Biddulph High School Curriculum Intent

To deliver a broad and enriching curriculum through engaging and challenging lessons that provide a wide range of opportunities for all students to achieve their potential.
Students will all be prepared to take their next steps in a diverse and ever changing future ready to make a positive contribution to society.
Through a broad programme of extracurricular activities students will have the opportunities to showcase their talents and experience new challenges.
We value individuals and all that they can offer as well as supporting each other with kindness and empathy.

Curriculum Intent for Mathematics:

Mathematics is an integral facet of everyday life. We want our learners to be curious, confident and competent in Mathematics. Our aim is to ensure that all students are numerate and are secure in its applications so they are prepared for everyday life and future employment.

All teachers will follow the schemes of work provided by the department. This will ensure that all students receive the same high-quality provision. All units of work will provide a clear outline of the knowledge and skills required and assessments will ensure that this knowledge has been retained and that skills can be evidenced.

Teachers will ensure that gaps are closed through regular monitoring within the classroom. DINT activities will allow for interleaving and recap of previous learning. Misconceptions will be identified through effective questioning and the regular inspection of student work.

Mathematics **Long Term Overview**

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	High Frequency Exam Crossover Topics	Block D Number	Block D Ratio Block D Algebra	Block D Geometry	Block D Probability and Data Block E Number	Block E Algebra
10	Block E Geometry	Block E Probability and Data Block E Ratio and Proportion Block F Number	Block F Algebra	Block F Algebra	Block F Geometry	Block F Geometry
11	Block F Ratio and Proportion Block F Probability and Data Block G Number	Block G Algebra	Block G Algebra Block G Geometry	Block G Probability and Data		
12						
13						

Mathematics: Medium Term Overview

Year 9 Higher	Year 9 Foundation	Year 9 Foundation	Year 9 Foundation
Overview/Intent	This unit looks at topics that appear frequently on both tiers and potentially will need formulae applying that are nor given. This is to give pupils early exposure to these topics and plenty of time to master them in preparation for their GCSE no matter what tier they sit. At every assessment point, the assessment will include these topics.		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):

Students will be able to:

- Convert between standard form and ordinary number. Negative and positive powers
- Convert ordinary numbers to standard form
- Expand a bracket by a number/variable/numbered variable scalar.
- Expand two binomials.
- Express a number as a product of tis prime factors.
- To understand how to use the prime factors of two numbers to find the HCF and LCM.
- To solve HCF and LCM contextual problems.
- To accurately use their calculator to find any percentage of any amount.
- To find a fraction of an amount.
- Use a fraction of amount given to solve problems.
- To add points accurately to a scatter graph.
- To identify the correlation and any outliers on a scatter graph.
- To draw a LOBF and use it to estimate outcomes.
- To use the formula to find the area of a circle.
- To use the formula to find the circumference of a circle.
- To use the formula, or any appropriate method, to find the area of a trapezium.
- How to construct the perpendicular bisector of a line, angle bisector and the region from a point.
- To accurately apply the constructions to solve contextual problems.

Essential Skills (what must students be able to demonstrate):

- The difference between Standard Form and Ordinary numbers
- Expanding One/Two Binomials
- Collecting Like Terms
- Express a Number as a Product of its Prime Factors.
- Find the HCF and LCM and apply to a contextual problem.
- Find any % of an Amount using a calculator.
- Find any fraction of an amount.
- Use a fraction of amount given to solve problems.
- Complete scatter graphs, identify the correlation, identify outliers, draw and use a LOBF.
- Find the area of a circle.
- Find the circumference of a circle.
- Find the area of trapezium.
- To construct the perpendicular bisector of a line, angle bisector and the region from a point.
- To apply the above constructions to solve contextual problems.

Lessons:

- Standard Form Conversions
- Expanding a Single Bracket
- Expanding Two Single Brackets and Simplifying
- Expanding Double Brackets
- Expressing a Number as a Product of its Prime Factors.
- Finding the HCF and LCM from Prime Factorisation
- HCF and LCM in Context
- Finding the Percentage of an Amount (Calculator)
- Finding and Using a Fraction of an Amount
- Scatter Graphs
- Area of a Circle
- Circumference of a Circle
- Area of a Trapezium
- Perpendicular Bisector, Angle Bisector and Region from a Point.
- Loci
- Probability Trees
- Simplify a Ratio, including different units and in the form 1:n
- Sharing an Amount in a Ratio
- Sharing in a Ratio when you are given the difference between two or one share.

• Understand that groups of branches on a probability tree add to 1. • You multiply the probabilities on a probability tree when you move along the branches. • To simplify a ratio as fully as possible, including when the units are different, or to find n when required. • To share any amount in a ratio provided. • To reverse engineer an amount that has been share to find the original value.	• To accurately complete a probability tree. • To use a completed probability tree to solve problems. • To simplify any ratio as much as possible or to find the value of n when required. • To accurately apply the method to share an amount in a given ratio. • To use the difference in the final amounts or one share to find the total that was shared or another share. **Terminology:** Key Words: Convert, Powers, Standard Form, Expand, Like Terms, Binomials, Variable, Prime, Factor, HCF, LCM, Percentage, Decimal, Fraction, Numerator, Denominator, Scatter, Outlier, Correlation, Area, Circumference, Radius, Diameter, Parallel, Perpendicular Height, Perpendicular Bisector, Angle Bisector, Region, Loci, Constructions, Probability, Simplify, Ratio, Share.	
Careers Links: Students will look at an example of a Profit and Loss breakdown	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Autumn Term 2	Unit Title: Block D Number	No of Lessons: 20
Overview/Intent	This unit builds upon and consolidates topics covered in KS3 allowing students to improve their confidence applying Mathematical techniques		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Multiply a decimal and integer by a decimal
- Round integers and decimals to a given number of significant figures and decimal places
- Perform calculations in standard form for all operations including significant figures
- Perform calculations in standard form for all operations including significant figures
- Find a percentage of an amount using Calc and NC methods
- Round values to 1 significant figures to estimate a calculation
- Find the Percentage change between 2 numbers using Calculator and Non Calculator methods
- Add and Subtract fractions involving mixed numbers with different denominators
- Multiply and Divide Fractions involving mixed numbers with different denominators
- Use laws of indices
- Express a number as a product of its prime factors in index form
- Find the Highest Common Factor using prime factors e.g Venn Diagram method
- Find the Lowest Common Multiple using prime factors
- Simplify a surd

Essential Skills (what must students be able to demonstrate):

- Appropriate multiplication strategies
- Accurately round to a given number of decimal places/significant figures.
- Accurately calculate with standard form
- Find a % of amount
- Estimate the answer to a problem posed.
- Find a percentage change.
- Apply the four operations to fractions.
- Express a number as product of its prime factors.
- Use an appropriate method to find the HCF/LCM.
- Express a surd in its simplest form.

Terminology:
Key Words: Integer, Significant Figure, Estimate, Approximate, Index/Indices, Factor, Multiple, Surd, Square Number

Lessons:

- Multiplication
- Significant Figures/Decimal places
- Standard Form calculations
- % of an amount
- Estimation
- Find a Percentage change
- Add/Subtract fractions
- Multiply/Divide Fractions
- Laws of Indices
- Prime Factor decomposition
- HCF/LCM
- HCF/LCM (Exam questions)
- Introduction to surds

Careers Links:

Enrichment:

MYPB: Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Spring Term 1 Part 1	Unit Title: Block D Ratio	No of Lessons: 11
Overview/Intent	This unit builds upon and consolidates topics covered in KS3 allowing students to improve their confidence applying Mathematical techniques		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Convert decimalised time to standard units e.g 3.2 hours = 3 hours 12 minutes
- Convert between metric hours for speed e.g. 3km/h to m/s
- Perform conversions between differing measure of area and volume
- Perform calculations involving £/l
- Use the link between Speed Distance and Time to find unknown values Calc and Non Calc methods
- Convert to the same units of measure write in the form 1:n or n:1
- Share a given amount using a ratio e.g divide £50 by the ratio 3:10
- Express ratios of the form A:B and B:C in the form A:B:C
- Application of ratios
- Understand the difference between simple and compound interest and its application
- Use Direct and Inverse proportion in context

Essential Skills (what must students be able to demonstrate): How to

- Convert decimalised time into hours and minutes
- Convert between different units of metric speeds
- Convert between different units of measurement
- Accurately apply the relationship between speed, distance and time
- Simplify ratios into their simplest form/in the form of 1:n including ratios with different units
- Share any amount in a given ratio
- Compare and combine 2 ratios to solve problems.
- Understand the difference between simple and compound interest and accurately solve these problems.
- Solve direct and inverse contextual problems.

Terminology:
Key Words: Simple Interest, Compound Interest, Direct Proportion, Inverse Proportion.

Lessons:

- Convert decimalised time to standard units
- Convert km/s to metres/hour
- Conversions between standard measurements
- calculations with Compound measurements
- Speed/Distance/Time
- Simplifying ratios
- Sharing in a given ratio
- Compare 2 ratios
- Application of ratio using examination questions
- Simple Interest and Compound Interest
- Inverse and Direct Proportion

Careers Links:

Enrichment:

MYPB: Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Spring Term 1 Part 2	Unit Title: Block D Algebra	No of Lessons: 17
Overview/Intent	This unit builds upon and consolidates topics covered in KS3 allowing students to improve their confidence applying Mathematical techniques		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Find the nth term of a linear sequence
- Expand and simplify 2 single brackets e.g 3(2x + 5) - 2(2x - 3)
- Expand 2 binomials including (3x + y)(2x - 3y)
- Factorise a quadratic equation where the coefficient of x^2 is 1
- Solve 2 step equation of the form 5 - 3x = 14 including negative solutions
- Solve 3 step equation of the form 5(3a + 5) = 2(3a - 4) including fractional and negative solutions
- Identify an inequality from a number line
- Solve inequalities and represent on a number line.
- Rearrange SUVAT formulae
- Substitution involving SUVAT formulae and other science related formulae
- Solve simultaneous equations where the coefficients of x or y are equivalent (positive solutions only)
- Find the gradient between two points. Written points and points from a graph as in Physics
- Find the equation of a line between two points that are written and from a graph.
- Construct a Speed Distance Time Graph. Use the gradient to find acceleration
- Construct 2 linear graphs to solve simultaneous equations

Essential Skills (what must students be able to demonstrate): How to

- Use the term-to-term rule to find the nth term
- Expand single brackets and collect like terms
- Multiply out two brackets
- Factorise an expression into two brackets.
- Solve linear equations requiring more than 1 step to solve.
- Identify an inequality.
- Solve an inequality.
- Rearrange formula to change the subject.
- Accurately substitute values into formulae.
- Solve different types of simultaneous equations.
- Find the gradient between two points and use this to find the equation of a straight line.
- Accurately construct and interpret a Speed, Distance Time Graph.
- Use linear graphs to solve simultaneous equations.
- Complete a table of values for a quadratic graph and accurately draw the graph.

Lessons:

- Find the nth term
- Expanding 2 single brackets expand and simplify
- Expand 2 binomials
- Factorise 2 binomials
- Solve 2 step equations
- Solve 3 step equations
- Inequalities on a number line
- Solve inequalities
- Rearrange standard formula
- Substitution
- Solve Simultaneous Equations
- Find the gradient between 2 points
- Find the equation of a straight line
- Speed Distance Time graphs
- Graphical Simultaneous Equations
- Solve Harder Simultaneous Equations
- Quadratic Graphs

• Solve simultaneous equation where x and y coefficients differ. Only 1 row needs multiplying • Form and complete a table of values to plot a quadratic graph	**Terminology:** Key Words: Linear, Sequence, Binomial, Expand, Factorise, Solve, Inverse, Inequality, Rearrange, Simultaneous, Gradient, Substitution.	
Careers Links:	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Spring Term 2	Unit Title: Block D Geometry	No of Lessons: 26
Overview/Intent	This unit builds upon and consolidates topics covered in KS3 allowing students to improve their confidence applying Mathematical techniques		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Find missing lengths using Pythagoras' Theorem.
- Apply Pythagoras' Theorem to situation involving multiple triangles and by forming triangles
- Find the Circumference of a circle. Use the circumference to find a missing length
- Find the Perimeter of composite shapes including semi circles and quarter circles
- Find the area of standard 2D shapes
- Find the Area of a circle. Use the area of a circle to find the radius and diameter.
- Find the area of composite shapes including semi circles and quarter circles
- Find the Surface Area of a Prism
- Find the Volume of a cylinder
- Find the interior angles of a regular polygon
- Find the exterior angles of a regular polygon
- Find the sum of interior angles of a polygon
- Construct an angle bisector and find regions that satisfy a given condition
- Construct perpendicular bisectors and find regions that satisfy a given condition
- Use a compass and protractor to construct accurate triangle.
- Explain when angles are alternate or corresponding or co-interior to solve problems

Essential Skills (what must students be able to demonstrate): How to

- Apply Pythagoras' Theorem accurately.
- Find the circumference and area of a full/semi/quarter circle.
- Find the area of standard 2D shapes.
- Find the area and perimeter of composite shapes.
- Using the face areas to find the surface area of prisms.
- Find the volume of a cylinder.
- Understand how to find the size of an interior and exterior angle of a regular polygon.
- How to use a compass to draw arcs to accurately construct loci.
- Apply the relationship between alternate/corresponding/co-interior angles to solve problems.
- To understand the rules for measuring bearings.
- To use trigonometric functions to find the length of a right angled triangle.
- To represent a vector as an arrow and as a column.
- To accurate add/subtract/apply a scalar to a vector

Lessons:

- Pythagoras' Theorem
- Circumference of a circle
- Perimeter of composite shapes
- Area Review
- Area of a circle
- Area of composite shapes
- Surface Area of Rectangular/Triangular Prism
- Volume of a cylinder
- Interior angles of regular polygons
- Exterior angles of regular polygons
- Angle sum of polygons
- Angle Bisector
- Perpendicular Bisectors
- Constructing Triangles
- Alternate angles, Corresponding angles and Co-Interior
- Bearings
- Trigonometry
- Representing Vectors
- Vector Arithmetic including scalar
- Column Vector notation
- Similar Triangles
- Translation
- Rotations
- Enlargement + non integer SF
- Reflection

• Use a protractor to construct a bearing. Use a scale to identify the location of a point. • Introduction to Trigonometry. Find missing lengths only (Note Set 1 and 2 must not use formula triangles) • Use a diagram to identify a column vector. Draw a vector using column vector notation • Use Vector Arithmetic to find 1 or 2 unknowns • Draw the resultant of a column vector e.g a + 2b • Understand the definition of similarity and Scale Factor and find missing lengths • Describe and perform a Translation • Describe and perform a rotation • Perform and Describe an enlargement with positive integer and fractional scale factors • Describe and perform a Reflection	• To understand the relationship between similar triangles to find missing lengths. • To accurately apply and describe all of the four transformations. **Terminology:** Key Words: Pythagoras, Circumference, Diameter, Radius, Area, Composite, Surface Area, Volume, Column Vector, Bisector, Perpendicular, Arc, Alternate, Corresponding, Co-Interior, Bearing, Sine, Cosine, Tangent, Opposite, Adjacent, Hypotenuse, Scalar, Similar, Translation, Rotation, Reflection, Enlargement, Scale Factor	
Careers Links:	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Summer Term 1 Part 1	Unit Title: Block D Probability and Data	No of Lessons: 10
Overview/Intent	This unit builds upon and consolidates topics covered in KS3 allowing students to improve their confidence applying Mathematical techniques		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Construct a scatter graph, explain about extrapolation and unreliable estimates from a LOBF
- Interpret values and make inferences from a pie chart. Construct a pie chart from a frequency table and bar chart
- Complete a frequency tree and find theoretical probabilities
- Use a tree diagram to find the probability of independent events
- Construct a Venn Diagram and find the probability of an event.
- Find the mean, mode and median from a frequency table

Essential Skills (what must students be able to demonstrate): How to

- Accurately plot points on a scatter graph and describe the correlation.
- Use a LOBF to estimate an outcome.
- Explain why extrapolation is unreliable.
- Draw an accurate pie chart from a frequency table/bar chart.
- Complete a frequency table from a Pie Chart.
- Accurately complete a frequency tree and find probabilities.
- Accurately complete a probability tree and find probabilities.
- Accurately complete a Venn diagram and find probabilities.
- Find the mean, mode and median from a frequency table.

Terminology:
Key Words: Correlation, Extrapolation, Frequency, Theoretical Probability, Independent Events, Venn Diagram, Mode, Median, Mean

Lessons:

- Draw and use a Scatter Graph to find missing values
- Pie Charts
- Frequency Trees - Find Probability
- Simple Tree Diagrams
- Venn Diagrams - Find Probability
- Mean/Mode/Median from a frequency table

Careers Links:

Enrichment:

MYPB: Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Summer Term 1 Part 2	Unit Title: Block E Number	No of Lessons: 10
Overview/Intent	This unit expands upon Mathematical content from previous blocks and pushes students to explore new concepts.		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Express the change between two values as a percentage (Calc and Non Calc methods)
- Show clear and concise calculations using values rounded to 1significant figure
- Express a rounded value using an error interval and perform calculations using bounds
- Use knowledge of fraction operations to solve problems in context
- Evaluate integers raised to a negative power and fractional powers of 1/2 or 1/3
- Find an original value using reverse percentages
- Simplify surds to the form k root p
- Correct values so that they are in Standard Form e.g. 54 x 10^3
- Perform Standard Form calculations and round to a given number of significant figures.

Essential Skills (what must students be able to demonstrate): How to

- Find a percentage change for an increase or decrease.
- Accurately round figures to calculate an estimate.
- State the error interval for any figure that has been rounded.
- Accurately apply their knowledge of fractions to solve contextual problems.
- Apply the laws of indices
- To work out an original value after a percentage increase/decrease has happened.
- To express surds in their simplest form.
- To accurately convert with standard form.
- To accurately calculate with standard form.

Terminology:
Key Words: Percentage Change, Significant Figures, Error Interval, Reverse Percentage, Multiplier, Surd

Lessons:

- Find a Percentage change
- Estimation review
- Error Intervals
- Fraction questions in context
- Laws of Indices
- Reverse Percentages
- Simplifying Surds
- Standard Form
- Standard Form calculations

Careers Links:

Enrichment:

MYPB: Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 9 Higher	Summer Term 2	Unit Title: Block E Algebra	No of Lessons: 20
Overview/Intent	This unit expands upon Mathematical content from previous blocks and pushes students to explore new concepts.		
Assessment	Students will complete an assessed piece of work during lesson time which will be marked in line with STAR.		

Essential Knowledge (what must students know):
Students will be able to:

- Solve quadratics of the form x^2 + bx + c = 0 including difference of 2 squares
- Plot linear graphs using x and y intercept and estimate solutions to simultaneous equations
- Construct a table of values to plot a quadratic graph and linear graph simultaneously
- Sketch a quadratic graph labelling roots and y - intercept
- Identify the shape of a reciprocal graph of the form y = 1/x
- Identify the shape of a positive and negative cubic graph
- Sketch the shape of a cubic/quadratic/reciprocal and linear graphs
- Factorise expressions of the form difference of 2 squares including 57^2 - 43^2
- Solve and represent inequalities visually up to the form 2<3x - 1 < 14
- Form and solve equations using Function Machines
- Form algebraic expressions involving Perimeter/Area/Angles
- Form algebraic expressions that involve simultaneous equations
- Change the subject of an equation/formula including roots and kinematics formulae
- Find the equation of a parallel line passing through a given point.

Essential Skills (what must students be able to demonstrate): How to

- Factorise and solve a quadratic equation, including difference of 2 squares
- Use intercepts to draw linear graphs.
- Use a table of values to accurately draw graphs.
- Sketch a quadratic graph using the roots and y intercept.
- Draw reciprocal and cubic graphs and understand their shape.
- Solve and accurately represent linear inequalities.
- Use a function machine with algebraic inputs and outputs.
- Form and solve equations for perimeter/area/angles.
- Form and solve simultaneous equations from contextual problems
- Accurately change the subject of formulae.
- Use the properties of parallel lines on graphs to find their equation.

Terminology:
Key Words: Quadratic, Factorise ,Linear, Intercept, Reciprocal, Cubic, Inequality, Simultaneous, Gradient

Lessons:

- Difference of 2 Squares
- Solve Quadratic Equations
- Plot Linear graphs using x and y intercept
- Quadratic Graphs and Linear Graph together
- Sketch Quadratics
- Reciprocal Graphs
- Cubic Graphs
- Identifying Graphs
- Solve Inequalities
- Function Machines - Algebraic input and output
- Form algebraic expression
- Forming and Solving Simultaneous Equations
- Change the subject
- Find the equation of parallel line

Careers Links:

Enrichment:

MYPB: Resilience, Self-Motivation, Communication, Motivation