Brymore

experience to last a lifetime

Mathematics

Scheme of Learning 2017 -18

Year 7 to 11

Old KS3	Old GCSE	New Points
b		-20
1		-16
2c		-12
2b		-8
2a		-5
3c	G3	-2
3b	G2	1
3a	G1	4
4c	F3	7
4b	F2	10
4a	F1	13
5c	E3	17
5b	E2	20
5a	E1	23
6c	D3	27
6b	D2	30
6b	D2	34
6a	D1	37
7c	C3	40
7b	C2	45
7a	C1	50
8c	B3	55
8b	B2	60
8a	B1	66
	A3	71
	A2	77
	A1	83
	A*3	89
	A*2	94
	A*1	99

Mathematical Formulae

1 Students are expected to know the following formulae included in the subject content and the will **NOT** be given in the exam.

Quadratic Formula

The solutions of $ax2 + bx + c$, where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Circumference and Area of a Circle

Circumference of a Circle = $2\pi r$ or πd

Area of a Circle = πr^2

Pythagoras Theorem

In any right- angled triangle where a, b and c are lengths of the sides and c is the hypotenuse

$$a^2 + b^2 = c^2$$

Trigonometry Formulae

In any right angles triangle ABC where a, b and c are lengths of the sides and c is the hypotenuse

Sin A = $\frac{a}{c}$ cos A = $\frac{b}{c}$ tan A = $\frac{a}{b}$

In **any** triangle where a, b and c are lengths of the sides

sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

cosine rule : $a^2 = b^2 + c^2 - 2bc \cos A$

Area of a triangle: $\frac{1}{2} ab \sin C$

2 Students are expected to know the following formulae or be able to derive; they will **NOT** be given in the exam.

Perimeter, Area Surface Area and Volume Formulae

Where a and b are the lengths of the parallel sides and n is the perpendicular separation.

Area of a trapezium: $\frac{1}{2}(a + b)h$

Volume of a prism: **Area of cross section x length**

Compound Interest

Where P is the principle amount, r is the interest rate over a given period and n is the number of times the interest is compounded.

Total accrued = $P\left(1 + \frac{r}{100}\right)^n$

Probability

Where P(A) is the probability of outcome A and P(B) is the probability of outcome B P(A or B): P(A) + P(B) – P(A and B)

P(A and B): P(A given B) P(B)

3 Students are **NOT** expected to memories the following formulae; they will be given in the exam in the relevant question

Perimeter, Area Surface Area and Volume Formulae

Where r is the radius of the sphere or cone, *l* is the slant height and h the perpendicular height of a cone

Curved surface area of a cone: πrl

Surface area of a sphere: $4\pi r^2$

Volume of a cone: $\frac{1}{3}\pi r^2 h$

Volume of a sphere: $\frac{4}{3}\pi r^3$

Kinematics Formulae

Where a is constant acceleration, u is initial velocity, s is displacement from the position when t = 0 and t is the time taken.

$v = u + at$

$s = ut + \frac{1}{2}at^2$

$v^2 = u^2 + 2as$

Mathematics Units

Operations
All About Number
Measures and Accuracy
Literacy of Algebra & Graphs
Formula and Sequences
Rates of Change and Proportion
Percentages
Perimeter, Area and Volume
Properties of Shapes
Angles and Construction
Transforming Shapes & Vectors
Probability
Handling Data

Calendar for Years 7 to 11

Number	Algebra	Ratio	Geometry	Probability	Statistics

There is a 2 year rolling programme of topics, with 4 topics being taught once and picked up again in year 11.
Here are the topics only taught once

• Formula & Sequences	• Transformations
• Angles & Construction	• Probability

Year 7	Year 8	Year 9	Year 10	Year 11
Operations	All About Number	Operations	All About Number	Literacy of Algebra
½ Term				
Literacy of Algebra	Literacy of Algebra	Literacy of Algebra	Literacy of Algebra	Probability
				Transformations
Christmas				
Probability	Handling Data	Angles & Construction	Handling Data	Angles & Construction
½ Term				
Perimeter Area Volume	Transformations	Perimeter Area Volume	Formula & Sequences	Revision
Easter				
Percentages	Measures & Accuracy	Percentages	Measures & Accuracy	Revision
				EXAM
½ Term				
Properties of Shape	Rates of Change & Proportion	Properties of Shape	Rates of Change & Proportion	EXAM

Number

There are 3 number units

Unit 1 Operations

- Integers
- Decimals
- Fractions
- Powers and Roots
- Standard Form
- Irrational Numbers

Unit 2 All About Number

- Place Value
- Powers and Roots
- Types Of Numbers
- Comparing Numbers

Unit 2 Measures & Accuracy

- Rounding and Estimating
- Checking Calculations
- Measures
- Units of Measures
- Accuracy

Number 1 – Operations

Areas covered:

Integers	P	F		
Decimals	P	F		
Fractions	P	F		
Power & Roots			I	H
Standard Form		F		
Irrational Numbers			I	H

Number Operations

Prepare		
Add and subtract number of objects up to 10	**1**	
Understand the four operations we use and know and use the inverses	**2**	**G**
Know and recall time tables up to 12 x 12 and corresponding division facts	**4**	**G**
Begin to use decimal notation in contexts such as money	**3**	**E**
Begin to use halves and quarters	**2**	
Foundation – grade 2		
Use and apply the four operations to integers including formal written methods	**5**	**F**
Multiply and divide by powers of 10		
Leave remainders when dividing as fractions - Calculate exactly with fractions	**4**	**F**
Use relationships between operations & inverse operations to simplify calculations	**4**	**F**
Calculate half way values		
Add and subtract small negative numbers	**4**	**F**
Use all four operations to decimal places with 2 decimal places	**4**	**F-E**
Use all four operations using money	**4**	**F**
Use simple fractions of parts and recognise when two fractions are equivalent	**3**	**G**
Reduce a fraction to its simplest form by cancelling	**5**	**F**
Add and subtract fractions with same or similar denominators	**6**	**D**
Foundation – grade 3		
Use and apply the four operations to positive and negative numbers	**4**	**F**
Use conventional notation for priority of operations (BIDMAS BODMAS)	**4**	**F**
Know and recall all the square numbers up to 15 x 15	**4**	**F**
Know and recall all the square roots of the square numbers up to 225	**4**	**F**
Make and justify estimates and approximations to calculations	**7**	**C**
Use and apply the four operations to decimals including formal written methods	**4**	**F-C**
Understand the effects of multiplying and dividing by numbers between 1 and 0	**7**	**C**
Use and apply the four operations to simple fractions	**6**	**E**
Use and apply the four operations to improper fractions and mixed number fractions	**7**	**C**
Calculate fractions of amounts	**5**	**F**
Find the reciprocal of a number	**7**	**C**
Calculate with an interpret standard from **$A \times 10^n$** where $1 \leq A < 10$, and n is an integer	**8**	**B**
Understand place value when calculating with very large or very small numbers	**8**	**B**
Intermediate – grade 4		
Calculate roots and estimate square roots using understanding of square numbers	**7**	**D**
Use and apply the laws of positive indices	**7**	**B**
Intermediate – grade 5		
Calculating with bounds	**8**	**A**
Use and apply the laws of negative indices	**8**	**A**
Use and apply mathematical reasoning		
Use and apply error intervals	**8**	**A**
Higher – grade 7		
Calculate with fractional indices	**9**	**A**
Higher – grade 8 9		
Calculate exactly with surds	**10**	**A***
Rationalise denominators	**9**	**A**
Using bounds in complex mathematical problems	**9**	**A**
Simplify surd expressions involving squares e.g. $\sqrt{12} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$	**10**	**A***

Number 2 – All About Number

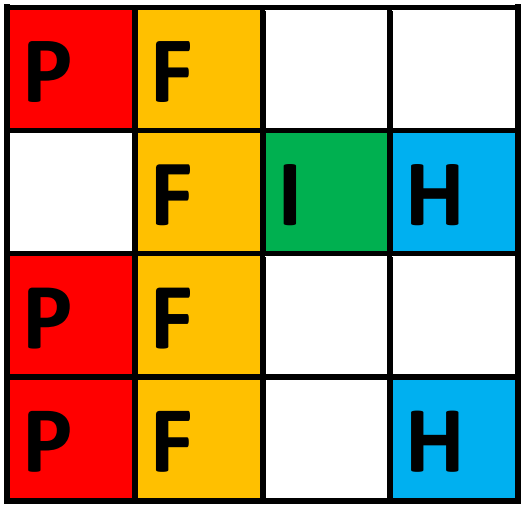
Area covered:

Place Value

Powers and Roots

Types of Number

Comparing Numbers



All About Number

Prepare		
Understand place value of integers		
Order numbers integers	**1**	
Understand odd and even numbers		
Introduction to positive and negative numbers	**2**	**G**
Foundation – grade 1		
Order positive and negative integers	**3**	**G**
Order decimals	**3**	**G**
Understand the place value of a digit including decimals	**4**	**F**
Use the symbols, =, ≠, ≈, <, >, ≤, and ≥	**3**	
Foundation – grade 2		
Recognise negative numbers in contexts such as temperature	**3**	**G**
Recognise and describe number relationships • Multiples • Factors • Primes • Squares	**4**	**G**
Use and calculate positive inter powers and associate real roots	**4**	**F-E**
Know and recognise square number up to 15^2 and cube up to 5^3	**5**	**D**
Recognise powers of 2, 3, 4 and 5	**5**	**D**
Use the concepts and vocabulary of prime numbers, factors (divisors) and multiples	**4**	**G**
Foundation – grade 3		
Calculate and understand square numbers up to 10 x 10	**4**	**F**
Ordering fractions		
Compare simple fractions, decimals & percentages	**5**	**F**
Order simple fractions, decimals and percentages	**5**	**E**
Find common factors and common multiples	**7**	**C**
Prime factor decomposition, including product notation and the unique factorisation theorem	**7**	**C**
Find LCM HCF	**7**	**C**
Apply systematic listing strategies		
Order decimals and fractions	**4**	**F**
Interchange terminating decimals with their corresponding fractions • 3.5 & $^7/_2$ • 0.375 & $^3/_8$	**6**	**D**
Interpret fractions and percentages as operators	**6**	**D**
Calculate with roots and with integers powers	**7**	**C**
Using place value	**5**	**D**
Intermediate – grade 4		
Rules of indices	**8**	**B**
Intermediate – grade 5		
Negative Indices	**8**	**B**
Higher – grade 6		
Change recurring decimals into their corresponding fractions and vice versa	**8**	**B**
Higher – grade 7		
Calculate with fractional indices	**9**	**A**

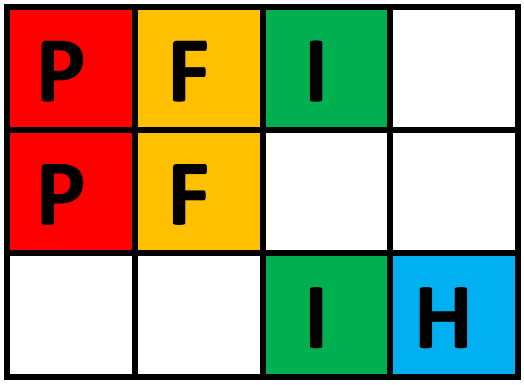
Number 3 – Measures & Accuracy

Areas covered:

Rounding & Estimating

Measuring

Accuracy



Measures & Accuracy

Prepare		
Round to the nearest integer	**3**	**G**
Begin to use a wider range of measures including metric and imperial units to measure length and mass	**2**	**G**
Measure line accurately to the nearest mm	**2**	**G**
Use conversion graphs		
Foundation – grade 1		
Read and interpret scales on a range of measuring instruments explaining what each labelled division represents	**5**	**F**
Use map scales to find distance	**6**	**E**
Foundation – grade 2		
Round to the nearest 10, 100 , 1000 etc.	**3**	**G/F**
Round numbers to stated number of decimal places.	**5**	**F**
Measure angles accurately to the nearest degree	**5**	**F**
Measure line segments and angles in geometric figures accurately.	**4**	**G**
Interpret maps and scale drawings.	**5**	**F**
Foundation – grade 3		
Round numbers to significant figures.	**7**	**B**
Round numbers and measures to appropriate degree of accuracy.	**6**	**D**
Check calculations using approximation and estimation.	**7**	**C**
Use and apply 8 compass point and 3 figure bearings.	**6**	**D**
Use standard units of mass, length, time, money – using decimals correctly where appropriate.	**3**	**G**
Intermediate – grade 4		
Use standard compound measures - using decimals correctly where appropriate.	**7**	**C**
Use inequality notation to specify simple error intervals due to truncation or rounding.		
Apply and interpret limits of accuracy.	**7**	**C**
Calculations involving lower and upper bounds.	**7**	**C**
Plot and interpret graphs of kinematic problems involving distance, speed and acceleration	**5-7**	**F-C**
Higher – grade 8 9		
Apply understanding of bounds to problem questions	**9**	**A**
Find the area under non-linear graphs		
Use gradients and area under graphs to interpret results of distance time graphs, velocity time graphs and graphs in financial contexts		

Algebra

There are 2 Algebra units

Unit 1 Language of Algebra & Graphs

- Notation & Vocabulary
- Expressions
- Equations
- Graphs

Unit 2 Formulae & Sequences

- Formulae
- Sequences

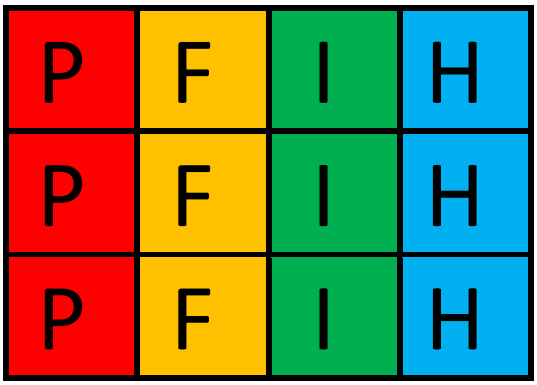
Algebra 1 – Language of Algebra & Graphs

Areas covered:

Expressions

Equations

Graphs



Language of Algebra & Graphs

Prepare		
Recognise expressions as sentences, equations as questions and formulae as quotes		
Identify and use key words appropriately term, simplify, solve, substitute, expand		
Know, use and understand that 1x is written just as x		
Simplify expression with one variable such as a + 2a + 7a	5	F
Plot coordinates in the first quadrant	4	G
Plot simple algebra graph x = 2, y = 3, y = x + 1, y = 2x	6	E
Foundation – grade 2		
Simplify expression with more than one variable such as a + 2b + 7a - b	6	E
Substitute numbers into an expression	4	E
Use and interpret algebraic notation ab in place of a x b	4	E
Use and interpret algebraic notation 3y in place of y + y + y and 3 x y	4	E
Use and interpret algebraic notation a^2 in place of a x a and a^3 in place of a x a x a	4	E
Use and interpret algebraic notation a/b in place of a ÷ b	4	E
Use and interpret algebraic notation coefficients written as fractions rather than decimals	4	E
Understand and use concepts and vocabulary of expressions, equations, formulae, inequalities terms and factors	4	E
Simplify and manipulate algebraic expressions by collecting like terms	6	E
Foundation – grade 3		
Solve one step equations $2x = 12$ $x + 2 = 8$ $\frac{x}{3} = 4$	5	F
Use and interpret algebraic notation brackets		
Substitute numerical values into formula and expressions – including scientific formula	4	E
Expand a term over a single bracket	5	D
Factorise simple algebraic expressions by taking out common factors	6	D
Work with coordinates in all four quadrants	5	F
Plot the graphs of equations that correspond to straight line graphs in the coordinate plane	6	E
Find approximate solutions to linear equations using a graph	7	C
Identify and interpret gradients and intercepts of linear functions graphically and algebraically	7	C
Recognise, sketch and interpret graphs of linear functions and quadratic functions	8	B
Intermediate – grade 4		
Simplify expressions involving sums, products and powers including the laws of indices	7	C
Solve linear equations in one unknown algebraically with x on one side	5	E
Solve linear equations in one unknown algebraically with x on both sides	6	D
Solve linear equations in one unknown algebraically with brackets	6	D
Solve linear equations in one unknown algebraically with fractional answers		
Construct and solve equations to problem solve	6	E
Simplify and manipulate algebraic expressions by expanding products of two binomials	7	C
Argue mathematically to show algebraic expressions are equivalent and use algebra to support and construct arguments	5-7	C-B
Solve linear inequalities in one variable	7	C
Represent the solution set on a number line	8	B
Use the form y = mx + c to identify parallel lines	7	C
Solve linear inequalities in one variable	8	B
Solve linear inequalities in one or two variables	9	A

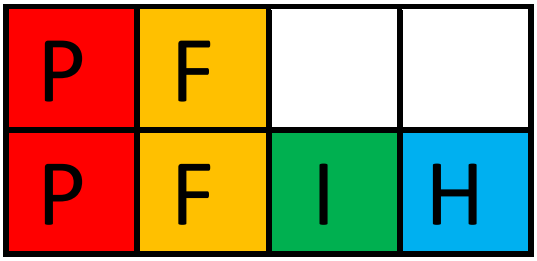
Intermediate – grade 5		
Simplify and manipulate algebraic expressions by factorising quadratic expressions in the form $x^2 + bx + c$	8	B
Simplify and manipulate algebraic expressions by factorise using the difference of two squares	8	B
Simplify and manipulate algebraic expressions by using a difference of two squares including those involving surds	9	A
Solve quadratic equations algebraically by factorising	8	B
Find approximate solutions to quadratic equations using a graph		
Solve two linear simultaneous equations with two variable algebraically	7	B
Derive an equation (or 2 simultaneous equations), solve the equation(s) and interpret the solution		
Solve two linear simultaneous equations with two variables algebraically	8	B
Find the equation of the line through 2 given points	7	C
Find the equation of a line given 1 point and the gradient	7	C
Identify and interpret roots, intercepts and turning points of quadratic functions graphically	8	B
Deduce roots graphically	8	B
Recognise, sketch and interpret cubic functions and the reciprocal function $y = \frac{1}{x}$ with $x \neq 0$	8	B
Recognise, sketch and interpret other reciprocal functions	8	B
Higher – grade 6		
Simplify and manipulate algebraic expressions by expanding products of three binomials	5-7	C-A
Find approximate solutions to equations numerically using trial & improvement	7	C
Find approximate solutions to equations numerically using iterative methods		
Higher – grade 7		
Factorising quadratics in the form $ax^2 + bx + c$	8	B
Simplify algebraic fractions		
Argue mathematically to show algebraic expressions are equivalent and use algebra in proof	9	A
Solve quadratic equations that need rearranging by factorising		
Solve quadratics by using the quadratic formula	10	A*
Represent the solution set on a number line, using set notation and on a graph		
Understand when graphing regions, the convention of dashed lines for strict inequalities and solid line for included inequalities		
Recognise, sketch and interpret exponential functions $y = k^x$ for positive values of k	10	A*
Recognise, sketch and interpret trigonometric functions with arguments in degrees.	8	A*
Sketch translations and reflections of a given function	8	A
Recognise, sketch and interpret exponential graphs	10	A*
Recognise and use the equation of a circle with centre at the origin	9	A
Higher – grade 8 9		
Solve quadratic equations by completing the square	10	A*
Solve two linear simultaneous equations with two variables when one is a quadratic function	9	A
Interpret expressions as functions and interpret the reverse process as the “inverse function”		
Interpret the succession of two functions as a “composite function”		
Use the form $y = mx + c$ to identify perpendicular lines	7	C
Deduce turning points by completing the square		
Calculate or estimate gradients of non-linear graphs		
Find the equation of a tangent to a circle at a given point		
Understand and use notation of $f(x)$, $fg(x)$ and $f^{-1}(x)$		

Algebra 2 – Formulae & Sequences

Areas covered:

Formulae

Sequences



Formula & Sequences

Prepare		
Begin to use formulas in words	4	G
Construct in symbolic form and use simple formulae involving one or two operations	5	F
Substitute positive numbers into simple formulas	4	F
Recognise sequence in pictures	1	
Recognise simple sequences in numbers	2	
Continue arithmetic sequences by noticing pattern	3	G
Foundation – grade 2		
Generate terms of a sequence from term to term rule	6	E
Write down terms of a simple sequence	3	G
Understand sequences in picture form	3	F
Substitute a variety of numbers into simple formulae including fractions, decimals and negative numbers	4	D
Understand and use standard mathematical formulae		
Foundation – grade 3		
Substitute into complex formulas example $C = \frac{(A + 1)D}{9F}$	6	D
Substitute into complex formulas including fractions, decimals and negative numbers	8	B
Rearrange formula to change the subject using flow charts	7-8	C-B
Generate terms of a sequence from position to term rule	6	E
Recognise and use sequences of triangular, square and cube numbers and simple arithmetic progressions	5	F
Deduce expressions to calculate the nth term of a linear sequence	7	C
Intermediate – grade 4		
Recognise and use Fibonacci type sequences		
Recognise and use quadratic sequences	8	B
Intermediate – grade 5		
Recognise and use simple geometric progressions (r^n when n is an integer, r is a rational number > 0)		
Higher – grade 7		
Rearrange formula to change the subject (complex)		
Higher – grade 8 9		
Find the nth term of a quadratic sequence		
Recognise and use simple geometric progressions (r^n when n is an integer where r is a surd)		

Ratio

There are 2 Ratio units

Unit 1 Rates of Change

- Scales & Measures
- Ratio
- Proportion
- Graphical Rates of Change

Unit 2 Percentages

- Percentages

Ratio 1 – Rates of Change

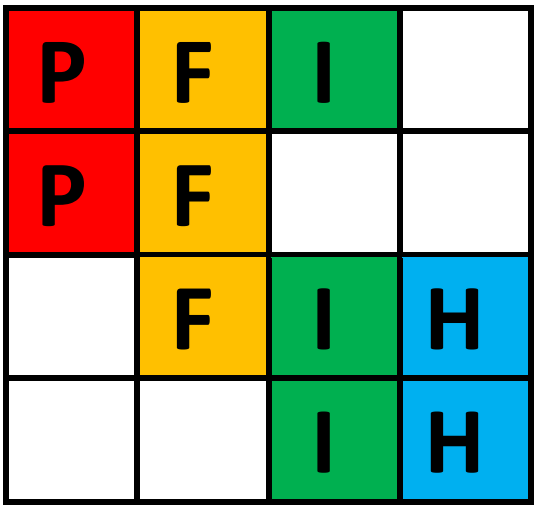
Areas covered:

Scales & Measures

Ratio

Proportion

Graphical Rates of Change



Rates of Change

Prepare		
Begin to understand simple ratio in picture form	4	F
Use appropriately the standard units of	4	F
• Time	4	F
• Length	4	F
• Area	4	F
• Volume/capacity	4	F
• Mass	4	F
Foundation – grade 2		
Cancel down ratios into simplest form	4	F
Calculate simple best values	5	E
Calculate ingredients for simple recipes	5	E
Solve simple problems dividing a number into a given ratio	4	F
Use scale factors, scale diagrams and maps including geometric problems	6	D
Compare lengths, areas and volumes using ratio notation	8	B
Foundation – grade 3		
Divide a quantity into two or more parts in a given part : part	5	E-D
Divide a quantity into two or more parts in a given part : whole	5	E-D
Apply ratio to context and problems in exchange rates	6	D
Express a multiplicative relationship between two quantities as a ratio or a fraction		
Understand and use proportion as equality of ratios	6	D
Intermediate – grade 4		
Calculate lengths in similar shapes	7	C
Change freely between and use related compound units	7	C
Interpret the gradient of a straight line graph as a rate of change	8	B
Higher – grade 7		
Understand similarity in area and volume of shapes	9	A
Understand that x is inversely proportional to y is equivalent to x is proportional to1/y	9	A
Interpret equations that describe direct and inverse proportion	9	A
Construct and interpret equations that describe direct and inverse proportion	9	A
Recognise and interpret graphs that illustrate direct and inverse proportion	9	A

Ratio 2 – Percentages

Areas covered:

Percentages

Percentages

Prepare		
Calculate simple percentages using none calculator methods • 10% • 20% • 5% • 15% • 50% • 25% • 75%	5	F
Simple percentage increase decrease	5	E
Foundation – grade 2		
Define a percentage as “a number of parts per 100”	4	F
Interpret percentages and percentage change as a fraction or a decimal and interpret these multiplicatively		
Calculate a percentage of a quantity	4	F
Express one quantity as a percentage of another	6	C
Compare two quantities using percentages	6	C
Foundation – grade 3		
Work with percentages greater than 100		
Solve problems including percentage increase decrease	6	D
Solve problems including percentage change	6	C
Solve problems including fining original value	8	B
Solve problems including simple interest in financial mathematics	6	C
Work with percentages greater than 100		
Intermediate – grade 5		
Set up, solve and interpret the answer in growth and decay problems including compound interest (profit and loss)	8	B
Set up, solve and interpret the answer in growth and decay problems including compound interest and work with iterative processes	9	A
Higher – grade 6		
Application of percentage questions in real life situations		

Geometry

There are 4 Geometry units

Unit 1 Perimeter, Area & Volume

- Perimeter
- Area
- Volume

Unit 2 Properties of Shapes

- Notation & Conventions
- Properties of Shapes
- Pythagoras and Trigonometry

Unit 3 Angles & Construction

- Angles
- Construction

Unit 4 Transformation of Shapes & Vectors

- Transformation
- Vectors

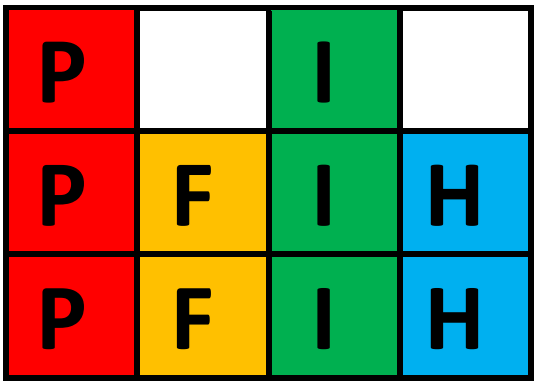
Geometry 1 – Area, Perimeter Volume

Areas covered:

Perimeter

Area

Volume



Perimeter, Area & Volume

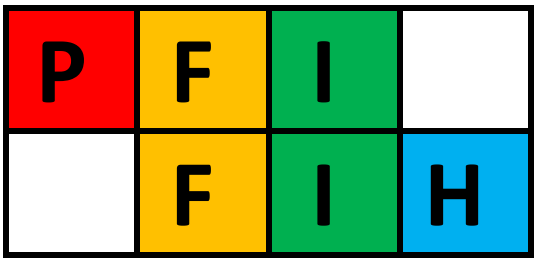
Prepare		
Find the perimeter of shapes by counting squares	3	G
Calculate the perimeter of a rectangle	4	F
Find the area of shapes by counting squares	3	G
Find the volume of shapes by counting cubes	4	G
Foundation – grade 2		
Calculate the perimeter of composite shapes with missing sides	5	E
Know and use the formula for finding the area of a rectangle	4	F
Find the area of composite shapes made up from rectangles	6	E
Know and apply the formula to calculate area of triangle, parallelograms and trapezia	6	D
Foundation – grade 3		
Calculate the surface area of a cuboid	6	E
Know and use the formula for the circumference of a circle (πd or $2\pi r$)	6	D
Calculate the perimeter of 2d composite shapes including semi circles and parts of circles	7	C
Know and use the formula for the area of a circle (πr^2)	6	D
Calculate area of composite shapes	6	D
Know and apply the formula to calculate volume of cuboids and prisms including cylinders	6-7	D-C
Intermediate – grade 4		
Calculate arc lengths and angles of sectors of circles	9	A
Calculate the surface area of spheres, pyramids, cones and composite shapes including frustums	9	A
Calculate area of sectors of circles	9	A
Calculate the volume of spheres, pyramids, cones and composite shapes including frustums	8-9	A-A*
Higher – grade 7		
Area of a circle using Sine	9	A
Apply the concepts of congruence and similarity including the relationships between lengths in similar figures	9	A
Apply the concepts of congruence and similarity including the relationships between area in similar figures	9	A
Apply the concepts of congruence and similarity including the relationships between volume in similar figures	9	A

Geometry 2 – Properties of Shapes

Areas covered:

Properties of Shapes

Pythagoras & Trigonometry



Properties of Shape

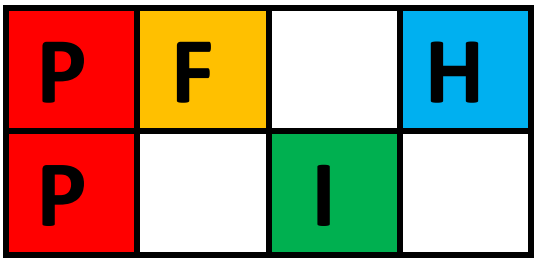
Prepare		
Use everyday language to describe properties of 2d and 3d shapes	1	
Use mathematical names for common 2d and 3d shapes	2	
Describe properties of shapes, including number of sides and corners	2	
Identify lines of symmetry	2	
Identify rotational symmetry	2	
Foundation – grade 1		
Recognise and name common triangles – isosceles, equilateral, scalene, right angled	3	G
Recognise and name common quadrilaterals – square, rectangle, parallelogram, trapezium, kite, rhombus	3	G
Recognise and name common polygons – pentagon, hexagon, octagon, decagon	4	F
Classify 2-d and 3d shapes in various ways using mathematical properties such as reflective and rotational symmetry	3	G
Understand tessellation and identify which shapes tessellate	5	D
Use the word congruent to describe identical shapes	4	G
Foundation – grade 2		
Use standard conventions for labelling and referring to the sides and angles of triangles and quadrilaterals	6	E
Derive and apply the properties and definitions of triangles – isosceles, equilateral, scalene, right angled, acute angled, obtuse angled	5	E
Derive and apply the properties and definitions of quadrilaterals – square, rectangle, parallelogram, trapezium, kite, rhombus	6	C
Derive and apply the properties and definitions of polygons – pentagon, hexagon, octagon, decagon	6	D
Recognise and name prisms – cube, cuboid, triangular prism, cylinder		
Recognise and name - pyramids – tetrahedron, square based pyramid, cone	3	G
Identify properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones, spheres	4	E
Begin to recognise the nets of common prisms – cube, cuboid, triangular prism,	4	F
Begin to recognise the nets of common pyramids – tetrahedron, square based pyramid,	4	F
Draw triangles from written descriptions	6	E
Interpret and construct plans and elevations of 3d shapes	6	D
Identify and apply circle definitions and properties	4	G
Intermediate – grade 4		
Know, use and apply the formula for Pythagoras theorem $a^2 = b^2 + c^2$	7	C
Apply Pythagoras theorem and trigonometric ratios to find angles and lengths in right angled triangles in 2 dimensional figures	7 – 8	C - B
Intermediate – grade 5		
Know, use and apply the trigonometric ratios	8	B
Know the exact values of sin θ and cos θ for θ = 0°, θ = 30°, θ = 45°, θ = 60°, θ = 90°		
Know the exact values of tan θ for θ = 0°, θ = 30°, θ = 45°, θ = 60°,		
Higher – grade 7		
Know and apply the sine rule	9	A
Know and apply the cosine rule	9	A
Know and apply formula for area of a triangle to calculate the area, sides or angles of any triangle	10	A*
Higher – grade 8		
Apply Pythagoras theorem and trigonometric ratios to find angles and length in right angled triangles in 3 dimensional figures	8	A
Apply Pythagoras theorem and trigonometric ratios to find angles and length in general triangles in 2 and 3 dimensional figures	10	A*

Geometry 3 – Angles & Construction

Areas covered:

Angles

Construction



Angles & Construction

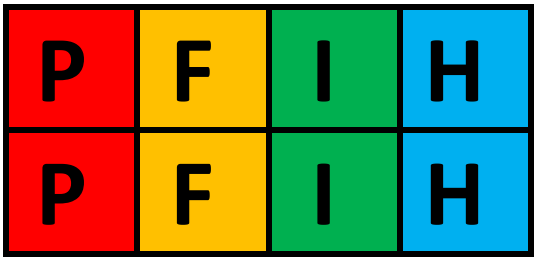
Prepare		
Recognise acute, obtuse and reflex angles	3	F
Draw and measure a line to the nearest mm	2	G
Estimate angles	4	F
Measure and draw angles to the nearest degree	4	F
Foundation – grade 2		
Draw a triangle accurately given 3 sides	6	D
Draw a triangle accurately given 2 sides 1 angle	4	F
Draw a triangle accurately given 1 side 2 angles	2	G
Draw a quadrilateral such as a kite or parallelogram accurately given measurements	6	D
Foundation – grade 3		
Apply the properties of angles at a point	5	F
Apply the properties of angles on a straight line	5	E
Apply the properties of vertically opposite angles	5	E
Apply the properties of angles in a triangle	5	E
Understand and use alternate and corresponding angles on parallel lines **Z and F angles no longer accepted**	6	D
Find the interior and exterior angles of regular polygons	6	C
Derive and use the sum of angles in a triangle to deduce and use the angle sum in any polygon and to derive properties of regular polygons,	6	C
Intermediate – grade 4		
Use the standard ruler and compass constructions for perpendicular bisector of a line segment	6	C
Use the standard ruler and compass constructions for constructing a perpendicular to a given line from/at a given point	6	C
Use the standard ruler and compass constructions for bisect a given angle	6	C
Use the standard ruler and compass constructions for an angle of 60°	6	C
Use constructions to create given figures and solve loci problems	7	C
Know that the perpendicular distance from a point to a line is the shortest distance to the line.	7	C
Intermediate – grade 5		
Use the basic congruence criteria for triangles SSS, SAS ASA RHS	7	C
Higher – grade 6		
Apply and prove the standard circle theorems concerning angles, radii tangents and chords.	9	A
Use them to prove related results	10	A*

Geometry 4 – Transformation & Vectors

Areas covered:

Transformation

Vectors



Transformation & Vectors

Prepare		
Plot coordinates in first quadrant	3	G
Plot coordinates in 4 quadrants	4	F
Describe turn as ¼ and ½ turns using clockwise and anticlockwise	3	G
Reflect shapes in a given horizontal and vertical mirror line	4	F
Reflect shapes in a given diagonal mirror line	5	E
Enlarge shapes by a given scale factor	6	D
Give a scale factor for a simple enlargement	4	F
Describe movements as left right up and down	3	F
Foundation – grade 2		
Identify, describe and construct, on coordinate axes, using rotation	5	D
Identify, describe and construct, on coordinate axes, using reflection	6	D
Identify, describe and construct, on coordinate axes, using translation	6	D
Understand and use the words congruence and similar to describe images	6	D
Describe translations as 2d vectors	6	D
Foundation – grade 3		
Solve geometrical problems on coordinate axes		
Intermediate – grade 4		
Identify, describe and construct, on coordinate axes, using enlargement with positive integer scale factor	6	D
Identify, describe and construct and construct shapes on coordinates axes using enlargement using fractional scale factors	7	C
Intermediate – grade 5		
Apply addition and subtraction of vectors, multiplication of vectors by a scalar and diagrammatic and column representation of vectors	9	A
Higher – grade 6		
Identify, describe and construct and construct shapes on coordinates axes using enlargement using negative scale factors	9	A
Describe the changes and invariance achieved by a combination of rotations, reflections and translations.	8	B
Higher – grade 8 9		
Use vectors to construct geometric arguments and proofs	10	A*

Probability

There is 1 Probability unit

Unit 1 Probability

- **Probability**

Probability 1 – Probability

Areas covered:

Probability

Probability

Prepare		
Understand and use vocabulary of probability	3	G
Understand and use the probability scale from 0 to 1	5	F
Foundation – grade 1		
Relate relative expected frequencies to theoretical probability, using appropriate language and the 0 to 1 probability scale	5	F
Foundation – grade 2		
Express a probability as a fraction	5	F
Display outcomes systematically	5	F
Understand the difference between theoretical and experimental probability	5	E
Understand mutually exclusive events	6	D
Record, describe and analyse the frequency of outcomes of probability experiments using tables and trees. These should be written as fractions, decimals or percentages.	6	D - E
Apply the property that the probabilities of an exhaustive set of outcomes sum to 1	5	F
Apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to 1	5	F
Foundation – grade 3		
Understand and use relative frequency	5	E
Enumerate sets and combinations of sets systematically, using tables, grids and Venn diagrams	6	D
Construct theoretical probability spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities	6	D
Intermediate – grade 4		
Understand the empirical unbiased samples tend towards theoretical probability distributions with increasing sample size.	7	C
Enumerate sets and combinations of sets systematically, using probability trees	8	A
Intermediate – grade 5		
Calculate the probability of independent and dependent combined events using tee diagrams and other representations and knowing the underlying assumptions	8	A
Higher – grade 6		
Calculate and interpret conditional probabilities through representation using expected frequencies with two way tables, tree diagrams and Venn Diagrams	8	A
Higher – grade 7		
understand and apply And Or probability	8	A

Statistics

There is 1 Statistics unit

Unit 1 Handing Data

- Specify, Plan and Collect Data
- Processing Data
- Representing Data
- Interpreting and Discussing Data

Statistics 1 – Handling Data

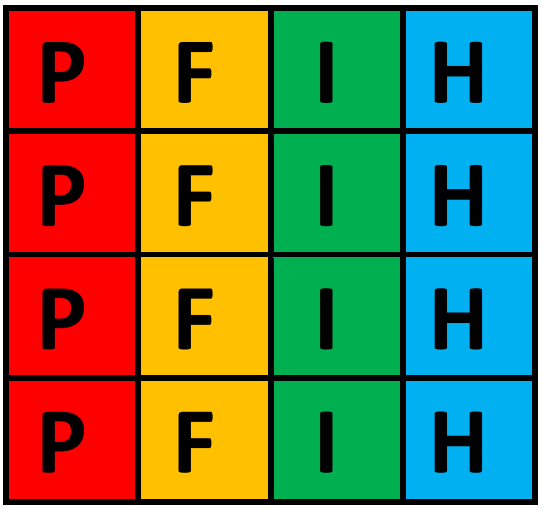
Areas covered:

Specify, Plan and Collect Data

Processing Data

Representing Data

Interpreting Data



Statistics

Prepare		
Sort and classify object and data	2	
Collect and sort data to test simple hypothesis	2	
Design a survey or experiment to capture the necessary data from one or more sources.	6	D
Represent their data in pictures	1	
Record results in simple lists, tables, pictograms and block graphs	2	
Foundation – grade 1		
Design and use tally charts for discrete and grouped data	4	G
Interpret analyse and compare the distributions of data sets through Bar charts	4	G
Interpret analyse and compare the distributions of data sets through Pictograms	4	F
Foundation – grade 2		
Design and use two way tables	**6**	**E**
Interpret analyse and compare the distributions of data sets through appropriate measures of central tendency (median, mean mode and modal class)	**4**	**F**
Interpret analyse and compare the distributions of data sets through appropriate measures of spread (range, including consideration of outliers)	**4**	**F**
Interpret analyse and compare the distributions of data sets through frequency tables	**4**	**G**
Interpret analyse and compare the distributions of data sets through vertical line charts (for ungrouped discrete numerical data)	**5**	**E**
Foundation – grade 3		
Calculate the mean for a frequency distribution	**6**	**D**
Estimate the mean from a grouped frequency table and find the class interval that contains the median	**7**	**C**
Use Σ symbol to represent the sum of	**6**	**D**
Interpret analyse and compare the distributions of data sets through Pie charts	**6**	**E**
Use and interpret scatter graphs of bivariate data	**6**	**D**
Recognise correlation and know it does not indicate causation	**6**	**D**
Draw estimated lines of best fit & make predictions	**7**	**C**
Interpolate and extrapolate apparent trends whilst knowing the dangers of doing so	**7**	**C**
Intermediate – grade 4		
Know sampling methods – systematic, quota, cluster and convenience	7	C
Construct and interpret tables and charts from time series data.	8	B
Construct a time series graph, calculate and plot moving averages		
Use a trend line to estimate other values		
Intermediate – grade 5		
Use stratified sampling methods	9	A
Higher – grade 6		
Estimate and find the median quartiles and IQR for large data sets including a cumulative frequency diagram	8	B
Interpret analyse and compare the distributions of data sets through box plots, quartiles and IQR	8	B
Higher – grade 7		
Construct diagrams and interpret for grouped discrete data and continuous data including Histograms with equal and unequal class intervals	9	A