

Unit 1 Objectives

Band	Shapes & Measures in 2D & 3D	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
Developing	Know and use names of 3D shapes	F					
	Identify 2D representations of 3D shapes	F					
	Identify a prism and know it has a constant cross section	F					
	Identify and count faces, edges, vertices	F					
	Identify nets of closed cubes and cuboids	F					
	Use nets to calculate the surface area of simple cuboids	F					
	Know the formulae for the volume of cube and a cuboid	F					
	Know and use geometric properties of cuboids and shapes made from cuboids	F					
Securing	Calculate areas of triangles, paralleleograms, trapezia	F/H					
	Calculate surface areas of cubes and cuboids	F/H					
	Use a ruler and compass to construct simple nets of 3D shapes	F/H					
	Identify nets of 3D shapes – regular and irregular polyhedra	F/H					
	Deduce properties of 3D shapes from 2D representations, including nets, 3D sketches and isometric drawings	F/H					
	Solve simple problems involving units of measurement in the context of length, area and capacity	F/H					
	Convert between metric and imperial measures, and cm^3 and litres.	F/H					
	Analyse 3D shapes informally and through cross-sections, plans and elevations	F/H					
	Be able to correctly identify the hypotenuse	F/H					
	Begin to use plans and elevations	F/H					
	Calculate areas of compound shapes	F/H					
	Calculate the surface area of shapes made from cuboids	F/H					
	Calculate the volume of shapes made from cuboids	F/H					
	Convert between larger volume measures to smaller ones (e.g. m^3 to cm^3)	F/H					
	Know the names of parts of a circle	F/H					
	Solve volume problems	F/H					
	Use the formula for the circumference of a circle	F/H					
	Use the formulae to find area of a circle, given the radius or diameter	F/H					
	Visualise and use a wide range of 2D representations of 3D objects	F/H					

Band	Shapes & Measures in 2D & 3D	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
Extending	Calculate the lengths and areas given the volumes in right prisms	H					
	Calculate the volume and surface area of right prisms	H					
	Given the coordinates of points A and B, calculate the length of AB	H					
	Know the formula for Pythagoras' theorem and how to substitute in values from a diagram	H					
	Use and apply Pythagoras' theorem to solve problems	H					
	Use the formulae for the area of a circle, given area, to calculate the radius or diameter	H					
	Calculate the lengths, areas and volumes in cylinders	H					

TEST 1

Unit 2 Objectives

Band	Statistics & Graphs	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
Developing	Calculate the mean from a simple frequency table, and using an assumed mean	F					
	Construct a frequency table for grouped discrete data and draw a graph	F					
	Construct compound bar graphs	F					
	Group data, where appropriate in equal class intervals	F					
	Interpret data from compound and comparative bar charts	F					
Securing	Interpret and construct pie charts	F/H					
	Interpret simple pie charts	F/H					
	Use experimentation to complete a data collection sheet, e.g. throwing a dice or data-logging	N/A					
	Use questionnaire responses to complete a data collection sheet	N/A					
	Find the modal class of a set of continuous data	F/H					
	Interpret scatter graphs, draw lines of best fit and use correlation	H					
	Use stem and leaf diagrams to find mode, median, mean, range	F/H					
	Use complex two way tables	F/H					
	Identify misleading graphs and statistics – choosing the appropriate reasons from a wide choice of options, or writing their own reasons.	F/H					
Extending	Interpret information from a complex real life graph, read values and discuss trends	H					
	Discuss and interpret linear and non linear graphs from a range of sources	H					
	Draw, use and interpret conversion graphs	H					
	Discuss and interpret real-life graphs	H					
	Draw and use graphs to solve distance-time problems	H					
	Extend a proportion or relationship beyond known values (given proportion graphically or in words)	H					
	Plot a simple straight line graph (distance-time)	H					
	Plot the graphs of a function derived from a real life problem	H					
	Recognise graphs that show direct proportion	H					
	Solve problems involving direct proportion with a graph	H					
	Recognise graphs showing constant rates of change, average rates of change and variable rates of change	H					

TEST 2

Unit 3 Objectives

Band	Expressions & Equations	Assessment	*I can do this already*	*Covered in Class*	Strength?	Revised it?	Aced it
Developing	Use distributive law with brackets, with numbers	F					
	Understand the difference between an expression and an equation and the meaning of the key vocabulary 'term'	F					
	Use arithmetic operations with algebra	F					
	Begin to multiply a positive integer over a bracket containing linear terms, e.g. $4(x + 3)$	F					
	Simplify more complex linear algebraic expressions by collecting like terms, e.g. $x + 7 + 3x$, $2b – 3a + 6b$	F					
	Know that expressions can be written in more than one way, e.g. 2 x 3 + 2 x 7 = 2(3 + 7)	F					
	Find outputs and inputs of simple functions expressed in words or symbols using inverse operations	F					
	Construct functions (completing a number machine)	F					
	Understand and identify the unknowns in an equation	F					
	Solve simple linear equations with integer coefficients, of the form $ax = b$ or $x +/– b = c$, e.g. $2x = 18$, $x + 7 = 12$ or $x – 3 = 15$	F					
Securing	Substitute integers into formulae and solve for missing values one-step equations	F/H					
	Substitute solution back into equation to check it is correct	F/H					
	Construct and solve linear equations	F/H					
	Simplify simple expressions involving powers	F/H					
	Multiply a single term over a bracket e.g. $x(x + 4)$, $3x(2x – 3)$	F/H					
	Use the distributive law to take out numerical common factors	F/H					
	Substitute positive and negative integers into linear expressions and expressions involving powers	F/H					

Band	Expressions & Equations	Assessment	*I can do this already*	*Covered in Class*	Strength?	Revised it?	Aced it
Extending	Simplify simple expressions involving powers, but not brackets, by collecting like terms	H					
	Simplify simple expressions involving index notation, i.e. $x^2 + 2x^2$, $p \times p^2$, $r^5 \div r^2$	H					
	Know and understand the meaning of an identity and use the identity sign	H					
	Simplify expressions involving brackets and powers e.g. $x(x^2 + x + 4)$, $3(a + 2b) - 2(a + b)$	H					
	Establish index laws for positive powers of variables where the answer is a positive power	H					
	Use the distributive law to take out single term algebraic factors, e.g. $x^3 + x^2 + x = x(x^2 + x + 1)$	H					
	Construct and solve equations that involve multiplying out brackets by a negative number and collecting like terms (e.g. $4(2a - 1) = 32 - 3(2a - 2)$)	H					
	Apply the index laws for multiplication and division of small integer powers, e.g. $a^3 \times a^2$, $x^3 \div x^2$	H					
	Know and use the general forms of the index laws for multiplication and division of positive integer powers. (e.g. $pa \times pb$, $pa \div pb$, $(pa)b$)	H					

TEST 3

Unit 4 Objectives

Band	Angles & Construction	Assessment	*I can do this already*	*Covered in Class*	Strength?	Revised it?	Aced it
Developing	Use a protractor to measure reflex angles to the nearest degree	F					
	Use correct notation for labelling triangles	F					
	Use a protractor to draw obtuse angles to the nearest degree	F					
	Use a protractor to draw reflex angles to the nearest degree	F					
	Calculate angles around a point	F					
	Identify interior and exterior angles in a shape	F					
	Know the sum of angles in a triangle	F					
	Calculate angles in a triangle	F					
Securing	Recognise and use vertically opposite angles	F/H					
	Use a ruler and protractor to construct a triangle given two sides and the included angle (SAS)	F/H					
	Use a ruler and protractor to construct a triangle given two angles and the included side (ASA)	F/H					
	Use straight edge and compass to construct a triangle, given three sides (SSS)	F/H					
	Use ruler and protractor to construct simple nets of 3D shapes, using squares, rectangles and triangles, e.g. square-based pyramid, triangular prism	N/A					
	Investigate triangles using Pythagoras' theorem	N/A					
	Classify quadrilaterals by their geometric properties	F/H					
	Understand a proof that the sum of the angles of a triangle is 180° and of a quadrilateral is 360°	F/H					
	Solve geometric problems using side and angle properties of triangles and special quadrilaterals	F/H					
	Identify alternate angles and corresponding angles	F/H					
	Calculate the interior and exterior angles of regular and irregular polygons	F/H					
	Solve geometrical problems showing reasoning	F/H					

Band	Angles & Construction	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
Extending	Solve problems involving angles by setting up equations and solving them	H					
	Use straight edge and compass to construct the mid-point and perpendicular bisector of a line segment	H					
	Use straight edge and compass to construct the bisector of an angle	H					
	Use straight edge and compass to construct the perpendicular from a point on a line segment	H					
	Use straight edge and compass to construct a triangle, given right angle, hypotenuse and side (RHS)	H					
	Use straight edge and compass to construct the perpendicular from a point to a line segment	H					
	recognise and use the perpendicular distance from a point to a line as the shortest distance to the line	H					
	Draw the locus equidistant between 2 points or from a point	H					
	Draw the locus equidistant between 2 lines	H					
	know that all the points equidistant from a single point in space form the surface of a sphere	H					
	Draw the locus equidistant from a line and around a rectangle	H					
	Produce shapes and paths by using descriptions of loci	H					
	Use construction to find the locus of a point that moves according to a rule	H					

TEST 4

Unit 5 Objectives

Band	Probability	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
Developing	Use the vocabulary of probability	F					
	Use a probability scale with words	F					
	Understand and use the probability scale from 0 to 1	F					
	Identify all possible mutually exclusive outcomes of a single event	F					
	Find and justify probabilities based on equally likely outcomes in simple contexts	F					
	Know that if probability of event is p then probability of event not occurring is $1 - p$	F/H					
Securing	Identify all mutually exclusive outcomes for two successive events with two outcomes in each event	F/H					
	Estimate probabilities based on given experimental data	F/H					
	When interpreting results of an experiment, use vocabulary of probability	F/H					
	Use the language of probability to compare the choice of x/a with y/a	F/H					
	Estimate probabilities based on data (collected from a simple experiment)	F/H					
	Calculate the probability of the final event of a set of mutually exclusive events	F/H					
	Identify all mutually exclusive outcomes for two successive events with two or three outcomes in each event	F/H					
	Use the vocabulary of probability to assign probability to events.	F/H					
Extending	Know how to calculate relative frequency	H					
	Use relative frequency to make estimates	H					
	Apply estimated probabilities to future data	H					
	Identify conditions for a fair game	H					
	Calculate the probability of a combination of events or single missing events of a set of mutually exclusive events using 'sum of outcomes = 1'	H					
	Understand relative frequency as an estimate of probability and know when to add or multiply probabilities	H					
	Plot and use relative frequency diagrams, and recognise that with repeated trials experimental probability tends to a limit	H					
	Draw and use tree diagrams to represent outcomes of two independent events and calculate probabilities	H					
	Calculate the probability of independent and dependent events	H					

TEST 5

Unit 6 Objectives

Band	Straight Lines & Functions	Assessment	I can do this already	Covered in Class	Strength?	Revised it?	Aced it
Developing	Find midpoints of line segments	F/H					
	Find gradients of lines	F/H					
	Plot the graphs of linear functions	F/H					
	Plot the graphs of linear functions in the form $y = mx + c$ and recognise and compare their features	F/H					
Securing	Recognise that linear functions can be rearranged to give y explicitly in terms if x e.g. rearrange $y + 3x – 2 = 0$ in the form $y = 2 – 3x$	F/H					
	Find the inverse of a linear function such as $x \rightarrow 2x + 5$, $x \rightarrow 2(x – 3)$, $x \rightarrow (x + 2)/4$, $x \rightarrow 5x – 4$	F/H					
	Recognise the graph of the inverse of simple linear functions	F/H					
	Identify and describe examples of direct proportion	F/H					
	Solve problems involving direct proportion	F/H					
	Recognise geometric sequences and appreciate other sequences that arise	F/H					
	Know and use $y = mx + c$ for any straight line	F/H					
	Recognise that straight line graphs can be written in the form $y = mx + c$	F/H					
Extending	Without drawing the graphs, compare and contrast features of graphs such as $y = 4x$, $y = 4x + 6$, $y = x + 6$, $y = –4x$, $y= x – 6$	H					
	Write the equations of straight line graphs in the form $y = mx + c$	H					
	Be able to work out when a point is on a line	H					
	Know for a straight line $y = mx + c$, m is the gradient and m = (change in y)/(change in x)	H					
	Recognise that any line parallel to a given line will have the same gradient.	H					
	Know that a line perpendicular to the line $y = mx + c$, will have a gradient of $–1/m$	H					
	Recognise that when the linear and inverse of a linear function such as $y = 2x$, $y = 3x$ are plotted, they are a reflection in the line $y = x$	H					
	Recognise when lines are parallel or perpendicular from their equations	H					
	Find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear , exponential and reciprocal graphs	H					
	Recognise when lines are parallel and where a line crosses the y-axis from the equation of the line	H					

TEST 6