

Woodlands School

CURRICULUM



#togetherwegrow

Marches Academy Trust 

Maths

Our vision



Throughout their Mathematical journey students at Woodlands School learn how to demonstrate their ability in numerous areas as we guide students towards achieving or exceeding their potential. With ever-increasing emphasis being placed on the mathematical content of 'real-life' and functional situations, we endeavour to, where appropriate, use practical and investigative approaches. Students will also have opportunities to communicate their understanding to other students and to use ICT to enhance and improve their own learning and performance.

The Big Picture

Mathematics is a challenging transition to the study of secondary Mathematics. The pupils will experience “mastery” alongside more traditional teaching methods to gain a deeper understanding, more confidence and competence in their mathematics

Intent: Mathematics continues to revisit topics within new contexts whilst extending and further developing mathematical thinking and skills.

‘Learning Programme’ blocks to be covered: Number, algebra, geometry, formulas, statistics and statistical measures, ratio and proportion. Each term is split into three ‘bigger picture’ questions with a common theme, each half is split into further blocks that ensure students spend enough time to get a deep understanding of the topic covered. Blocks have been designed with interleaving as a key element enabling students to revisit previous work, develop knowledge and understanding and further extend their skills. Number work is emphasized throughout the blocks. Calculator skills have been incorporated throughout the curriculum, thus enabling all students to access the materials presented. Any student will be able to follow the main content of all lessons with differentiation and higher levels being accessed as and when a class/student requires it.

Implementation:

There will be ten units of learning. Each unit will cover different big questions that are explored throughout every subject area. Independence and study skills will be fostered through challenging questions, group and pair work, modelling, and independent study also understanding and interoperating worded questions. Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem-solving methods for just one question. Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers. WOW moments will occur when students solve complex problems, when the barrier wall disappears, and they have a moment of satisfying clarity (no matter how brief) or spotting a relationship that was previously unseen. Numeracy skills will be addressed through dedicated numeracy lessons using my maths and times table rock stars. Numeracy independent learning, looking at mathematical language and key words, which is done throughout all topics. Calculator skills will also be embedded.

Key assessments:

Assessments, informal, at the end of each unit of study to consolidate learning.

Autumn Term
Assessments with questions covering topics for the term

Spring Term
Assessments with questions covering topics for the term

Summer Term
Assessments with questions covering topics for the term

Impact:

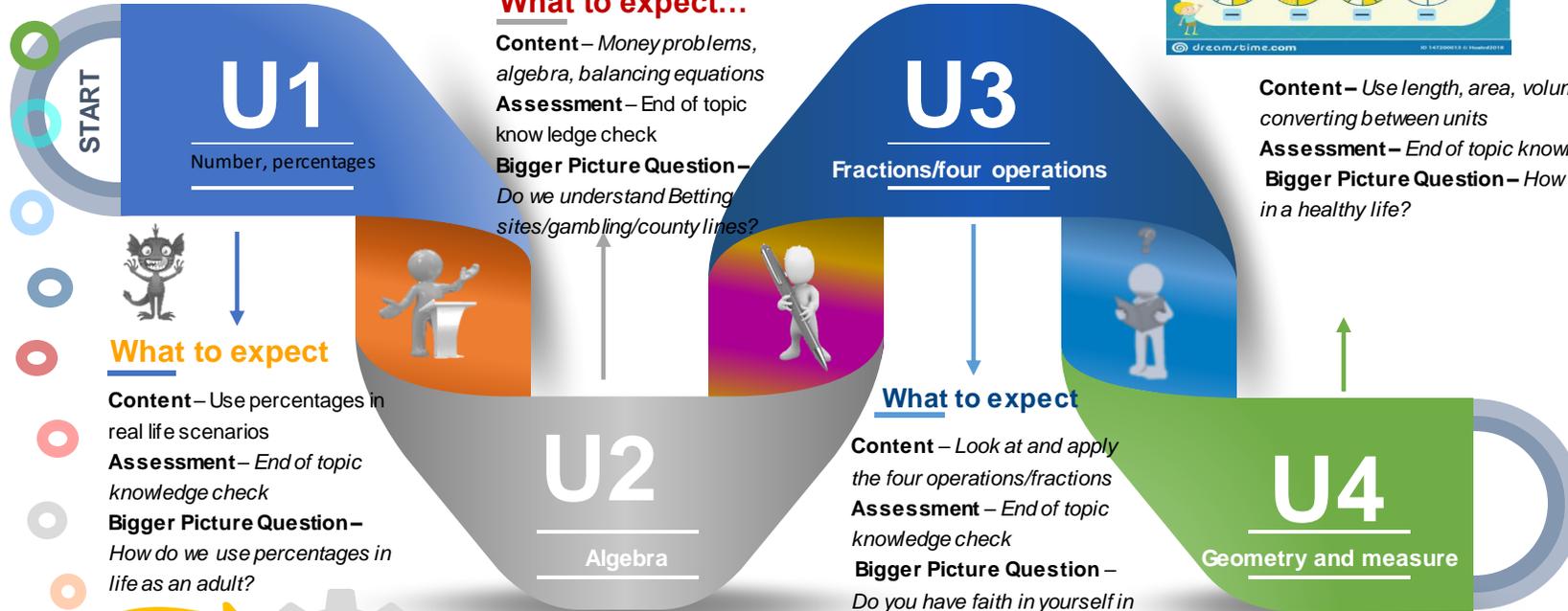
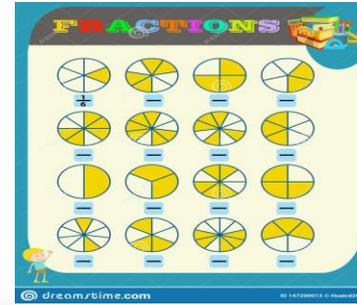
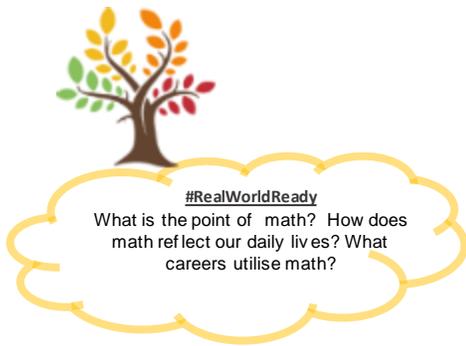
Pupils will have increased understanding and confidence in Maths and be able to apply new skills to a variety of new and challenging mathematical problems. Pupils will know more and remember more. There will be an increase in attainment and attend more lessons. This is evidenced in regular formal and informal assessments

Middle School/Saplings Maths Overview

What is my Learning Journey?



Marches Academy Trust



#RealWorldReady
What is the point of math? How does math reflect our daily lives? What careers utilise math?

What to expect...

Content – Money problems, algebra, balancing equations

Assessment – End of topic knowledge check

Bigger Picture Question – Do we understand Betting sites/gambling/county lines?

U3

Fractions/four operations

Content – Use length, area, volume and mass, converting between units

Assessment – End of topic knowledge check

Bigger Picture Question – How do we use math in a healthy life?

START

U1

Number, percentages



What to expect

Content – Use percentages in real life scenarios

Assessment – End of topic knowledge check

Bigger Picture Question – How do we use percentages in life as an adult?

U2

Algebra

What to expect

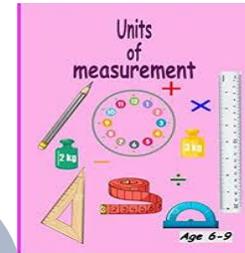
Content – Look at and apply the four operations/fractions

Assessment – End of topic knowledge check

Bigger Picture Question – Do you have faith in yourself in math?

U4

Geometry and measure



Stretch & Challenge

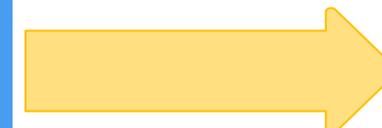
Practice times tables 10 minutes a day

Times Tables

1	2	3	4	5	6	7	8	9	10	11	12	
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Multiplication Chart

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144



Middle School/Saplings Maths Overview

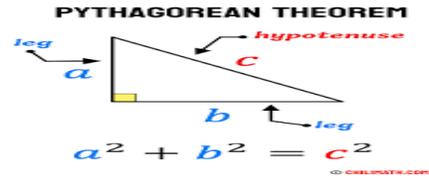
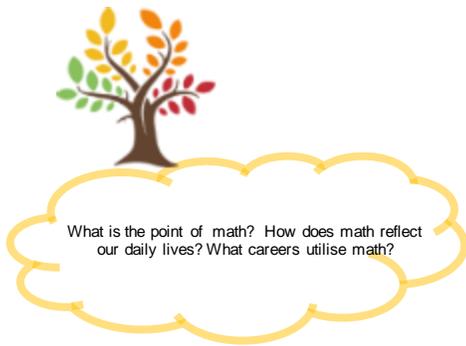
What is my Learning Journey



Marches Academy Trust



Maths is everywhere



START

U5

Geometry

What to expect...

Content – Know the unique formula for Pythagoras' Theorem

Assessment – End of topic knowledge check.

Bigger Picture Question – Am I unique?

U7

Laws of Indices

What to expect

Content – Interpret charts, graphs and construct them, use frequency tables/bar charts/pie charts and pictograms.

Assessment – End of topic knowledge check

Bigger Picture Question – Will life be different in the future, can math effect this?

What to expect

Content – Identify, Describe and construct congruent and similar shapes. Considering rotation, reflection, translation.

Assessment – End of topic knowledge check.

Bigger Picture Question – How can we love math?

U6

Pythagoras' Theorem

What to expect

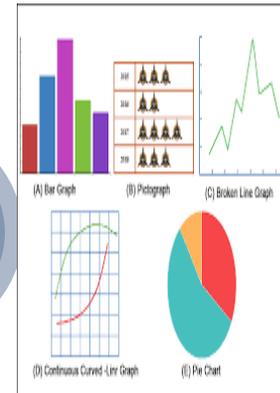
Content – Use positive integer powers and associated real roots

Assessment – End of topic knowledge check

Bigger Picture Question – What would make a perfect world? Do we need laws?

U8

Statistics



Stretch & Challenge

Challenge yourself on Times Table Rockstars, on your own or with a team.

Laws of Indices

$$x^a \times x^b = x^{a+b}$$

$$x^a \div x^b = x^{a-b}$$



Middle School/Saplings Maths Overview

What is my Learning Journey?



Marches Academy Trust



MATHS FOR LIFE



#RealWorldReady

What is the point of math? How does math reflect our daily lives? What careers utilise math?

Mode The mode is the value that appears most often in a set of data.

Range The range is the difference between the lowest value and the highest value.

Median The median is the middle number in a list of numbers ordered from lowest to highest.

Mean The mean is the total of all the values, divided by the number of values.

Statistics

$\sigma = \frac{1}{n} \sqrt{\sum (x_i - \bar{x})^2}$ $s^2 = \frac{1}{n-1} \sum (x_i - \bar{x})^2$ $\sigma = \sqrt{\frac{\sum x_i^2}{n} - \bar{x}^2}$ $s = \sqrt{\frac{\sum x_i^2}{n-1} - \bar{x}^2}$

$\bar{x} = \frac{\sum x_i}{n}$ $\sigma = \sqrt{\frac{\sum x_i^2}{n} - \bar{x}^2}$ $s = \sqrt{\frac{\sum x_i^2}{n-1} - \bar{x}^2}$

$\hat{y} = a + bx$ $\mu = np$ $\sigma = \sqrt{np(1-p)}$ $\mu = \frac{1}{2} \pm 2t$

$b = r \frac{s_y}{s_x}$ $a = \bar{y} - b\bar{x}$ $\hat{p} = \frac{a + bx}{1 + e^{-a - bx}}$ $\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n}$

$\binom{n}{r} = \frac{n!}{r!(n-r)!}$ $SE = \sqrt{\frac{p(1-p)}{n}}$ $\sigma = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$

$P(A|B) = \frac{P(A \cap B)}{P(B)}$ $P(B|A) = \frac{P(A \cap B)}{P(A)}$ $P = 1 - P(A)$ $CI = (\bar{x} - 2s, \bar{x} + 2s)$ $S = \frac{1}{n-2} \sum (y_i - \hat{y}_i)^2$



What to expect

- Oak Courses:
- Functional Skills Level 1
 - Functional Skills Level 2
 - GCSE Foundation Maths



START

U9

Statistical Measures

Content – Apply ratio to real life contexts and problems

Assessment – End of topic knowledge check

Bigger Picture Question – How can math help you succeed in life?



What to expect

Content – Interpret, Annalise and compare data (mode, median, range and mean)

Assessment – End of topic knowledge check

Bigger Picture Question – Will life be different in the future, can math effect this?



U10

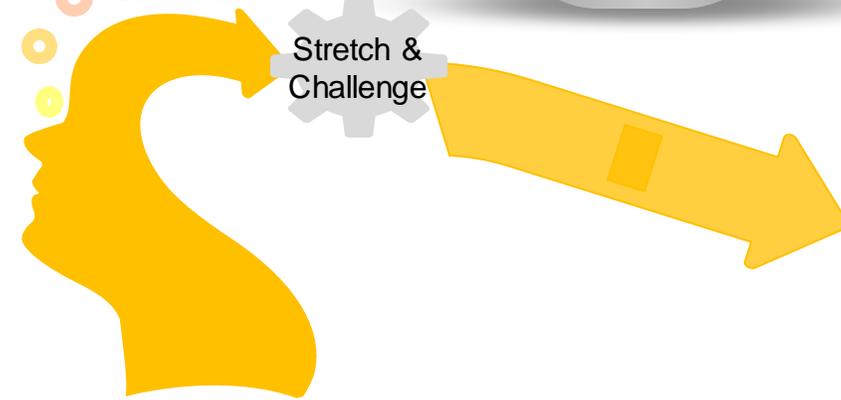
Ratio and Proportion

Upper School

On to Oaks

RATIOS compare VALUES

PROPORTIONS compare RATIOS



MyMaths.co.uk



The Big Picture

Y10/11 Mathematics is designed to maximise progression and allow flexibility. Each topic presents opportunities to recap on previously covered content whilst also giving students the chance to extend themselves on the journey to achieving their full potential.

Intent:

Students will have increased understanding and confidence in maths and be able to apply new skills to a variety of new and challenging mathematical problems. Students will know more and remember more. Students will have developed their skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular knowledge checks. Students leave Y11 ready for the real world and in a position to continue studying maths if they wish..

There will be ten units of learning. Each unit will cover different big questions that are explored throughout every subject area. Independence and study skills will be fostered through challenging questions and problems, group and pair work, modelling, knowledge checks after each unit and past paper assessment. Lessons will be based around multiple representations; Concrete, Pictorial, Abstract to give a deeper understanding of concepts. Reasoning will be developed through the exploration of mathematical patterns and images with a variety of problem solving methods for just one question. Formal structure to answering GCSE questions will be embedded. Learning to move forward and uncover mathematical ideas from mistakes and misconceptions via true/false, spot the mistake and other reasoning tasks where students are required to make a judgement and justify their answers. Revision organisers will be provided to enable students to recall keywords, facts, formulas and/or formal methods. WOW moments will occur when students solve complex problems, when the barrier wall disappears and they have a moment of satisfying clarity (no matter how brief) or spotting a relationship that was previously unseen. Numeracy and calculator skills will be embedded.

Key assessments:

Students will take mock exams and complete end of unit exam style questions.

Autumn Term
Assessments with questions covering topics for the term
Functional Skills level 1 and 2

Spring Term
Assessments with questions covering topics for the term
Revision.

Summer Term
GCSE AQA Maths Exam

Impact

Pupils will have increased understanding and confidence in maths and be able to apply new skills to a variety of new and challenging mathematical problems. Pupils will know more and remember more. Pupils will have developed skills enabling them to manipulate familiar and unfamiliar vocabulary and deduce mathematical content. They will be familiar with a variety of exam questions and be suitably prepared to answer examination style questions. There will be an increase in attainment, evidenced in regular, formal and informal assessments.



#RealWorldReady
What is the point of math? How does math reflect our daily lives? What careers utilise math?

Upper School/Oak Maths Overview

What is my Learning Journey?



Marches Academy Trust



Percentages & Fractions

Percentage Formulae

Percentage Problems

Percentage of an Amount

Percentage Change

Percentage Increase

Percentage Decrease

Percentage Error

Percentage of a Total

Percentage of a Part

Percentage of a Whole

Percentage of a Fraction

Percentage of a Decimal

Percentage of a Integer

Percentage of a Rational

Percentage of an Irrational

Percentage of a Complex

Percentage of a Real

Percentage of a Complex Plane

Percentage of a Vector Space

Percentage of a Metric Space

Percentage of a Topological Space

Percentage of a Group

Percentage of a Ring

Percentage of a Field

Percentage of a Division Ring

Percentage of a Commutative Ring

Percentage of a Non-Commutative Ring

Percentage of a Division Ring

Percentage of a Commutative Ring

Percentage of a Non-Commutative Ring

Algebra – Algebraic fractions

Addition and Subtraction

Multiplication and Division

Factorise expressions

Cancel common factors

Reciprocals

Complex fractions

Partial fractions

Algebraic manipulation

Algebraic identities

Algebraic equations

Algebraic inequalities

Algebraic functions

Algebraic graphs

Algebraic curves

Algebraic surfaces

Algebraic volumes

Algebraic masses

Algebraic lengths

Algebraic areas

Algebraic perimeters

Algebraic angles

Algebraic arcs

Algebraic circles

Algebraic spheres

Algebraic cylinders

Algebraic cones

Algebraic pyramids

Algebraic prisms

Algebraic boxes

Algebraic cubes

Algebraic spheres

Algebraic cylinders

Algebraic cones

Algebraic pyramids

Algebraic prisms

Algebraic boxes

Algebraic cubes

START

U1

Number, percentages

What to expect

Content – Use percentages in real life scenarios

Assessment – End of topic knowledge check/GCSE questions

Bigger Picture Question – How do we use percentages in life as an adult?

U2

Algebra

Stretch & Challenge

Practise for Functional Skills exams

What to expect...

Content – Money problems, algebra, balancing equations

Assessment – End of topic knowledge check

Bigger Picture Question – Do we understand Betting sites/gambling/county lines?

U3

Fractions/four operations

What to expect

Content – Look at and apply the four operations/fractions, positive/negative, proper and improper.

Assessment – End of topic assessment/past GCSE questions

Bigger Picture Question – Do you have faith in yourself in math?

U4

Geometry and measure

What to expect

Content – Use length, area, volume and mass, converting between units

Assessment – End of topic assessment/past GCSE questions.

Bigger Picture Question – How do we use math in a healthy life?

Area of a triangle

Area of a trapezium

Area of a circle

Circumference of a circle

Area of a sector

Area of a segment

Volume of a prism

Volume of a cylinder

Volume of a cone

Volume of a pyramid

Volume of a sphere

Surface area of a cube

Surface area of a cylinder

Surface area of a cone

Surface area of a sphere

GCSE Maths Formulas

Area of a rectangle

Area of a triangle

Area of a parallelogram

Area of a trapezium

Circumference of a circle

Area of a circle

Volume of a prism

Volume of a cylinder

Volume of a cone

Volume of a pyramid

Volume of a sphere

Surface area of a cube

Surface area of a cylinder

Surface area of a cone

Surface area of a sphere

CGP Functional Skills Maths Level 1 Study & Test Practice

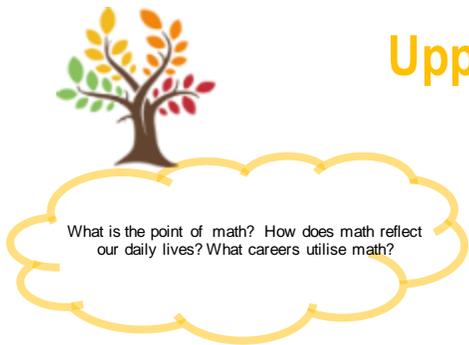
CGP Functional Skills Maths Level 2 Study & Test Practice

Pearson Edexcel Functional Skills ***Past Paper 1*** Mathematics Level 2 Section A (Non-Calculator)



Upper School/Oak Maths Overview

What is my Learning Journey?



PYTHAGOREAN THEOREM

$a^2 + b^2 = c^2$

ALGEBRAIC FRACTIONS

Learning Objective: Simplify algebraic fractions through factoring. Simplify each of these fractions.

$\frac{15x^2+10x}{x^2-25}$	$\frac{10x^2+5x^2}{3x}$
$\frac{2x^2+8x}{x^2-4}$	$\frac{2x^2}{x^2+3x+2}$
$\frac{3x^2-1}{x^2-2x+1}$	$\frac{x^2-4}{x^2-4}$
$\frac{x^2-2x+1}{x^2-2x+1}$	$\frac{x^2-4}{x^2-4}$
$\frac{x^2-2x+1}{x^2-2x+1}$	$\frac{x^2-4}{x^2-4}$

Calculations with Standard Form (without calculator)

Multiply	Divide
$(4 \times 10^2) \times (2 \times 10^3)$ $= 8 \times 10^5$	$(4 \times 10^3) \div (2 \times 10^2)$ $= 2 \times 10^1$
$(3 \times 10^4) \times (2 \times 10^{-2})$ $= 6 \times 10^2$	$(4.8 \times 10^2) \div (1.2 \times 10^3)$ $= 4 \times 10^{-1}$
$(4 \times 10^2) \times (3 \times 10^3)$ $= 12 \times 10^5$ $= 1.2 \times 10^6$	$(1 \times 10^6) \div (2 \times 10^3)$
$(5 \times 10^3) \times (7 \times 10^3)$	$(1 \times 10^7) \div (4 \times 10^5)$



Maths is everywhere

START

U5

Geometry/Revision

What to expect...

Content – Know the unique formula for Pythagoras' Theorem

Assessment – End of topic knowledge check.

Bigger Picture Question – Am I unique?

U7

Laws of Indices/Revision

What to expect

Content – Interpret charts, graphs and construct them, use frequency tables/bar charts/pie charts and pictograms.

Assessment – End of topic knowledge check

Bigger Picture Question – Will life be different in the future, can math effect this?

What to expect

Content – Identify, Describe and construct congruent and similar shapes. Considering rotation, reflection, translation.

Assessment – End of topic knowledge check.

Bigger Picture Question – How can we love math?

U6

Pythagoras' Theorem/Revision

What to expect

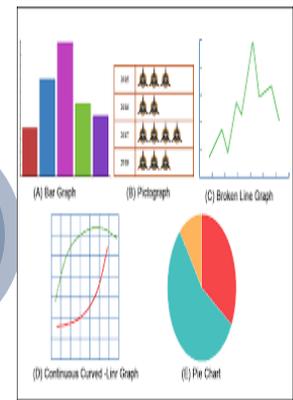
Content – Use positive integer powers and associated real roots/standard form.

Assessment – End of topic knowledge check

Bigger Picture Question – What would make a perfect world? Do we need laws?

U8

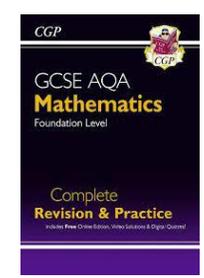
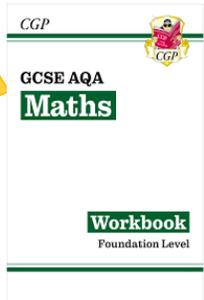
Statistics/Revision year 11 lead



Laws of Indices

$$x^a \times x^b = x^{a+b}$$

$$x^a \div x^b = x^{a-b}$$



Upper School/Oak Maths Overview

What is my Learning Journey?



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Range The range is the difference between the lowest value and the highest value.

Median The median is the middle number in a list of numbers ordered from lowest to highest.

Mean The mean is the total of all the values, divided by the number of values.

RATIOS compare VALUES

PROPORTIONS compare RATIOS



START

U9

Statistical Measures

Content – Apply ratio to real life contexts and problems

Assessment – End of topic assessment

Bigger Picture Question – How can math help you succeed in life?



What to expect

Content – Interpret, Analyse and compare data (mode, median, range and mean) primary and secondary data.

Assessment – End of topic assessment

Bigger Picture Question – Will life be different in the future, can math effect this?



U10

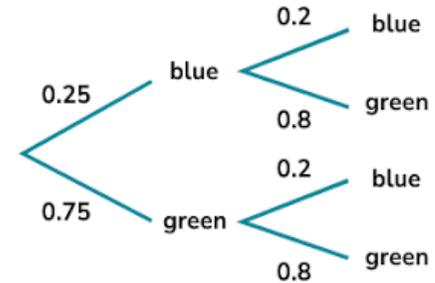
Ratio and Proportion



Statistics



Move to year 11/Exams



Stretch & Challenge

practice exam style questions



All things Angles worked exam questions

PORES is a quadrilateral. NOT a straight line.

Work out the size of angle x .

Answer degrees (2 marks)



Here is some information about the distances 300 people travel to work.

Distance, d (miles)	Frequency
$0 < d < 5$	70
$5 < d < 10$	98
$10 < d < 25$	84
$25 < d < 60$	48
Total = 300	

Estimate the number of people who travel more than 15 miles to work.

A	B	C	D
76	90	104	196