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 B Number	Block B Number Block B Ratio	Block B Algebra	Block B Geometry Block B Probability and Data	Block C Number
10	Block C Ratio and Proportion Block C Algebra	Block C Geometry	Block C Probability and Data	Block D Number	Block D Ratio and Proportion	Block D Algebra
11	Block D Geometry	Block D Probability and Data Block E Number	Block E Algebra Block E Geometry	Block E Probability and Data Block E Ratio and Probability		
12						
13						

Mathematics: Medium Term Overview

Year 11 Foundation	Autumn Term 1	Unit Title: Block D - Geometry	No of Lessons: 25
Overview/Intent	This unit builds upon and consolidates topics covered in KS2/KS3 and Block B 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):

- 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
- 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 x 2
- 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 11 Foundation	Autumn Term 2	Unit Title: Block D – Probability and Data	No of Lessons: 10
Overview/Intent	This unit builds upon and consolidates topics covered in KS2/KS3 and Block B 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):

- 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:

- 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

BIDDULPH HIGH SCHOOL CURRICULUM DOCUMENTATION

Careers Links:	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 11 Foundation	Autumn Term 2	Unit Title: Block E - Number	No of Lessons: 15
Overview/Intent	This unit builds upon and consolidates topics covered in KS2/KS3 and Block B 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:

- 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):

- 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

BIDDULPH HIGH SCHOOL CURRICULUM DOCUMENTATION

Careers Links:	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 11 Foundation	Spring Term 1	Unit Title: Block E - Algebra	No of Lessons: 15
Overview/Intent	This unit builds upon and consolidates topics covered in KS2/KS3 and Block B 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:

- 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):

- 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:

Lessons:

- 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
- Difference of 2 squares
- 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

	Key Words: Quadratic, Factorise ,Linear, Intercept, Reciprocal, Cubic, Inequality, Simultaneous, Gradient	
Careers Links:	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 11 Foundation	Spring Term 1 + 2	Unit Title: Block E - Geometry	No of Lessons: 25
Overview/Intent	This unit builds upon and consolidates topics covered in KS2/KS3 and Block B 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:

- Form and solve 1 or 2 linear equations using column vector notation
- Find the surface area of a cylinder. Find the Surface Area given the area of the cross section
- Find the volume of a cone or sphere and use the volume to find the value of a radius or diameter
- Use multiple construction techniques to find the locus of points that satisfy them
- Perform and Describe one of the four transformations
- Describe a combination of transformations as a single transformation
- Construct a given bearing including scale measures. Find bearing from an accurate diagram
- Find the Area of a sector. Given the area find the angle or radius
- Find the Arc Length and Perimeter of a sector. Given the Arc Length find the angle or radius of a sector
- Find the Area of a composite shape
- Apply Pythagoras' Theorem to unfamiliar situations. E.g. Trapeziums
- Find the Perimeter of composite shapes including sectors
- Find angles using right angles trigonometry
- Derive, recall and apply exact trigonometric values to right angles triangles(Non Calc)

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

- Form and solve linear equations including vector notation
- Find the surface area of a cylinder
- Find the volume of a cone
- Find the volume of a sphere
- How to use constructions to identify a region
- Use and identify transformations
- Perform a combination of transformations
- How to draw a bearing
- Read a bearing
- Find the area of a sector
- Find the angle of a sector given the area or arc length
- Find the arc length and perimeter of a sector
- Use Pythagoras' Theorem in unfamiliar scenarios including a trapezium or cylinder
- Recall of exact Trig values
- How to describe the features of congruent triangles

Terminology:

Lessons:

- Vector Arithmetic
- Surface Area of a Cylinder
- Volume of a cone/Sphere
- Constructions and Loci
- Single Transformations Exam Questions
- Combination of Transformations
- Bearings
- Area of a sector
- Arc Length and Perimeter of a sector
- Area of composite shapes including sectors
- Pythagoras' Theorem
- Perimeter of composite shapes including sectors
- Trigonometry
- Exact Trig Values
- Congruent Triangles

• Explain from given features why triangles are congruent e.g SAS/SSS/ASA/RHS	Key Words: Equation, Identity, Vector, Cylinder, Surface Area, Volume, Construction, Transformation, Reflection, Rotation, Enlargement, Translation, Bearing, Sector, Arc Length, Perimeter, Scenario, Cylinder, Trapezium, Trigonometry, Congruent	
Careers Links:	**Enrichment:**	**MYPB:** Resilience, Self-Motivation, Communication, Motivation

Mathematics: Medium Term Overview

Year 11 Foundation	Spring Term 2	Unit Title: Block E – Probability and Data / Ratio and Proportion	No of Lessons: 10
Overview/Intent	This unit builds upon and consolidates topics covered in KS2/KS3 and Block B 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:

- Scatter Graphs
- Grouped Frequency table
- Compound Interest and Depreciation
- Density/mass/volume

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

- How to plot a scatter graph
- How to find a line of best fit,
- How to find a percentage from a scatter graph,
- Find the mean, modal class and median class from a grouped frequency table
- Use compound interest and percentage multipliers to find future and historic values.
- Use depreciation to find future and historic values
- Find Density, mass or volume given two of the other values.

Terminology:

Key Words: Correlation, Line of best fit, Coordinates, Mean, Modal Class, Median Class, Grouped Frequency, Multiplier, Compound Interest, Depreciation, Density, Mass, Volume

Lessons:

- Scatter Graphs
- Grouped Frequency table
- Compound Interest and Depreciation
- Density/mass/volume

Careers Links:

Enrichment:

MYPB: Resilience, Self-Motivation, Communication, Motivation