

Autumn Term

UNIT 1a: Number problems and Reasoning, Place Value and Estimating

Prior Learning

Topic	Hegarty Clip Number
List possible outcomes from two events.	670
Round numbers to the nearest 10, 100 and 1000.	17
Round numbers to decimal places.	56
Apply the four operations.	1/2/4/5
Understand place value	13

Learning Objectives

Topic	Hegarty Clip Number
Related Calculations	135
Estimation	131
Estimating a square root	112
Worded estimation	131
Product rule for counting	671
Interpreting product rule for counting	671
Harder questions involving the product rule for counting	673

UNIT 1B: Highest Common Factor and Lowest Common Multiple

Prior Learning

Topic	Hegarty Clip Number
Identify prime numbers	28
List the factors of a number.	27
List multiples of a number	33

Learning objectives

Topic	Hegarty Clip Number
Writing a number as a product of its prime factors	30
Find the LCM of 2 numbers	35
Find the HCF of 2 numbers	32
Find the HCF of 3 numbers	32
Worded LCM problems	36
Harder worded LCM problems	36

UNIT 1C: Index Laws

Prior Learning

Topic	Hegarty Clip Number
Work out simple powers and roots	101
Calculate using powers and roots	120
Convert between basic fractions and decimals	73
Calculate with negative numbers	39/40

Learning objectives

Topic	Hegarty Clip Number
Multiplying with index laws	105
Dividing with index laws	106
Simplify numerical expressions using index laws	106
Understanding the power of 0	103
Calculating with negative indices	104
Calculating with fractional indices	108
Calculating with negative and fractional indices	109
Solving equations with indices	105/107
Forming expressions from indices	793

UNIT 1d: Standard Form

Prior Learning

Topic	Hegarty Clip Number
Multiply by powers of 10	15
Divide by powers of 10	16
Compare decimals	46

Learning objectives

Topic	Hegarty Clip Number
Write ordinary number in standard form	122
Write standard form as an ordinary number	123
Order numbers in standard form	123
Multiply numbers in standard form	125
Divide numbers in standard form	126
Add numbers in standard form	127
Worded standard form problems	128

UNIT 1e: Surds

Prior Learning

Topic	Hegarty Clip Number
Be able to square root a number	101
Simplify an algebraic expression by collecting like terms	156
Expand single brackets	160
Expand double brackets	162

Learning objectives

Topic	Hegarty Clip Number
Simplify a surd	115
Rationalise a denominator	118
Expand a single bracket involving surds	116
Expand a double bracket involving surds	117
Calculating with surds (applied)	114

UNIT 2a: Inequalities

Prior Learning

Topic	Hegarty Clip Number
Understand inequality signs	-
Solve a basic linear equation	178/179/184
Collect like terms	156
Expand a bracket	160

Learning objectives

Topic	Hegarty Clip Number
Identify integer values that satisfy an inequality	267
Solve linear inequality	269
Write inequality from a number line	266
Show an inequality on a number line	265
Solve double sided inequality	269

UNIT 2b: Formula

Prior Learning

Topic	Hegarty Clip Number
Write a formula from worded information	155
Substitute into an expression	780
Solve an equation	178
Understand inverse operations	179

Learning objectives

Topic	Hegarty Clip Number
Substitution	781
Substitution involving indices	783
Substitution with negatives	784
Substitution problems	784
Changing the subject (basic)	281
Changing the subject (multi-step)	281
Changing the subject (subject appears twice)	281

UNIT 2c: Sequences

Prior Learning

Topic	Hegarty Clip Number
Find the next term of a given arithmetic sequence.	197
Substitute values in a simple linear expression.	781
Solve an equation	178
Find the next term of given sequences.	197
Find the term-to-term rule for a sequence.	197

Learning objectives

Topic	Hegarty Clip Number
Generate a sequence	198
Nth term	198
Determine if a number is in a sequence	198
Interpret statements relating to sequences	197
Nth term of a quadratic sequence	248
Solve problems from sequences	198
Fibonacci	263

Spring Term

UNIT 3a: Averages and Range

Prior Learning

Topic	Hegarty Clip Number
Work out mode, median and range from a list of numbers.	404/405/409/410
Find the midpoint of two numbers.	200

Learning objectives

Topic	Hegarty Clip Number
Calculate the mean given combined data	408
Mode from a frequency table	415
Mean from a frequency table	417
Interval that contains the median	416
Mean from a group frequency table	418

UNIT 3b: Statistical Diagrams

Prior Learning

Topic	Hegarty Clip Number
Interpret basic pie charts	427
Use subtraction to find missing values.	19
Draw a bar chart.	425
Draw and use a pictogram	426
Draw and interpret a line graph	425

Learning objectives

Topic	Hegarty Clip Number
Complete a stem and leaf diagram	431
Interpret a stem and leaf diagram	430
Compare data from a stem and leaf diagram	432
Frequency polygons	441
Pie Charts	427
Complete a two-way table	423
Draw a two-way table	424

UNIT 3c: Time Series and Histograms

Prior Learning

Topic	Hegarty Clip Number
Plot a line graph	425
Find the area of a rectangle	554
Reading values from a graph	425

Learning objectives

Topic	Hegarty Clip Number
Time series graphs	450
Draw a histogram	446
Read frequencies from a histogram	442
Interpret a histogram	443
Complete a part-filled histogram and table	444
Calculate a value from a histogram (no axis labels)	445

UNIT 3d: Scatter Graphs

Prior Learning

Topic	Hegarty Clip Number
Plot points on a coordinate grid	199
Read values from graphs.	425

Learning objectives

Topic	Hegarty Clip Number
Identify/interpret outliers	454
Draw a line of best fit	454
Identify correlation	454
Estimate a result	454
Interpreting statements about future results	454

UNIT 4a: Percentages

Prior Learning

Topic	Hegarty Clip Number
Calculate percentages of amounts (non-calc)	84
Calculate percentages of amounts (calc)	87
Work out percentage multipliers.	89
Increase and decrease using a percentage	90
Convert between fractions, decimals and percentages.	149
Simplify fractions	61
Add, subtract, multiply, and divide fractions	66/69/70

Learning objectives

Topic	Hegarty Clip Number
Percentage change	97
Reverse percentages	96
Simple interest	93
Compound Interest	94
Original price after increase/decrease	96
Repeated percentage change	92
Compound interest problem solving	94

UNIT 4b: Ratio

Prior Learning

Topic	Hegarty Clip Number
Simplify ratios.	329
Write a ratio from given information	330
Multiplying numbers including decimals (non calc)	48
Fraction of an amount	77
Dividing (non calc)	22

Learning objectives

Topic	Hegarty Clip Number
Convert between ratio and fraction	330
Calculate values given one part of a ratio	333
Writing a ratio	329
Sharing into a given ratio	332
Combining ratio	-
Calculating values given a difference in ratio	334
Worded ratio change questions	332
Problem solving with ratio and fractions	335

UNIT 4c: Proportion

Prior Learning

Topic	Hegarty Clip Number
Solve simple recipe problems	739
Convert between metric units	692

Learning objectives

Topic	Hegarty Clip Number
Unit conversion	705
Direct proportion (basic)	339
Worded conversion problems	339
Value for money (best buys)	763
Inverse proportion and assumptions	342
Currency conversion	707
Conversion problems with unit and currency	708

UNIT 5a: Polygons

Prior Learning

Topic	Hegarty Clip Number
Identify types of triangle and quadrilateral.	823/824
Derive and use the sum of angles in a triangle and in a quadrilateral.	485
Derive and use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles.	485
Be able to calculate missing angles on a straight line	477
Be able to calculate missing angles around a point	812
Substitute numbers into an expression with brackets.	782

Learning objectives

Topic	Hegarty Clip Number
Identifying polygons	822
Calculating the sum of interior angles	561
Calculating angles from a compound diagram	562
Calculating angles from split polygon	562
Calculating angles in more complex diagrams	562
Identifying exterior angle given interior	563
Calculate number of sides	564
Calculate number of sides in a complex diagram	564
Solve harder polygon problems	564

UNIT 5b: Pythagoras and Trigonometry

Prior Learning

Topic	Hegarty Clip Number
Recall square numbers and square roots.	99
Find square roots using a calculator	101
Convert fractions to decimals.	73/74
Use the angle sum of a triangle to work out missing angles.	485

Learning objectives

Topic	Hegarty Clip Number
Pythagoras' Theorem	498
Applied Pythagoras problems	502
Pythagoras and right-angled triangles	498
Exact values	845
Trigonometry (missing side)	509
Trigonometry (missing angle)	511
Applied trigonometry	515
Multi-step trigonometry/Pythagoras	313

Summer Term

UNIT 6a: Straight Line Graphs

Prior Learning

Topic	Hegarty Clip Number
Plot a co-ordinate	199
Rearrange equations.	281
Substitute into a formula	784
Understand Pythagoras' Theorem	498
Simplify fractions	61

Learning objectives

Topic	Hegarty Clip Number
Plot a straight-line graph	206
Write the equation of a line using a graph	208
Match equations with their graphs	208
Calculate the midpoint of 2 points	200
Calculate the gradient between 2 points	201
Calculate the end point from start and midpoint	200
Equation of a straight line from 2 coordinates	213
Rearrange and compare equations of 2 lines	210
Write down a parallel gradient	214
Write down a perpendicular gradient	215
Write down the equation of a perpendicular line	216

UNIT 6b: Real-Life Graphs

Prior Learning

Topic	Hegarty Clip Number
Find the area of triangles and rectangles.	554/557
Write the equation of a line from a graph.	208

Learning objectives

Topic	Hegarty Clip Number
Read a distance-time graph	874
Complete a distance-time graph	875
Interpret the gradient of a distance-time graph	876
Calculate greatest speed	876
Interpret gradient of a real-life graph	896
Calculate gradient of a real-life graph	896
Interpret a real life graph	894

UNIT 6c: Straight Line Graphs

Prior Learning

Topic	Hegarty Clip Number
Substitute into a formula involving powers	785
Plot a co-ordinate	199
Square and square roots numbers	99

Learning objectives

Topic	Hegarty Clip Number
Identify the shape of graphs	299/301
Plot quadratic graphs	251
Plot cubic graphs	298
Plot reciprocal graphs	300
Plot exponential graphs	302
Plots graphs of circles	314

UNIT 7a: Perimeter, Area and Circles

Prior Learning

Topic	Hegarty Clip Number
Calculate the area of a rectangle, triangle and parallelogram	554/556/557
Fraction of an amount	77
Identify parts of a circle	592

Learning objectives

Topic	Hegarty Clip Number
Perimeter of compound shapes	551
Area using compound shapes	555
Area of a circle	539
Circumference of a circle	534
Worded area problems with compound shapes	558
Compound shapes involving circles	543
Compound shapes involving trapeziums	559
Area of a sector	546
Arc Length	544

UNIT 7b: Surface Area and Volume

Prior Learning

Topic	Hegarty Clip Number
Calculate the volume and surface area of a cuboid.	584/568
Sketch a net of a cylinder.	833
Identify names of 3D shapes	829

Learning objectives

Topic	Hegarty Clip Number
Surface area of a prism	585
Volume of a prism	571
Worded surface area problems	589
Volume and capacity	572/698
Volume of a hemisphere	580
Volume of compound solid (cone and hemisphere)	582
Surface area and volume (challenge)	586/591

UNIT 7c: Metric Conversions, Accuracy and Bounds

Prior Learning

Topic	Hegarty Clip Number
Convert metric measures.	692
Recall the formulae for the area of quadrilaterals and triangles.	554/557
Round numbers to a specified degree of accuracy (dp and sf).	56
List the possible values of x from an inequality	267
Substitute into a formula	781

Learning objectives

Topic	Hegarty Clip Number
Convert between units of volume	702
Identify upper and lower bounds	138
Write down an error interval for a rounded value	774
Calculate a maximum value	139
Calculate an upper bound (division)	139
Calculate values to a suitable degree of accuracy	139
Give an error interval for a truncated value	774

UNIT 8a: Transformations

Prior Learning

Topic	Hegarty Clip Number
Describe and carry out translations.	638
Describe and carry out reflections.	639
Describe and carry out rotations.	648
Describe and carry out enlargements with a positive scale factor.	642

Learning objectives

Topic	Hegarty Clip Number
Enlarge shape by fractional scale factor	645
Enlarge shape by a negative scale factor	646
Describe the reserve of an enlargement	651
Enlarge by a negative and fractional scale factor	646
Fully describe an enlargement	651
Carry out a combination of transformations	657

UNIT 8b: Plans and Elevations

Prior Learning

Topic	Hegarty Clip Number
Draw 3D shapes on an isometric grid.	832
Recognise dimensions of a 3D shapes	830

Learning objectives

Topic	Hegarty Clip Number
Draw plans of shapes made from cubes	839
Draw accurate plans and elevations	840
Draw elevation given another elevation and plan	843
Sketch a solid given plans and elevations	842

UNIT 8c: Bearings and Scale Drawings

Prior Learning

Topic	Hegarty Clip Number
Use ratio to convert between scales	866
Calculate angles around a point	812
Calculate angles on parallel lines	481/482/483
Pythagoras	498
Trigonometry	509/511

Learning objectives

Topic	Hegarty Clip Number
Use a scale to accurately calculate real length	865
Measure a bearing	492
Calculate the real distance using a scale	865
Accurately mark the position of an object	493
Mark the position of an object given 2 bearings	869
Calculate the reverse bearing	494
Pythagoras and bearings	502
Trigonometry and bearings	511

UNIT 8d: Constructions and Loci

Prior Learning

Topic	Hegarty Clip Number
Draw angles with a protractor.	461
Construct triangles using a ruler and compasses	683
Construct the perpendicular bisector of a line.	660
Bisect an angle using a ruler and compasses.	661
Construct angles using a ruler and compasses.	665
Draw a locus of points.	674

Learning objectives

Topic	Hegarty Clip Number
Construct and equilateral triangle	666
Draw a simple locus of points	675
Problem solving with loci	675
Further problem solving with loci	676