

Wave Trust

Maths Curriculum

Our Trust curriculum, used in Primary and the Regional APA Solo Maths Leads, is underpinned by our WAVE values, which also serve as powerful and unique drivers for our curriculum:



Be positive: We have the highest expectations of what our pupils are capable of, no matter what their starting points, and no matter how many fresh starts. Through our Curriculum offer, we will strive to develop unique talents; build confidence; character, aspiration; attainment and at KS4, also qualifications. We aim to prepare pupils for their next steps, and life in modern Britain. We believe every child can learn to read. In Maths, we aim to reengage pupils with Maths where needed, building a 'can do' approach and ensuring accurate assessment informs teaching.



Have empathy: We seek first to understand, then to be understood. Through our curriculum, we will develop empathetic learners who have an awareness, understanding and are considerate of themselves; their peers; our communities; as well as of the world around us all. In Maths lessons we create an atmosphere where students feel comfortable to express their thoughts, concerns, and questions.



Show respect: Our curriculum will support of students to respect themselves, each other and teach an understanding and awareness of diversity. In Maths this is demonstrated by listening to other people's ideas and explanations.



Work as one team: Our curriculum gives our students opportunities to work collectively together, through opportunities to talk, listen, and create. We will draw on every opportunity for learning, both planned and unplanned, to develop pupils' ability to reflect, engage and relate positively to one another. In Maths we work together through group discussions, peer teaching and collaborative problem solving. This is to build social skills, empathy and a sense of community within the classroom.



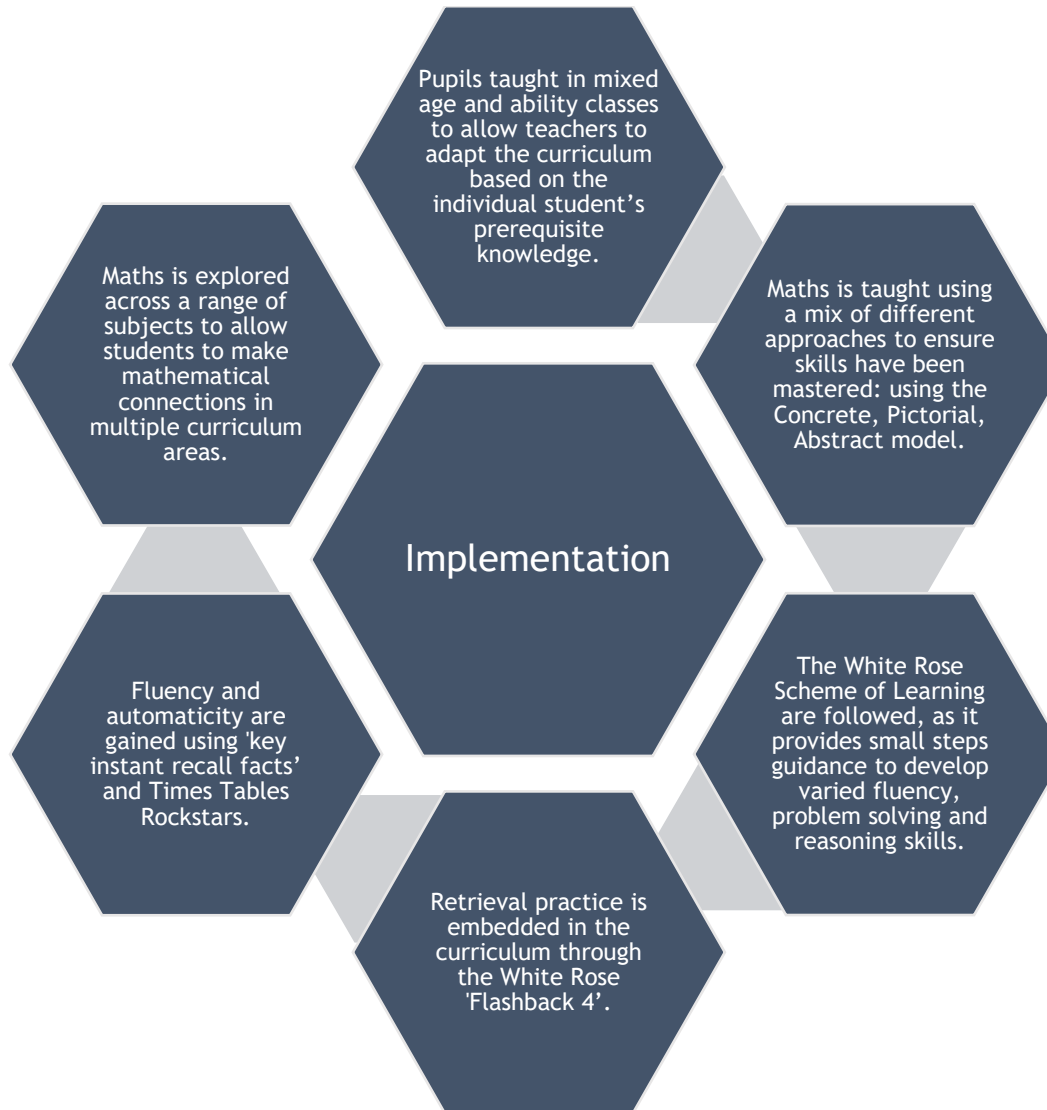
Be inclusive: We will strive to ensure our curriculum is accessible and meets the needs of all our learners. Not one size fits all, but skilfully adapted to meet individual need and SEND/SEMH need. In Maths we have high expectations of all our students and ensure an inclusive environment by using adaptive teaching to ensure all learners are able to access the curriculum.

Primary Maths Curriculum

‘What is mathematics? It is only a systematic effort of solving puzzles posed by nature.’
– Shakuntala Devi

The intent of our mathematics curriculum is to be a curriculum, which is accessible to all and will maximise the development of every child’s ability and academic achievement. We deliver lessons that are creative, engaging whilst identifying gaps in learning and work on these with the pupils. Many pupils in an APA have missed lessons or not been emotionally able to engage in learning due to the challenging behaviours and additional needs. Pupils can have fundamental gaps in their mathematical understanding that are significantly affecting their confidence and ability to move forward. To identify strengths in understanding and ability, as much as it is important to work on what pupils can’t do, we need to show them what they are capable of and CELEBRATE their successes. Building confidence and self-esteem is vital for the pupils in an APA in terms of longer-term engagement with learning. We want children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems. For pupils to be able to apply their mathematical knowledge to a wide range of subjects and understand that it is essential to everyday life and necessary for financial literacy and most forms of employment. As our pupil’s progress, our intention is for the pupils to have the ability to reason mathematically. This will help to support our pupils gain qualifications that are appropriate to their ability and potential. Ultimately our aim is to foster an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Maths Primary Curriculum Implementation Model...



The White Rose scheme covers all aspects of the national curriculum and is sequenced so that topics that rely upon other areas of maths are taught first, it is also structured so that the same topic is not always at the end of the year to minimise the chance of a topic not being covered. It has been designed by experts to develop conceptual understanding through the use concrete, pictorial and abstract representations. The schemes of work also support the development of reasoning and problem solving as well as fluency. The small steps approach which are sequenced in order of difficulty allows all pupils to learn at their own pace whilst still achieving high standards. This approach is particularly useful with mixed ability classes and enables our teachers to adapt the curriculum based on the pupil's prerequisite knowledge. Key concepts are interleaved throughout the curriculum to ensure the long-term retention of knowledge. We use the White Rose [Calculations Policies](#) to ensure a consistent approach that promotes progression in the teaching of calculations at KS1 and KS2.

The majority of our classes in our behaviour APA primary settings are structured as:

Keys Stage 1

Lower Key Stage 2

Upper Key Stage 2

At times, the above make up of classes, or in a 2 Teacher primary setting, this may vary.

For this reason, we run a rolling Year A and Year B Primary curriculum for Foundation Subjects and Science. In Maths and English, pupils are entirely taught at stage not age and thus planning is highly individualised by teachers.

Maths Overviews:

Years 1 and 2

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	NUMBER Place Value			NUMBER Addition and Subtraction						NUMBER Place Value and Multiplication		
Spring	NUMBER Division		NUMBER Place Value/Statistics		MEASUREMENT Length and Height	GEOMETRY Shape			NUMBER Fractions		Consolidation	
Summer	GEOMETRY Position and Direction	MEASUREMENT Time		Problem Solving		MEASUREMENT Weight, Volume, Mass, Capacity, and Temperature			Investigations and Consolidation			

Years 3 and 4

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	NUMBER Place Value			NUMBER Addition and Subtraction						NUMBER Multiplication and Division		
Spring	NUMBER Multiplication and Division		MEASUREMENT Length, Perimeter and Area		NUMBER Fractions			MEASUREMENT/NUMBER Mass and Capacity/Decimals		Consolidation		
Summer	NUMBER Decimals			MEASUREMENT Time		STATISTICS Statistics		GEOMETRY Position and Direction				

Years 5 and 6

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	NUMBER Place Value		NUMBER Four Operations				NUMBER Fractions					
Spring	NUMBER Fractions		NUMBER Decimals and Percentages			NUMBER Decimals		MEASUREMENT Converting Units	MEASUREMENT Area, Perimeter and Volume		STATISTICS Statistics	
Summer	GEOMETRY Properties of Shapes		GEOMETRY Position and Direction SATS		Investigations and Consolidation							

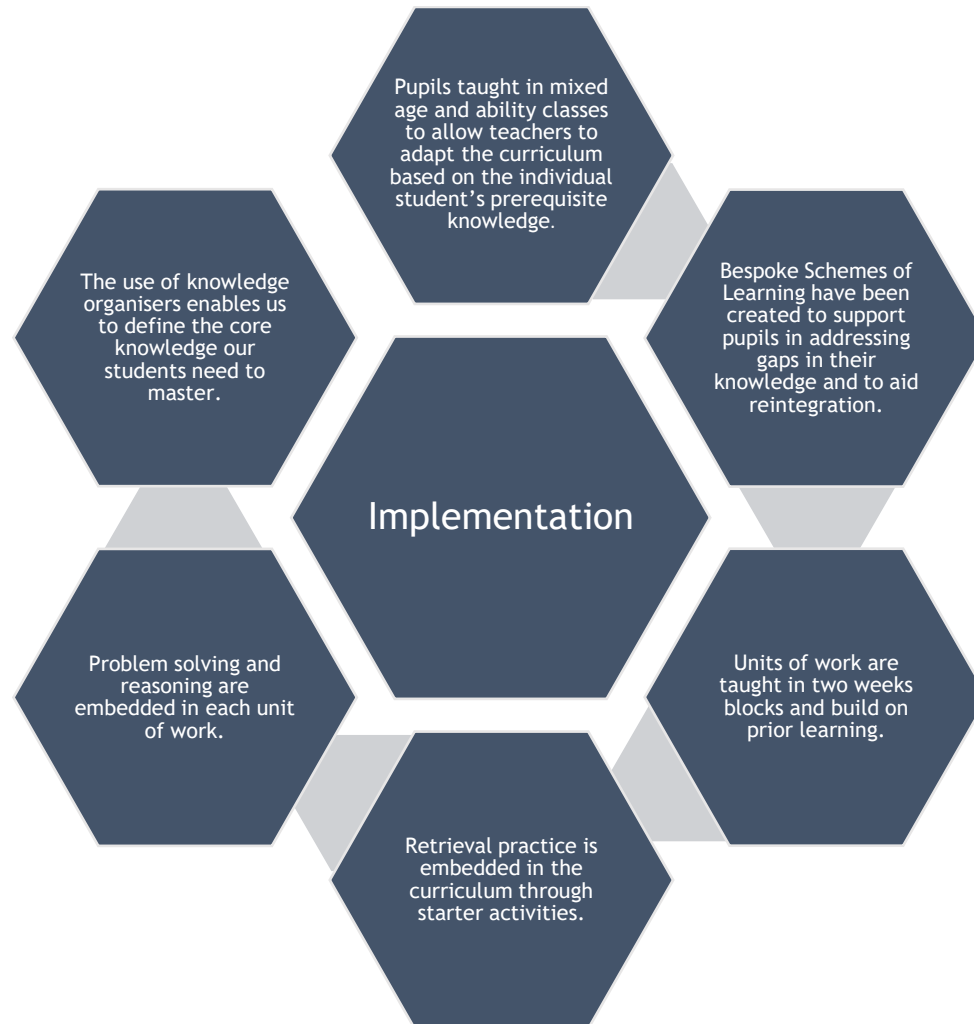
Secondary Maths Curriculum

'Pure mathematics is, in its own way the poetry of logical ideas.'

– Albert Einstein

The intent of our mathematics curriculum is to be a curriculum, which is accessible to all and will maximise the development of every child's ability and academic achievement. We deliver lessons that are creative, engaging whilst identifying gaps in learning and work on these with the pupils. Many pupils in an APA have missed lessons or not been emotionally able to engage in learning due to the challenging behaviours and additional needs. Pupils can have fundamental gaps in their mathematical understanding that are significantly affecting their confidence and ability to move forward. To identify strengths in understanding and ability, as much as it is important to work on what pupils can't do, we need to show them what they are capable of and CELEBRATE their successes. Building confidence and self-esteem is vital for the pupils in an APA in terms of longer-term engagement with learning. We want children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems. For pupils to be able to apply their mathematical knowledge to a wide range of subjects and understand that it is essential to everyday life and necessary for financial literacy and most forms of employment. As our pupil's progress, our intention is for the pupils to have the ability to reason mathematically. This will help to support our pupils gain qualifications that are appropriate to their ability and potential. Ultimately our aim is to foster an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Implementation



Key Stage 3

KS3 have 4-5 lessons a week and follow a scheme of work which is an amalgamation of the White Rose schemes for years 7/8/9. This ensures all aspects of the National Curriculum are covered and enables for differentiation in mixed ability and mixed year group classes. Each module is approximately 2 weeks in length and has been sequenced to build on prior knowledge for example they will learn how to use a protractor before being asked to construct a pie chart or how to convert between fractions, decimals, and percentages before talking probability. Each lesson begins with a starter which has been written to address gaps in knowledge and as part of a retrieval curriculum. The starters cover the current topic, one from 2 weeks prior and another from 4 weeks prior. However, with some KS3 students who have low levels of numeracy their starters may focus on a helping them to master a fundamental skill that is necessary for their progression such as knowing their times tables. Once a topic students will complete a problem solving or real-life based task to develop their mathematical reasoning and appreciation for the maths all around them. Our curriculum is designed to be adaptive and based on the prerequisite knowledge of the pupils we teach. Maths Leads in each setting rotate the below map in Year A and Year B, so pupils who are with us for longer than a year spiral and revisit the topics laid out below, further deepening their knowledge within the topic, rather than repeating content.

Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	NUMBER Calculations		GEOMETRY Constructions and Loci		STATISTICS Charts and Graphs		NUMBER Fractions, Decimals and Percentages		ALGEBRA Sequences, Functions and Graphs		GEOMETRY Measures	
Spring	NUMBER Types and Properties of Number		ALGEBRA Simplifying and Substitution		NUMBER Ratio and Proportion		GEOMETRY Lines, Angles and Shapes		NUMBER Rounding and Accuracy		ALGEBRA Forming and Solving Equations	
Summer	GEOMETRY Transformations		NUMBER Percentages		STATISTICS Averages		GEOMETRY Area and Perimeter		NUMBER Fractions	GEOMETRY Volume and Surface Area		STATISTICS Probability

Key Stage 4

KS4 are following a scheme of work based on the AQA GCSE objectives. Each module is approximately 2 weeks in length and has been sequenced to build on prior knowledge. Every lesson begins with a Corbett maths 5 a day starter which is differentiated according to ability, but not in a way that limits attainment. Using these starters serves to address any gaps in knowledge and as part of retrieval process which aims to embed key mathematical concepts in pupils' long-term memory. The main part of the lesson will focus on the current topic and will build on skills developed in the previous lesson (except at the start of the module). Due to a wide range of abilities in classes the work is differentiated by the level of support offered to pupils rather than by outcome for all pupils following the same scheme of work. Both year 10 and year 11 follow a one-year scheme of work to ensure that if a pupil is reintegrated into mainstream at the start of year 10 or joins us at the start of year 11, they are not disadvantaged by not being taught the entirety of the curriculum. This does not mean that pupils staying with us repeat the same work. Pupils are taught in small groups, and the work is carefully planned to add breadth and depth. Problem solving tasks or exam style question are used on a regular basis to help pupil improve their mathematical reasoning and to interleave different mathematical areas together. Our curriculum is designed to be adaptive and based on the prerequisite knowledge of the pupils we teach.

Year 10

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	NUMBER Types and Properties of Number		ALGEBRA Sequences, Functions and Graphs		GEOMETRY Lines, Angles and Shapes		NUMBER Fractions, Decimals and Percentages		STATISTICS Charts and Graphs		GEOMETRY Constructions and Loci	
Spring	NUMBER Calculations and Accuracy	GEOMETRY Transformations		ALGEBRA Simplifying and Substitution		NUMBER Ratio and Proportion		GEOMETRY Pythagoras and Trigonometry		ALGEBRA Equations and Inequalities		NUMBER Percentages
Summer	NUMBER Percentages	GEOMETRY Area and Perimeter		STATISTICS Probability	GEOMETRY Volume and Surface Area		NUMBER Fractions		STATISTICS Averages		GEOMETRY Measures	

Year 11

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	NUMBER Types and Properties of Number		ALGEBRA Sequences, Functions and Graphs		GEOMETRY Lines, Angles and Shapes		NUMBER Equivalent FDP	STATISTICS Charts, Graphs and Averages		GEOMETRY Constructions and Loci		NUMBER Rounding and Accuracy
Spring	GEOMETRY Transformations		ALGEBRA Simplifying and Substitution		NUMBER Ratio and Proportion		GEOMETRY Pythagoras and Trigonometry		ALGEBRA Equations and Inequalities		NUMBER Fractions and Percentages	
Summer	GEOMETRY Area, Perimeter & Volume	STATISTICS Probability	GEOMETRY Measures		REVISION							GEOMETRY Area, Perimeter & Volume

Shared resources

We have an active maths area on SharePoint where our teachers share resources and work collaboratively.

Subscriptions

- White Rose Maths
- Dr Frost Maths

All our School make use of the wealth of free maths resources that are available such as:

- Corbett Maths
- Maths Bot
- Mymaths
- NRich
- Pixi Maths
- Mr Barton Maths
- Maths White Board
- Starting Points Maths
- NCTEM

Assessment in maths

Please also refer to the Trust Assessment Policy

Primary:

White Rose termly assessments are used to track and evaluate pupil progress along with formative assessment opportunities in every lesson.

Secondary:

At Wave we have a dynamic and comprehensive approach to assessment that fosters a deep understanding of mathematical concepts, promotes student growth and addresses gaps in students understanding. Our assessment strategies are designed to provide meaningful insights into students' progress while encouraging a positive and collaborative learning environment.

We use a range of assessment tools to check and monitor students' progress and understanding; from base line tests, diagnostic questioning, low stakes quizzes, end of topic assessments and mock exams. We strive to evaluate not only knowledge but also critical thinking, problem-solving skills, and application of mathematical concepts in real-world scenarios.

Our assessments are aligned with our curriculum, ensuring that each evaluation is purposeful and directly contributes to the development of key mathematical skills. This targeted approach allows us to track progress on a granular level and tailor instruction to meet individual student needs.

Real-time feedback is crucial for student success. We incorporate formative assessment strategies into our daily lessons, enabling teachers to gauge understanding, identify misconceptions, and adapt their teaching strategies promptly. This process ensures that students receive the support they need when they need it most.

Maths at River Dart Academy

KS3 Mathematics

At KS3 we use White Rose Maths which is an award-winning system for teaching and learning mathematics to young learners. White Rose Maths resources are used by pupils, parents, carers, teachers and practitioners across the UK and beyond. It provides a comprehensive programme of learning that is suitable for all children regardless of age, gender, background, abilities or prior knowledge.

"Our aim is for young mathematicians to become:

- Confident and able to recall and apply mathematical knowledge in different contexts
- Able to explain their methods and thinking processes and apply skills in context
- Fluent in different areas of maths
- Efficient in applying problem-solving and reasoning skills
- Independent thinkers
- Making number work fun Maths
- Aware of the Maths/ concepts/ process they are doing"



We also aim for there to be a smooth transition into GCSE where students are able link with prior learning.

Recognise the place value of any number in an integer up to one billion.

1. What numbers are represented on the place-value chart?

100,000,000	10,000,000	1,000,000	100,000	10,000	1,000	100	10	1	0.1	0.01	0.001

2. Write the number represented on the place-value chart.

100,000,000	10,000,000	1,000,000	100,000	10,000	1,000	100	10	1	0.1	0.01	0.001

3. What number is represented on each place-value chart?

100,000,000	10,000,000	1,000,000	100,000	10,000	1,000	100	10	1	0.1	0.01	0.001

Fri 6 Nov **NOVEMBER** 2020

1. I have £2.

I have 4 times as much.

How much do they have in total?

Alex: £2

Dora: ?

2. Sonia is 15 years old. She has an older sister. The sum of Sonia and her sister's ages are 36. How much younger than her sister is Sonia?

Sonia: 15

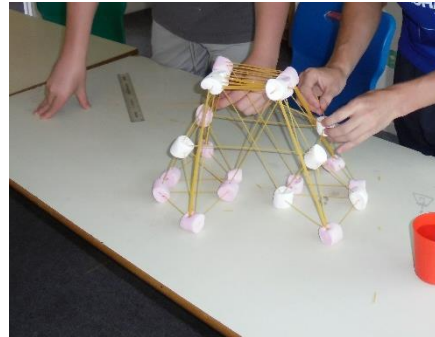
Sister: ?

Total: 36

GCSE Mathematics

Subject content

- 1 Number
- 2 Algebra
- 3 Ratio, proportion and rates of change
- 4 Geometry and measures
- 5 Probability
- 6 Statistics



Assessments

GCSE Mathematics has a Foundation tier (grades 1 – 5) and a Higher tier (grades 4 – 9). Students must take three question papers at the same tier in the Summer of year 11.

Aims and learning outcomes

The course should encourage students to develop confidence in, and a positive attitude towards, mathematics and to recognise the importance of mathematics in their own lives and to society. It should also provide a strong mathematical foundation for students who go on to study mathematics at a higher level post-16.



The AQA GCSE course in mathematics should enable students to:

1. develop fluent knowledge, skills and understanding of mathematical methods and concepts
2. acquire, select and apply mathematical techniques to solve problems
3. reason mathematically, make deductions and inferences and draw conclusions
4. comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

Students should also be able to recall, select and apply mathematical formulae.



Assessment objectives

Assessment objectives (AOs) are set by Ofqual and are the same across all GCSE Mathematics specifications and all exam boards.

The exams will assess the following AOs in the context of the content set out in the Subject content section.

- AO1: Use and apply standard techniques.

Students should be able to:

- accurately recall facts, terminology, and definitions
- use and interpret notation correctly.
- accurately carry out routine procedures or set tasks requiring multi-step solutions.

- AO2: Reason, interpret and communicate mathematically.

Students should be able to:

- make deductions, inferences and draw conclusions from mathematical information.
- construct chains of reasoning to achieve a given result

- interpret and communicate information accurately.
 - present arguments and proofs
 - assess the validity of an argument and critically evaluate a given way of presenting information.
- AO3: Solve problems within mathematics and in other contexts.

Students should be able to:

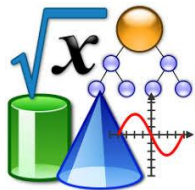
- translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes.
- make and use connections between different parts of mathematics.
- interpret results in the context of the given problem.
- evaluate methods used and results obtained.
- evaluate solutions to identify how they may have been affected by assumptions made.

Functional Skills Mathematics

Maths is for everyone. It is diverse, engaging and essential in equipping learners with the right skills to reach their future destination, whatever that may be. AQA's Functional Skills qualifications allow teachers and learners to explore real life contexts together. Everyday mathematics forms the basis of our practical and engaging specification, giving teachers the freedom to shape what success looks like for every learner.

Subject content

1. Use of number and the number system
2. Use of measures, shape and space
3. Handling information and data



<p>Median Median is the middle value when data is placed in ascending order.</p> <p>Mean Mean is the same as average. Mean = sum of all values / no. of values</p> <p>TOP Tip: Always rearrange the data in ascending order. Use an acronym to help you remember definitions, e.g. mean is average, median mid, mode most, range difference between the highest and lowest values.</p> <p>Charts & graphs remember: Chart title Axis labels Correct scale starting at zero</p> <p>Weather in January</p>	<p>Mode Mode is the value that occurs the most. 10 10 32 41 75</p> <p>Range Range is the difference between the highest and lowest values.</p>	<p>Functional Skills Mathematics Level 1 & 2 Revision</p> <p>Scale Plans and maps use scales. The scale of a plan tells you the relationship between lengths on the plan and actual distances/measurements in real life.</p> <p>Example On the plan below the scale is 1cm = 2m. This means that each cm on the map represents 2 metres in actual real life distance.</p> <p>Therefore you can calculate the actual measurement of e.g. the living room: Width on plan = 3cm Actual width = 3 x 2 = 6m Length on plan = 2cm Actual length = 2 x 2 = 4m</p> <p>Tables Remember the question will lead you to the information you need to put into your table. Remember a title and suitable column headings.</p>	<p>Perimeter The perimeter of a shape is the distance all the way round it.</p> <p>$8+12+12+8 = 40m$</p> <p>Area To calculate the area of a rectangle we use the formula: Area = L x W</p> <p>Example To calculate the area of a shape when its sides = 9cm Area = 9 x 9 = 81cm² To calculate the area of an irregular shape 1) break the shape into smaller shapes. 2) calculate the area of each shape 3) add together.</p> <p>Example: 4 x 5 = 20cm² 5 x 3 = 15cm² 20cm² + 15cm² = 35cm²</p> <p>Probability is the study of how likely something is to happen. Example: a probability line is often used on a scale of 0 to 1</p> <p>Impossible (0) Will be written as a fraction, decimal or percentage using this formula: Probability = Number of ways it can happen / Total number of outcomes</p> <p>Certain (1)</p>
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Assessments

AQA Level 1 and 2 Functional Skills in Mathematics are linear. Learners must sit both papers in the same series. For both levels, 25% of the total marks are allocated to the assessment of underpinning skills and 75% of the total marks are allocated to the assessment of problem solving.

