



Year 10 FOUNDATION Maths Medium Term Plan

Autumn Term

Learning Overview	Integers and place value • understand and use integers (positive, negative and zero) • understand place value • use directed numbers in practical situations e.g. temperatures • order integers • use the four rules of addition, subtraction, multiplication and division • use brackets and the hierarchy of operations • use the terms 'odd', 'even', 'prime numbers', 'factors' and 'multiples' • identify prime factors, common factors and common multiples Decimals • use decimal notation • understand place value • order decimals • convert a decimal to a fraction or a percentage (Terminating decimals only) • recognise that a terminating decimal is a fraction Special numbers and powers • identify square numbers and cube numbers • calculate squares, square roots, cubes and cube roots • use index notation and index laws for multiplication and division of positive and negative integer powers including zero Fractions • understand and use equivalent fractions, simplifying a fraction by cancelling common factors in its simplest form (lowest terms) • understand and use mixed numbers and vulgar fractions • identify common denominators • order fractions and calculate a given fraction of a given quantity • express a given number as a fraction of another number Percentages • understand that 'percentage' means 'number of parts per 100' • express a given number as a percentage of another number
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- express a percentage as a fraction and as a decimal

Ratio and proportion

- use ratio notation, including reduction to its simplest form and its various links to fraction notation Express in the form $1 : n$
- divide a quantity in a given ratio or ratios Share £416 in the ratio $5 : 3$ or $4 : 3 : 1$
- use the process of proportionality to evaluate unknown quantities
- calculate an unknown quantity from quantities that vary in direct proportion Find the missing value in a table s varies directly as t
- solve word problems about ratio and proportion

Arithmetic of fractions

- use common denominators to add and subtract fractions and mixed numbers
- convert a fraction to a decimal or a percentage
- understand and use unit fractions as multiplicative inverses
- multiply and divide fractions and mixed numbers

Set language and Venn diagrams

- understand the definition of a set
- use the set notation $\cup$, $\cap$ and $\in$ and $\notin$
- understand the concept of the universal set and the empty set and the symbols for these sets (E = universal set $\emptyset$ = empty set)
- understand and use the complement of a set (Use the notation A')
- use Venn diagrams to represent sets

Algebraic manipulation

- understand that symbols may be used to represent numbers in equations or variables in expressions and formulae
- understand that algebraic expressions follow the generalised rules of arithmetic
- use index notation for positive and negative integer powers (including zero)
- use index laws in simple case
- evaluate expressions by substituting numerical values for letters
- collect like terms
- multiply a single term over a bracket $3x(2x + 5)$
- take out common factors (Factorise fully $8xy + 12y^2$)
- expand the product of two simple linear expressions (Expand and simplify)

	- understand the concept of a quadratic expression and be able to factorise such expressions (limited to $x^2 + bx + c$) Factorise $x^2 + 10x + 24$ Equations and inequalities - solve linear equations, with integer or fractional coefficients, in one unknown in which the unknown appears on either side or both sides of the equation - set up simple linear equations from given data - understand and use the symbols $>$, $<$, $\geq$ and $\leq$ To include double-ended inequalities e.g. $1 < x \leq 5$ - understand and use the convention for open and closed intervals on a number line Real life graphs - interpret information presented in a range of linear and non-linear graphs. To include speed/time and distance/time graphs - draw and interpret straight line conversion graphs. To include currency conversion graphs Straight line graphs - understand and use conventions for rectangular Cartesian coordinates - plot points (x, y) in any of the four quadrants or locate points with given coordinates - determine the coordinates of points identified by geometrical information - determine the coordinates of the midpoint of a line segment, given the coordinates of the two end points - find the gradient of a straight line gradient = (increase in y) $\div$ (increase in x) - recognise that equations of the form $y = mx + c$ are straight line graphs with gradient m and intercept on the y-axis at the point (0, c) Write down the gradient and coordinates of the y intercept of $y = 3x + 5$; Write down the equation of the straight line with gradient 6 that passes through the point (0, 2) - recognise, generate points and plot graphs of linear and quadratic functions To include $x = k$, $y = c$, $y = x$, $y - x = 0$ Including completion of values in tables and equations of the form $ax + by = c$
Assessment	Each week students will answer exam style questions on the topic they are studying in class.

Opportunities	Mock tests to practice answering exam style questions in timed conditions.
Textbooks Published Lesson Resources	Edexcel International GCSE (9-1) Mathematics A Student Book 1 & 2

Home Learning Resources	Dr Frost – Homework and independent learning Save My Exams Specific Links to Oak Academy
Knowledge organisers	Insert links here. No International GCSE specific KO's available. Edexcel GCSE can be used

Autumn 1

Week Number	Learning Overview / objective (outlined above)	What should pupils know, understand and be able to do by the end of the week?
1	Integers and place value	By the end of this week, students should be able to: Identify and use; integers (positive, negative and zero), place value, directed numbers, the four rules of addition, subtraction, multiplication and division, brackets and the hierarchy of operations, the terms 'odd', 'even', 'prime numbers', 'factors' and 'multiples', prime factors, common factors and common multiples
2	Decimals	By the end of this week, students should be able to Identify and use: decimal notation, understand place value, order decimals, convert a decimal to a fraction or a percentage (Terminating decimals only), recognise that a terminating decimal is a fraction
3	Special numbers and powers	By the end of this week, students should be able to identify and use: square numbers and cube numbers, calculate squares, square roots, cubes and cube roots, index notation and index laws for multiplication and division of positive and negative integer powers including zero

4	Fractions	By the end of this week, students should be able to identify and use: equivalent fractions, simplifying a fraction by cancelling common factors, mixed numbers and vulgar fractions, common denominators, order fractions and calculate a given fraction of a given quantity, express a given number as a fraction of another number
5	Percentages	By the end of this week, students should be able to: express a given number as a percentage of another number, express a percentage as a fraction and as a decimal
6	Ratio	By the end of this week, students should be able to: use ratio notation, express in the form 1 : n, divide a quantity in a given ratio or ratios
7	Proportion	By the end of this week, students should be able to: use the process of proportionality to evaluate unknown quantities, calculate an unknown quantity from quantities that vary in direct proportion, solve word problems about ratio and proportion

Autumn 2

Week Number	Learning Overview / objective (outlined above)	What should pupils know, understand and be able to do by the end of the week?
1	Arithmetic of fractions	By the end of this week, students should be able to: Add, subtract, multiply and divide fractions and mixed numbers, convert a fraction to a decimal or a percentage
2	Set language and Venn diagrams	By the end of this week, students should be able to use and understand:

		set notation, universal set and the empty set and the symbols, complement of a set, Venn diagrams to represent sets
3	Algebraic manipulation	By the end of this week, students should be able to: use index laws, evaluate expressions by substitution, collect like terms, multiply a single term over a bracket, Expand and simplify a double bracket
4	Algebraic manipulation & Equations and inequalities	By the end of this week, students should be able to: Factorise fully, understand the concept of a quadratic expression and be able to factorise
5	Equations and inequalities	By the end of this week, students should be able to: solve linear equations, with integer or fractional coefficients, in one unknown in which the unknown appears on either side or both sides of the equation
6	Real life graphs & Straight line graphs	By the end of this week, students should be able to: interpret information presented in a range of linear and non-linear graphs. To include speed/time and distance/time graphs and draw and interpret straight line conversion graphs. To include currency conversion graphs
7	Straight line graphs	By the end of this week, students should be able to: determine the coordinates of the midpoint of a line segment, find the gradient of a straight line, recognise that equations of the form $y = mx + c$, recognise, generate points and plot graphs of linear and quadratic functions



Year 10 HIGHER Maths Medium Term Plan

Autumn Term

Learning Overview	Decimals • convert recurring decimals into fractions Fractions and percentages • Mixed arithmetic • use repeated percentage change Notes • solve compound interest problems Ratio and proportion • set up problems involving direct or inverse proportion and relate algebraic solutions to graphical representation of the equations Surds and powers • understand the meaning of surds • manipulate surds, including rationalising a denominator • use index laws to simplify and evaluate numerical expressions involving integer, fractional and negative powers Degree of accuracy • solve problems using upper and lower bounds where values are given to a degree of accuracy Set language, notation and Venn diagrams • understand sets defined in algebraic terms, and understand and use subsets • use Venn diagrams to represent sets and the number of elements in sets • use the notation $n(A)$ for the number of elements in the set A • use sets in practical situations
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	Algebraic manipulation • use algebra to support and construct proofs • understand the process of manipulating formulae or equations to change the subject, to include cases where the subject may appear twice or a power of the subject occurs Linear equations • calculate the exact solution of two simultaneous equations in two unknowns • interpret the equations as lines and the common solution as the point of intersection Linear graphs • find the gradients of graphs • find the intersection points of two graphs, one linear and one non-linear and recognise that the solutions correspond to the solutions Quadratic equations, inequalities and graphs • solve simultaneous equations in two unknowns, one equation being linear and the other being quadratic • solve quadratic inequalities in one unknown and represent the solution set on a number line • identify harder examples of regions defined by linear inequalities
Assessment Opportunities	Each week students will answer exam style questions on the topic they are studying in class. Mock tests to practice answering exam style questions in timed conditions.
Textbooks Published Lesson Resources	Edexcel International GCSE (9-1) Mathematics A Student Book 1 & 2

Home Learning Resources	Dr Frost – Homework and independent learning Save My Exams Specific Links to Oak Academy	
Knowledge organisers	Insert links here. No International GCSE specific KO's available. Edexcel GCSE can be used	

Autumn 1

Week Number	Learning Overview / objective (outlined above)	What should pupils know, understand and be able to do by the end of the week?
1	Decimals, Fractions and percentages	By the end of this week, students should be able to: convert recurring decimals into fractions, use repeated percentage change, solve compound interest problems
2	Ratio and proportion	By the end of this week, students should be able to: Solve direct or inverse proportion problems and relate algebraic solutions to graphical representation of the equations
3	Ratio and proportion & Surds and powers	By the end of this week, students should be able to: understand the meaning of surds
4	Surds and powers	By the end of this week, students should be able to: manipulate surds, including rationalising a denominator, use index laws to simplify and evaluate numerical expressions involving integer, fractional and negative powers
5	Degree of accuracy	By the end of this week, students should be able to: solve problems using upper and lower bounds
6	Set language, notation and Venn diagrams	By the end of this week, students should be able to: understand sets defined in algebraic terms, and understand and use subsets, use Venn diagrams to represent sets and the number of elements in sets
7	Set language, notation and Venn diagrams cont..	By the end of this week, students should be able to: use the notation $n(A)$ for the number of elements in the set A, use sets in practical situations

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Autumn 2

Week Number	Learning Overview / objective (outlined above)	What should pupils know, understand and be able to do by the end of the week?
1	Algebraic manipulation	By the end of this week, students should be able to: use algebra to support and construct proof,
2	Algebraic manipulation cont..	By the end of this week, students should be able to: understand the process of manipulating formulae or equations to change the subject
3	Linear equations	By the end of this week, students should be able to: calculate the exact solution of two simultaneous equations in two unknowns
4	Linear equations cont..	By the end of this week, students should be able to: interpret the equations as lines and the common solution as the point of intersection
5	Linear graphs	By the end of this week, students should be able to: find the gradients of graphs, find the intersection points of two graphs
6	Quadratic equations, inequalities and graphs	By the end of this week, students should be able to: solve simultaneous equations in two unknowns, one equation being linear and the other being quadratic
7	Quadratic equations, inequalities and graphs cont..	By the end of this week, students should be able to:

		solve quadratic inequalities in one unknown and represent the solution set on a number line, identify harder examples of regions defined by linear inequalities
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