

# FOUNDATION MATHS CURRICULUM



A levels: Maths / Further Maths  
University: Russell group & Oxbridge  
Business, Accountancy & Finance  
Engineering, Aviation, Applied Science  
Computer game coding

PIXL Spring Wave Exams

PIXL Autumn Wave Exams

Zone 11 starts

**BESPOKE REVISION**  
Topics linked to identified needs of individual classes

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**YEAR 11**

**TRIGONOMETRY**  
Label the sides of the triangle appropriately in connection with the angle.  
Use trigonometry to calculate missing sides of a triangle & missing angles of a triangle

**PLANS, ELEVATIONS AND CONSTRUCTIONS**  
Use a compass to draw bisectors and loci.  
Use isometric paper to draw 3d shapes.  
Draw 2d representations of 3d shapes using different aspects of view.

**PYTHAGORUS**  
Use Pythagoras' theorem to calculate the hypotenuse of a triangle, the shorter side of a triangle & to solve problems that require multiple steps.

**RATIO & PROPORTION**  
Identify direct and inverse proportion and use the appropriate method to calculate an amount.  
Understand ratios and convert them to fractions.  
Use appropriate strategies to calculate missing amounts shared in a ratio.

**PROBABILITY**  
Calculate relative frequency.  
Write a probability from a 2-way table, venn diagram & real-life situations.  
Calculate missing probabilities.  
Set up and use tree diagrams for independent & dependent events.

**TRANSFORMATIONS**  
Know there are 4 transformations.  
Follow instructions to draw transformations of shapes.  
Describe a transformation from two shapes.  
Understand vectors

**PERIMETER, AREA AND VOLUME**  
Calculate the area of 2D & compound shapes.  
Calculate the surface area & volume of prisms.  
Use volume and surface area to calculate unknown lengths

**REAL LIFE AND STRAIGHT-LINE GRAPHS**  
Plot liner graphs from an equation.  
Use  $y=mx+c$  to write an equation from a straight-line graph.  
Understand gradient and gradients of parallel lines.  
Plot and interpret graphs of real-life situations.

**FDP AND PERCENTAGES**  
Convert between fractions, decimals and percentages fluently  
Percentages of an amount, increase and decrease

**STATISTICS, SAMPLING AND AVERAGES**  
Calculate with mean, median and mode, inc. from data in a table.  
Compare two or more sets of data using averages and range.  
Construct and interpret stem and leaf diagrams.

**YEAR 10**

Zone 10 starts

**FDP AND PERCENTAGES**  
Convert between fractions, decimals and percentages fluently  
Writing a percentage  
Percentages of an amount  
Percentage increase and decrease

**STATISTICS, SAMPLING AND AVERAGES**  
Calculate with mean, median and mode, including from data in a table.  
Compare two or more sets of data using averages and range.  
Construct and interpret stem and leaf diagrams.

**SEQUENCES**  
Continue a numerical or diagram pattern  
Describe in words and using algebra (nth term) the sequence  
Use the nth term to locate a value in a sequence

**FRACTIONS**  
Use four operations with fractions  
Convert between mixed and improper fractions.  
Calculate with mixed and improper fractions.  
Problem solve with fractions.

**EQUATIONS AND INEQUALITIES**  
Write an equation  
Use a function machine  
Solve equations  $2x + 3 = 9$  and  $4x - 3 = 2x + 9$  and inequalities  $2x + 3 > 9$   
Show an inequality on a number line.

**TABLES, CHARTS AND GRAPHS**  
Make a tally chart  
Draw and interpret bar charts, pictograms, histograms and line graphs

**PIE CHARTS AND SCATTER GRAPHS**  
Accurately draw pie charts  
Interpret pie charts  
Draw a scatter graph including a line of best fit  
Be able to describe and explain correlation from a scatter graph

**ALGEBRA BASICS, BRACKETS AND FORMULAE**  
Simplifying, expanding, factorising including quadratics  
Laws of Indices - including negative & fractional

**PROPERTIES OF SHAPES, PARALLEL LINES, ANGLE FACTS, INTERIOR AND EXTERIOR ANGLES OF POLYGONS**  
Draw and measure angles  
Rules for angles on a straight line, around a point, in a right angle and vertically opposite angles  
Rules related to isosceles and equilateral triangles  
Parallel lines and angle rules  
Name shapes (polygons)  
Interior and exterior angles of polygons.

**INTEGERS & DECIMALS**  
Add, Subtract, Multiply and Divide  
Rounding and Estimation

**INDICES, ROOTS, MULTIPLES, FACTORS & PRIMES**  
Finding the square and square root of values  
Listing multiples and factors, prime numbers  
Writing a number in prime factor form

**YEAR 9**

**INDICES**  
Add and subtract expressions with indices  
Multiply and divide with indices  
Addition and subtraction laws for indices

**FRACTIONS AND PERCENTAGES**  
Convert between fractions, decimals and percentages  
Calculate fraction, decimals and percentages of an amount with and without a calculator  
Calculate percentage increase and decrease  
Percentage change

**STANDARD INDEX FORM**  
Investigate positive and negative powers of 10  
Order numbers in standard form  
Use the four operations with numbers in standard form

**TABLES AND PROBABILITY**  
Create sample space diagrams  
Find probabilities from different diagrams

**BRACKETS, EQUATIONS AND INEQUALITIES**  
Form algebraic expressions  
Directed number and algebra  
Multiply out and factorise brackets  
Expand multiple single brackets  
Solve equations with brackets  
Form and solve equations  
Solve simple inequalities

**SEQUENCES**  
Generate a rule from words  
Generate a rule from algebra

**WORKING IN THE CARTESIAN PLANE**  
Co-ordinate in 4 quadrants  
Graphs that are parallel to an axis  $y = mx + c$   
Gradients of graphs

**REPRESENTING DATA**  
Scatter graphs  
Correlation  
Lines of best fit  
Frequency tables  
Two-way tables

**RATIO AND SCALE**  
Use ratio notation  
Ratios in the form 1:n  
Divide into a given ratio  
Simplify ratios

**MULTIPLICATIVE CHANGE**  
Direct proportion problems  
Conversion graphs  
Currency conversion  
Similar shapes and scale factors  
Scale diagrams  
Maps

**MULTIPLYING AND DIVIDING FRACTIONS**  
Multiply integers and fractions  
Multiply two fractions  
Divide integers and fractions  
Divide two fractions

**SETS AND PROBABILITY**  
Identify sets  
Venn diagrams  
Sample space diagrams  
Probability scale

**PRIME NUMBERS AND PROOF**  
Find and use multiples  
Recognise prime numbers  
Recognise square and triangular numbers  
Common factors and HCF  
Common multiples and LCM  
Product of prime factors

**CONSTRUCTING, MEASURING AND USING GEOMETRIC NOTATION**  
Draw and measure line segments and angles  
Understand angles are a measure of a turn  
Identify polygons and different types of line  
Construct triangles  
Draw and interpret pie charts

**DEVELOPING GEOMETRIC REASONING**  
Use and apply angle rules  
Properties of triangles and quadrilaterals

**DEVELOPING NUMBER SENSE**  
Mental arithmetic strategies  
Factors  
Estimating calculations

**YEAR 8**

**DEVELOPING GEOMETRIC REASONING**  
Understand and apply angles rules

**DEVELOPING NUMBER SENSE**  
Derive calculations from known facts  
Estimate answers to calculations  
Apply mental methods to calculations

**SETS AND PROBABILITY**  
Understand and use the probability scale  
Calculate the probability of a single event  
Generate sample spaces and venn diagrams  
Understand what is meant by set, union and intersection

**ADDITION AND SUBTRACTION OF FRACTIONS**  
Convert between mixed and improper fractions  
Add and subtract fraction with the same denominator  
Add and subtract fractions with different denominators

**CONSTRUCTING, MEASURING AND USING GEOMETRIC NOTATION**  
Draw and measure line segments and angles  
Understand angles are a measure of a turn  
Identify polygons and different types of line  
Construct triangles  
Draw and interpret pie charts

**FDP OF AN AMOUNT**  
Calculate a fraction of an amount  
Calculate a percentage of an amount mentally and using a calculator

**OPERATIONS & EQUATIONS WITH DIRECTED NUMBER**  
Understand directed numbers in different contexts  
Perform calculations that cross zero  
Add, subtract, multiply and divide directed numbers  
Solve two step equations  
Use order of operations with directed numbers

**FDP EQUIVALENCE**  
Represent tenths and hundredths on diagrams  
Convert fluently between fractions, decimals and percentages  
Use and interpret pie charts  
Identify equivalent fractions

**SOLVING PROBLEMS WITH ADDITION & SUBTRACTION**  
Formal methods of adding and subtracting integers and decimals.  
Mental methods for adding and subtracting integers  
Solve financial maths problems  
Solve problems which include perimeter and frequency trees

**SOLVING PROBLEMS WITH MULTIPLICATION & DIVISION**  
Understand and use factors and multiples  
Understand order of operations  
Apply formal written methods to multiplication and division of integers and decimals  
Solve problems involving area and the mean

**EQUALITY & EQUIVALENCE**  
Understand like terms  
Solve simple equations  
Understand the meaning of equivalence  
Simplify expressions

**PLACE VALUE**  
Work out intervals on a number line  
Use place value to write large numbers  
Use inequalities to compare numbers  
Round numbers to significant figures  
Calculate the range and median of sets of numbers

**PENTOMINOES**  
Problem solving

**ALGEBRAIC NOTATION**  
Understand function machines  
Use letters with function machines  
Substitute values into expressions  
Generate sequences given an algebraic rule

**YEAR 7**