**JKHS MATHS DEPARTMENT CURRICULUM INTENT.**

**Students deserve a creative and ambitious mathematics curriculum, rich in skills and knowledge, which ignites curiosity and prepares them well for everyday life and future employment. Our mathematics curriculum will give students the opportunity to:**

- become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. Our spiral curriculum does this.
- reason mathematically by following a line of questioning and processing and developing an argument, justification or proof using mathematical language.
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing confidence and fluidity, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- can communicate, justify, argue and prove using mathematical vocabulary.
- develop their character, including resilience, confidence and independence, so that they contribute positively to the life of the school, their local community and the wider environment.
- apply curriculum knowledge to everyday occurrences with cross-curricular learning on topics including money (tax, exchange rates, budgeting & financial planning).
- stretch those more able with opportunities to excel across national events (UKMC) and support those who require further support whilst garnering the same level of enthusiasm, support and learning opportunities for all.
- Create multiple opportunities for students to study Maths post-16 to continue their mathematical development, irrespective of ability. A-Level Maths, Further Maths, Core Maths and support for students resitting Maths cover all.

# JKHS MATHS – KS4 Higher

**Prior Learning:**

At the start of KS4 students are expected to have a secure knowledge in the following areas of mathematics:

**Algebra**:

- Be able to identify and plot coordinates in all four quadrants
- Be able to simplify, expand and factorise expressions, including with indices
- Be able to rearrange equations and use these to solve problems.
- To solve quadratics and linear equations.
- To solve simultaneous equations algebraically.
- Be able to calculate the gradient of a linear function between two points.
- Be able to draw real life, linear and quadratic graphs.
- Be able to find term to term and nth term rules of linear sequences

**Shape space and Measur**e:

- Be able to use Pythagoras' Theorem and trigonometry
- Have knowledge of speed = distance/time, density = mass/volume.
- Be able to recognise 2D and 3D shapes and their properties.
- Recall and apply angle facts
- Be able to recognise and enlarge shapes and calculate scale factors.
- To have knowledge of how to calculate area and volume in various metric measures.
- Be able to measure lines and angles, and use compasses, ruler and protractor to construct standard constructions.
- Recall and apply transformations

**Number:**

- Be able to find a fraction and percentage of an amount and relate percentages to decimals.
- Be able to simplify surds.
- Be able to use negative numbers with all four operations and apply BIDMAS
- Work with numbers in standard form
- Express numbers as products of prime factors and use to find HCF and LCM

**Ratio and proportion:**

- Compare and divide in ratios.
- Use proportion to find best buys and direct proportion links

**Statistics:**

- Compare data from data displays and lists.
- Represent and interpret data in tables, graphs, pictograms and pie charts

| Year 10 Higher | | | | | | |
|---|---|---|---|---|---|---|
| Half-term | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Unit | Probability, formulae & quadratics | Circles and equations | Ratio & factors, multiples, primes | Straight-line graphs, Pythagoras & Circle theorems. | Sequences and scatter graphs. | 3D shape, indices, surds and standard form |
| Learning Focus | Probability experiments Expected outcomes Theoretical probability Mutually exclusive events<br><br>Substituting into formulae<br>Using standard formulae Equations, identities and functions<br>Expanding double brackets<br>Factorising into double brackets<br>Algebraic fractions | Area of a circle<br>Circumference<br>Parts of a circle<br>Area and perimeter of a sector<br>Constructions<br>Loci<br><br>Solving linear equations<br>(1 step, 2 step, brackets, fractional and unknown both sides)<br>Inequality number lines<br>Solve inequalities | Proportion<br>Ratio<br>Percentage change<br>Reverse percentages<br><br>Factors<br>Multiples<br>Prime numbers<br>Prime factor decomposition<br>Powers and roots<br>Basic surds | Drawing straight-line graphs<br>Equations of a straight line<br>Linear functions (draw, points on line, intersection)<br>Kinematic graphs<br>Real life graphs<br><br>Pythagoras<br>Enlargements<br>Circle theorem | Sequence rules<br>Nth term<br>Special sequences<br>Quadratic sequences<br><br>Frequency diagrams<br>Averages and spread<br>Scatter graphs and correlation<br>Time series | 3D shapes<br>Volume of a prism<br>Surface area<br>Cones/ pyramid<br>Frustums<br>Sphere<br><br>Calculating with roots and indices<br>Exact calculations<br>Standard form<br>Surds |
| Career links | Insurance<br>Actuary | Data analyst | Economist | Engineer and architecture | Data analyst | Engineer and architecture |
| Cross-curricular links | Science | D&T | Business studies | Science | Science & Geography | D&T |
| Assessment | Final week using AQA questions | Final week using AQA questions | Final week using AQA questions | Final week using AQA questions | Final week using AQA questions | EOY10 assessment (AQA Past papers) |

| Year 11 Higher | | | | | | |
|---|---|---|---|---|---|---|
| Half-term | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Unit | Equations and proportion | Trig, vectors, venns & probability | Graphs and Further Trigonometry | Revision | Revision | Revision |
| Learning Focus | Solving linear equations<br>Quadratic equations<br>Simultaneous equations<br>Inequalities<br><br>Compound units<br>Converting between units<br>Direct and inverse proportion<br>Rates of change<br>Growth and decay | Trig Right angle<br>Vectors<br><br>Sets<br>Possibility spaces<br>Tree diagrams<br>Conditional probability | Quadratic functions<br>Properties of quadratic functions<br>Cubic and reciprocal functions<br>Real-life graphs<br>Gradients and areas under graphs<br>Equation of a circle<br><br>Sine rule<br>Cosine rule<br>Area of a triangle | Revision SOW based on QLA data | Revision SOW based on QLA data | Revision SOW based on QLA data |
| Career links | Insurance<br>Actuary | Insurance<br>Actuary | Engineer | | | |
| Cross-curricular links | Science | Business studies | Science | | | |
| Assessment | Final week using AQA questions | Nov mock (AQA Past paper) | Final week using AQA questions | March mock (AQA Past paper) | | |

# JKHS MATHS – KS4 Foundation

Prior Learning: At the start of KS4 students are expected to have a secure knowledge in the following areas of mathematics:

Algebra:
- Be able to identify and plot coordinates in all four quadrants
- Be able to simplify, expand and factorise expressions, including with indices
- Be able to simple rearrange equations.
- To solve linear equations.
- Be able to calculate the gradient and y-intercept of a linear function
- Be able to draw real life and linear graphs.
- Be able to find term to term and nth term rules of linear sequences

Shape space and Measure:
- Be able to use Pythagoras' Theorem and trigonometry
- Have knowledge of speed = distance/time, density = mass/volume.
- Be able to recognise 2D and 3D shapes and their properties.
- Recall and apply angle facts
- Be able to recognise congruent and enlarge shapes.
- To have knowledge of how to calculate area and volume.
- Be able to measure lines and angles, and use compasses, ruler and protractor to construct standard constructions.
- Recall and apply transformations

Number:
- Be able to find a fraction and percentage of an amount and relate percentages to decimals.
- Be able to use negative numbers with all four operations and apply BIDMAS
- Work with numbers in standard form
- Express numbers as products of prime factors and use to find HCF and LCM

Ratio and proportion:
- Compare and divide in ratios.
- Use proportion to find best buys and direct proportion links

Statistics:
- Compare data from data displays and lists.
- Represent and interpret data in tables, graphs, pictograms and pie charts

| Year 10 Foundation | | | | | | |
|---|---|---|---|---|---|---|
| Half-term | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Unit | Probability, formula and quadratics | Circles and equations | Ratio & Factors, multiples, primes. | Straight-line graphs and Pythagoras. | Sequences and Scatter Graphs. | 3D shapes and standard form. |
| Learning Focus | Probability experiments<br>Expected outcomes<br>Theoretical probability<br>Mutually exclusive events<br><br>Substitution.<br>Using formulae<br>Equations, identities, and functions.<br>Rearrange<br>Expanding double brackets.<br>Factorising into double brackets | Area of a circle<br>Circumference of a circle<br>Parts of a circle<br>Area and perimeter of a sector<br>Constructions<br>Loci<br><br>Solving linear equations<br>(1 step, 2 step, brackets, fractional and unknown both sides)<br>Inequality number lines<br>Solve inequalities | Proportion<br>Ratio<br>Ratio and proportion<br>Percentage change<br>Reverse percentages<br><br>Factors<br>Multiples<br>Prime numbers<br>Prime factor decomposition<br>Powers and roots | <u>Graphs 1</u><br>Drawing straight-line graphs<br>Equations of a straight line<br>Kinematic graphs<br>Real life graphs<br><br><u>Shape</u><br>Pythagoras<br>Enlargements | <u>Sequences</u><br>Sequence rules<br>Finding the nth term<br>Special sequences<br><br><u>Handling data 2</u><br>Frequency diagrams<br>Averages and spread 2<br>Scatter graphs and correlation Time series | <u>Working in 3D</u><br>3D shapes<br>Volume of a prism<br>Surface area<br><br><u>Calculations 2</u><br>Calculating with roots and indices<br>Exact calculations<br>Standard form |
| Career links | Insurance<br>Actuary | Data analyst | Economist | Engineer and architecture | Data analyst | Engineer and architecture |
| Cross-curricular links | Science | D&T | Business studies | Science | Science & Geography | D&T |
| Assessment | Final week using AQA questions | Final week using AQA questions | Final week using AQA questions | Final week using AQA questions | Final week using AQA questions | EOY10 assessment (AQA Past papers) |

| Year 11 Foundation | | | | | | |
|---|---|---|---|---|---|---|
| Half-term | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Unit | All equations and proportion | Trigonometry & Venn Diagrams. | Graphs and revision | Revision | Revision | Revision |
| Learning Focus | Solving linear equations<br>Quadratic equations<br>Simultaneous equations<br>Inequalities<br><br>Compound units<br>Direct proportion<br>Inverse proportion<br>Growth and decay | Trigonometry<br>Vectors<br><br>Sets & Venns<br>Possibility spaces<br>Tree diagrams | Properties of quadratic functions<br>Sketching functions<br>Real-life graphs<br><br>Revision SOW based on QLA data | Revision SOW based on QLA data | Revision SOW based on QLA data | Revision SOW based on QLA data |
| Career links | Insurance<br>Actuary | Insurance<br>Actuary | Engineer | | | |
| Cross-curricular links | Science | Business studies | Science | | | |
| Assessment | Final week using AQA questions | Nov mock (AQA Past paper) | Final week using AQA questions | March mock (AQA Past paper) | | |