

Hailey Hall School  
Specialist Sports College



Believe Strive Achieve



# Hailey Hall School Maths Curriculum Booklet

## **Maths Curriculum - Intent**

We believe mathematical intelligence is expandable, and that every child can learn mathematics, given the appropriate learning experiences within and beyond the classroom. Our curriculum map reflects our high expectations for every child. Every student is entitled to master the key mathematical content for their age, by receiving the support and challenge they specifically need.

Our curriculum has three key principles

### **1. Deep Understanding**

Our practice embeds the importance of deep understanding, as equating progress with learning new procedures and rules means many students will miss out on a depth of understanding. We achieve this by allowing the pupils to represent concepts in a variety of different ways using both objects and pictures. We also support the development of functional memory using a spiral curriculum, allowing pupils to revisit topics in greater depth each year.

### **2. Mathematical thinking**

We believe that it is essential for students to develop mathematical thinking in and out of the classroom to fully master mathematical concepts. We want students to think like mathematicians, not just DO the maths. We believe that during the learning experience students should; explore, wonder, question, conjecture, experiment and make theories in order to guide their own journey

### **3. Mathematical Language**

We believe that pupils should be encouraged to use mathematical language throughout their maths learning to deepen their understanding of concepts.

The way students speak and write about mathematics has been shown to have an impact on their success in mathematics.. We therefore use a carefully sequenced, structured approach to introducing and reinforcing mathematical vocabulary throughout maths lessons, so students have the opportunity to work with word problems from the beginning of their learning.

Alongside these three key principles problem solving is at the heart of mathematics. By structuring our curriculum so that all students in a year group are learning the same content at the same time, they have longer to focus on each topic. Our aim is to create the optimal conditions for students to learn through problem solving and to learn to solve problems to develop lifelong transferable skills

Throughout our curriculum we also aim to ensure our pupils gain a love and appreciation for all the mathematics around them and will fully enjoy mathematics

## Year 7 Mathematics

### Why this subject is important:

- A good level of numeracy is required for all jobs.
- A good qualification in maths shows you can think quickly.
- A good qualification in maths shows you are able to solve problems.
- A good qualification in maths will often mean a higher salary when you start work

### What you will learn:

Unit name	Topics	Skills and understanding
Year 7 Maths	<ul style="list-style-type: none"> <li>• <a href="#">Round any number to the nearest 10, 100, 1000 and round a number with one decimal place to the nearest whole number</a></li> <li>• <a href="#">Count backwards through zero</a></li> <li>• <a href="#">Use columnar addition and subtraction with numbers up to four digits</a></li> <li>• <a href="#">Multiply two- and three-digit numbers by a one-digit number</a></li> <li>• <a href="#">Use known and derived facts to multiply and divide mentally</a></li> <li>• <a href="#">Write any number of tenths or hundredths as a decimal</a></li> <li>• <a href="#">Find families of common equivalent fractions</a></li> <li>• <a href="#">Add and subtract fractions with the same denominator</a></li> <li>• <a href="#">Find areas of rectilinear shapes by counting squares</a></li> <li>• <a href="#">Use a line of symmetry to complete a symmetric shape or pattern</a></li> <li>• <a href="#">Identify lines of symmetry in 2D shapes</a></li> <li>• <a href="#">Use coordinates in the first quadrant</a></li> <li>• <a href="#">Interpret and construct bar charts and time graphs</a></li> </ul>	<ul style="list-style-type: none"> <li>• Know the place value headings of ones, tens, hundreds and thousands</li> <li>• Know the Roman numerals I, V, X, L, C</li> <li>• <a href="#">Know multiplication facts up to <math>12 \times 12</math></a></li> <li>• Know division facts related to tables up to <math>12 \times 12</math></li> <li>• Know decimals equivalent to <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{3}{4}</math></li> <li>• Know adjacent time facts involving years, months, weeks, days, hours, minutes and seconds</li> <li>• Know 12- and 24-hour clock conversions</li> <li>• <a href="#">Know the names and connected properties of triangles</a> and <a href="#">quadrilaterals</a></li> <li>• Know the definitions of acute and obtuse angles</li> <li>• Know that area is measured in squares</li> <li>• Know that perimeter is a measure of length</li> </ul>

**How you will be assessed:**

You will be requested to complete a Learning Preview (at the beginning of each topic) and a Learning Review (at the end of the topic)  
You will be set regular GCSE questions for home learning.

**The final grade is calculated in the following way:**

You will be assessed after each topic. Teacher assessments and topic assessments will give a combined overall grade.

**How parents / carers can help:**

Provide them with a quiet place to do homework and revision

**Useful website and details of course books:**

Book: Edexcel Mathematics Foundation / Higher Course (Published by Pearson)  
BBC Bitesize

**Progression routes and career opportunities:**

You will need Maths qualifications for all jobs, whatever you apply for.  
Jobs that especially need maths are:  
Accountancy, Games designer, Engineering, Police, Pilot, Architect, Doctor, and Scientist etc.

**Who to contact and how if you have a query regarding your child:**

<b>Name</b>	<b>Position</b>	<b>Email Address</b>	<b>Telephone</b>
<b>Mr John Thurley</b>	<b>Maths Coordinator</b>	<a href="mailto:jthurley@haileyhall.herts.sch.uk">jthurley@haileyhall.herts.sch.uk</a>	<b>01992 465208</b>

## Year 8 Mathematics

### Why this subject is important:

- A good level of numeracy is required for all jobs.
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- A good qualification in maths shows you are able to solve problems.
- A good qualification in maths will often mean a higher salary when you start work

### What you will learn:

Name	Topics	Skills and understanding
8 Maths	<ul style="list-style-type: none"> <li>• Round any number to the nearest 10, 100, 1000 and round a number with one decimal place to the nearest whole number</li> <li>• Count backwards through zero</li> <li>• Use columnar addition and subtraction with numbers up to four digits</li> <li>• Multiply two- and three-digit numbers by a one-digit number</li> <li>• Use known and derived facts to multiply and divide mentally</li> <li>• Write any number of tenths or hundredths as a decimal</li> <li>• Find families of common equivalent fractions</li> <li>• Add and subtract fractions with the same denominator</li> <li>• Find areas of rectilinear shapes by counting squares</li> <li>• Use a line of symmetry to complete a symmetric shape or pattern</li> <li>• Identify lines of symmetry in 2D shapes</li> <li>• Use coordinates in the first quadrant</li> </ul>	<ul style="list-style-type: none"> <li>• Know the place value headings of ones, tens, hundreds and thousands</li> <li>• Know the Roman numerals I, V, X, L, C</li> <li>• Know multiplication facts up to <math>12 \times 12</math></li> <li>• Know division facts related to tables up to <math>12 \times 12</math></li> <li>• Know decimals equivalents of <math>1/2</math>, <math>1/4</math>, <math>3/4</math></li> <li>• Know adjacent time facts involving years, months, weeks, days, hours, minutes and seconds</li> <li>• Know 12- and 24-hour clock conversions</li> <li>• Know the names and connected properties of triangles and quadrilaterals</li> <li>• Know the definitions of acute and obtuse angles</li> <li>• Know that area is measured in squares</li> <li>• Know that perimeter is a measure of length</li> </ul>

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| <ul style="list-style-type: none"> <li>• Interpret and construct bar charts and time graphs</li> </ul> |
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### **Promoting British Values:**

- You will learn about how the National Census is collected, what their main elements are and how it is evaluated and used in Britain
- You will take part in out of class activities working with others towards a common goal e.g. orienteering course

### **How you will be assessed:**

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You will be set regular questions for home learning.

### **The final grade is calculated in the following way:**

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### **How parents / carers can help:**

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### **Useful website and details of course books:**

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BBC Bitesize

### **Progression routes and career opportunities:**

You will need Maths qualifications for all jobs, whatever you apply for.  
Jobs that specially need maths are:  
Accountancy, Games designer, Engineering, Police, Pilot, Architect, Doctor, and Scientist etc.

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## Year 9 Mathematics

### Why this subject is important:

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### Intent: What you will learn:

Unit name	Topics	Skills and understanding	Skills curriculum links
Year 9 Maths	<p>Numbers and the number system</p> <p>Calculating</p> <p>Calculating: division</p> <p>Algebraic proficiency: using formulae</p> <p>Solving equations and inequalities</p>	<ul style="list-style-type: none"> <li>• Multiply and divide numbers with up to three decimal places by 10, 100, and 1000</li> <li>• Use long division to divide numbers up to four digits by a two-digit number</li> <li>• Use simple formulae expressed in words</li> <li>• Generate and describe linear number sequences</li> <li>• Use simple ratio to compare quantities</li> <li>• Write a fraction in its lowest terms</li> </ul>	<p>Skills covered in year 10</p> <ul style="list-style-type: none"> <li>• Apply the four operations with decimal numbers</li> <li>• Add, subtract, multiply and divide with fractions and mixed numbers</li> <li>• Simplify and manipulate expressions by collecting like terms</li> <li>• Simplify and manipulate expressions by multiplying a single term over a bracket</li> <li>• Substitute numbers into formulae</li> <li>• Solve linear equations in one unknown</li> <li>• Write a quantity as a fraction or percentage of another</li> </ul>

	<p>Proportional reasoning</p> <p>Calculating fractions, decimals and percentages</p> <p><u>Exploring fractions, decimals and percentages</u></p> <p>Investigating angles</p> <p>Calculating space</p> <p>Investigating properties of shapes</p> <p>Mathematical movement</p>	<p>by cancelling common factors</p> <ul style="list-style-type: none"> <li>• Add and subtract fractions and mixed numbers with different denominators</li> <li>• Multiply pairs of fractions in simple cases</li> <li>• Find percentages of quantities</li> <li>• Solve missing angle problems involving triangles, quadrilaterals, angles at a point and angles on a straight line</li> <li>• Calculate the volume of cubes and cuboids</li> <li>• Use coordinates in all four quadrants</li> <li>• Calculate and interpret the mean as an average of a set of discrete data</li> </ul>	<ul style="list-style-type: none"> <li>• Write a quantity as a fraction or percentage of another</li> <li>• Add, subtract, multiply and divide with fractions and mixed numbers</li> <li>• Write a quantity as a fraction or percentage of another</li> <li>• Use multiplicative reasoning to interpret percentage change</li> <li>• Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines</li> <li>• Calculate surface area of cubes and cuboids with unknowns</li> <li>• Understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math></li> <li>• Calculate mean, median and mode from grouped data</li> </ul>
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	Measuring data		
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### **How you will be assessed:**

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## KS4 (Year 10/11) - Mathematics Edexcel Award/GCSE

### Why this subject is important:

- A good level of numeracy is required for all jobs.
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- A good qualification in maths will often mean a higher salary when you start work

### What you will learn:

Unit name	Topics	Skills and understanding
Term/Unit:	Types of Numbers	1. To be able to identify factors, multiples and prime numbers To be able to find squares and cubes To be able to find the LCM and HCF To be able to use index notations To be able to use index laws
	Integers	2. To be able to understand and order integers To be able to use BIDMAS To be able to multiply integers and decimals
	Reading scales and converting units	3. To be able to construct scale drawings To be able to convert units (imperial and metric)
	Introduction to algebra	4. To be able to use formulae and symbols correctly To be able to write and simplify expressions and linear equations
	Linear equations and inequalities	5. To be able to set up, rearrange and solve equations

	<p data-bbox="595 432 919 495">Angles, lines and angles</p> <p data-bbox="691 1171 826 1205">Symmetry</p> <p data-bbox="691 1507 890 1541">Collecting data</p> <p data-bbox="691 1843 962 1877">Averages and range</p>	<p data-bbox="997 192 1342 293">To be able to use linear equations to solve word problems</p> <p data-bbox="997 331 1391 528">6. To be able to measure and draw lines and angles to the nearest mm and degree To be able to name angles</p> <p data-bbox="997 533 1391 696">To be able to use metric language To understand the fact that the angle sum of a triangle is <math>180^\circ</math></p> <p data-bbox="997 701 1391 969">To be able to find missing angles in triangles To understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices To know the properties of all types of triangles</p> <p data-bbox="997 1003 1377 1272">7. To be able to recognise reflection symmetry of shapes To understand congruence To be able to identify rotational symmetry</p> <p data-bbox="997 1305 1391 1574">8. To be able to specify a problem and plan To be able to collect data from a variety of primary and secondary data To be able to process and represent data</p> <p data-bbox="997 1608 1391 1805">9. To be able to calculate mean, mode, median and range To be able to draw a stem and leaf diagram</p> <p data-bbox="997 1843 1391 2007">10. To be able to draw histograms, composite bar charts, frequency polygons, histograms and line graphs.</p>
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	<p>Charts and graphs</p> <p>Decimals</p> <p>Edexcel Award Exam practice</p>	<p>To be able to use graphs to compare distribution</p> <p>11. To be able to understand place value To be able to add, subtract, multiply and divide with decimals</p> <p>12. Past paper practice revision</p>
Unit:	<p>Algebra using powers and brackets</p> <p>Perimeter and area</p> <p>3D shapes</p> <p>Volume</p>	<p>1. To be able to use index laws To be able to write expressions using squares and cubes</p> <p>2. To be able to find areas and perimeters of rectangles, triangles, trapeziums, parallelograms and compound shapes</p> <p>To be able to solve a range of problems involving areas including cost of carpet type questions</p> <p>3. To know all properties of 2D and 3D shapes To use 2D representation of 3D shapes To be able to draw front and side elevations To be able to find the surface area of 3D shapes</p> <p>4. To be able to calculate the volume of prisms To understand how enlargement affects volume</p>

	<p>Pie charts</p> <p>Scatter graphs</p> <p>Distance graphs</p> <p>Fractions, Decimals Percentages</p> <p>Application of percentages</p> <p>Patterns and sequences</p> <p>Straight line graphs</p>	<p>5. To be able to present data in pie charts To understand how pie charts are used in real life</p> <p>6. To be able to draw and interpret scatter graphs To understand negative and positive correlation To be able to draw lines of best fit and be able to predict values</p> <p>7. To be able to read bus train timetables and plan journeys To be able to draw distance graphs</p> <p>8. To be able to convert between fractions decimals and percentages To be able to calculate percentages of given amounts</p> <p>9. To use percentages in life situations eg. VAT, value for profit or loss and interest</p> <p>10. To be able to generate sequences To find the <math>n^{\text{th}}</math> term of sequences</p> <p>11. To be able to plot and draw graphs of the form <math>y=mx + c</math> To be able to find the gradient of graphs</p>
Unit:	Real life graphs	<p>1. To be able to draw and interpret real life graphs To solve problems relating to mobile phone bills and bills</p>

	<p>Transformations</p> <p>Probability</p> <p>Circles</p> <p>Formulae</p> <p>Constructions</p> <p>Quadratic graphs</p>	<p>2.</p> <ul style="list-style-type: none"> <li>To be able to describe transformations</li> <li>To know rotation, reflection, translation and enlargement</li> <li>To understand scale factors</li> <li>To identify the equation of a line of symmetry</li> </ul> <p>3.</p> <ul style="list-style-type: none"> <li>To know probability</li> <li>To be able to find the probability of an event happening using relative frequency</li> <li>To use theoretical probability to include outcomes using dice, spinners and coins</li> </ul> <p>4.</p> <ul style="list-style-type: none"> <li>To be able to draw a circle given its radius or diameter</li> <li>To use <math>\pi</math> Pi on the calculator</li> <li>Find the circumference and areas of circles</li> </ul> <p>5.</p> <ul style="list-style-type: none"> <li>To derive a simple formula, including those with squares, cubes and roots</li> <li>To be able to substitute numbers into a formula</li> <li>To be able to change subject of a formula</li> </ul> <p>6.</p> <ul style="list-style-type: none"> <li>To be able to construct an angle, a bisector, perpendicular and parallel lines</li> <li>To be able to construct angles of <math>30^\circ, 45^\circ, 60^\circ, 90^\circ</math></li> </ul> <p>7.</p> <ul style="list-style-type: none"> <li>To be able to substitute values of x into a quadratic function to find the corresponding values of y</li> <li>To be able to draw graphs of quadratic functions</li> </ul> <p>8.</p>
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	Pythagoras' Theorem	<p>To understand and apply Pythagoras' Theorem</p> <p>To be able to use Pythagoras' theorem to find the hypotenuse or the length of the other sides</p> <p>To be able to apply Pythagoras' Theorem to practical situations</p> <p>9. Exam practice and revision</p>
	Exam practise	

### Promoting British Values:

- You will learn about how the National Census is collected, what their main elements are and how it is evaluated and used in Britain
- You will also learn about the cost of living, the Tax system and how it has an impact on the system if people do not comply with regulations.

### How you will be assessed:

You will be entered for number and measure level 1 and 2 and algebra level 2 as appropriate  
 You will take regular mock exams leading up to the date of exams  
 You will be set regular GCSE questions for home learning.

### The final (GCSE or Award) grade is calculated in the following way:

You will take Award exams January and May and will take your GCSE exams at the end of Year 11

### How parents / carers can help:

Provide them with a quiet place to do homework and revision

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## KS4 (Year 10/11) - Mathematics

### Edexcel Award/GCSE

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	Reading scales and converting units	3. To be able to construct simple drawings To be able to convert units (imperial and metric)
	4. Introduction to algebra	4. To be able to use brackets and symbols correctly To be able to write and simplify expressions and linear equations
		5. To be able to set up, rearrange and solve equations

	<p>5. Linear equations and inequalities</p> <p>6. Angles, lines and triangles</p> <p>7. Symmetry</p> <p>8. Collecting data</p> <p>9. Averages and range</p>	<p>To be able to use linear equations to solve word problems</p> <p>6. To be able to measure and draw lines and angles to the nearest mm and degree To be able to name angles To be able to use metric language To understand the fact that the angle sum of a triangle is <math>180^\circ</math> To be able to find missing angles in triangles To understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices To know the properties of all types of triangles</p> <p>7. To be able to recognise reflection symmetry of shapes To understand congruence To be able to identify rotational symmetry</p> <p>8. To be able to specify a problem and plan To be able to collect data from a variety of primary and secondary data To be able to process and represent data</p> <p>9. To be able to calculate mean, mode, median and range To be able to draw a stem and leaf diagram</p> <p>10. To be able to draw bar charts, frequency polygons, histograms and line graphs.</p>
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	<p>10. Charts and graphs</p> <p>11. Decimals</p> <p>12. Edexcel Award Exam practice</p>	<p>To be able to use graphs to compare distribution</p> <p>11. To be able to understand place value To be able to add, subtract, multiply and divide with decimals</p> <p>12. Past paper practice revision</p>
Term/Unit:	<p>Algebra using powers and brackets</p> <p>2. Perimeter and area</p> <p>3. 3D shapes</p> <p>4. Volume</p>	<p>1. To be able to use index laws To be able to write expressions using squares and cubes</p> <p>2. To be able to find areas and perimeters of rectangles, triangles, trapeziums, parallelograms and compound shapes</p> <p>To be able to solve a range of problems involving areas including cost of carpet type questions</p> <p>3. To know all properties of 2D and 3D shapes To use 2D representations of 3D shapes To be able to draw front and side elevations To be able to find the surface area of 3D shapes</p> <p>4. To be able to calculate the volume of prisms To understand how enlargement affects volume</p>

	<p>5. Pie charts</p> <p>6. Scatter graphs</p> <p>7. Distance graphs</p> <p>Fractions, Decimals and Percentages</p> <p>9. Application of percentages</p> <p>10. Patterns and sequences</p> <p>11. Straight line graphs</p>	<p>5. To be able to present data in pie charts To understand how pie charts are used in real life</p> <p>6. To be able to draw and interpret scatter graphs To understand negative and positive correlation To be able to draw lines of best fit and be able to predict values</p> <p>7. To be able to read bus and train timetables and plan journeys To be able to draw distance graphs</p> <p>8. To be able to convert between fractions decimals and percentages To be able to calculate percentages of given amounts</p> <p>9. To use percentages in life situations eg. VAT, value added, profit or loss and interest</p> <p>10. To be able to generate sequences To find the <math>n^{\text{th}}</math> term of sequences</p> <p>11. To be able to plot and draw graphs of the form <math>y=mx + c</math> To be able to find the gradient of graphs</p>
Term/Unit:	<p>1. Real life graphs</p> <p>4</p>	<p>1. To be able to draw and interpret real life graphs To solve problems relating to mobile phone bills and bills</p>

	<p>2. Transformations</p> <p>3. Probability</p> <p>4. Circles</p> <p>5. Formulae</p> <p>6. Constructions</p> <p>7. Quadratic graphs</p>	<p>2. To be able to describe transformations To know rotation, reflection, translation and enlargement To understand scale factors To identify the location of a line of symmetry</p> <p>3. To know probability To be able to find the probability of an event happening using relative frequency To use theoretical probability to include outcomes using dice, spinners and coins</p> <p>4. To be able to draw a circle given its radius or diameter To use <math>\pi</math> Pi on the calculator Find the circumference and areas of circles</p> <p>5. To derive a simple formula, including those with squares, cubes and roots To be able to substitute numbers into a formula To be able to change the subject of a formula</p> <p>6. To be able to construct an angle, a bisector, perpendicular and parallel lines To be able to construct angles of 30°, 45°, 60°, 90°</p> <p>7. To be able to substitute values of x into a quadratic function to find the corresponding values of y To be able to draw graphs of quadratic functions</p> <p>8.</p>
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	8. Pythagoras' Theorem	<p>To understand and apply all Pythagoras' Theorem</p> <p>To be able to use Pythagoras' theorem to find the hypotenuse or the length of the other sides</p> <p>To be able to apply Pythagoras' Theorem to practical situations</p>
	9. Exam practise	9. Exam practice and revision

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**Who to contact and how if you have a query regarding your child:**

Name	Position	Email Address	Telephone
Mr John Thurley	Maths Coordinator	<a href="mailto:jthurley@haileyhall.herts.sch.uk">jthurley@haileyhall.herts.sch.uk</a>	01992 465208