Maths KS3

COWES ENTERPRISE COLLEGE
AN ORMISTON ACADEMY
Educate for life

KEY Number · Measure · Geometry · Algebra · Probability · Statistics · Ratio and Proportion · Eco Futures

YR7

Y7 UNIT 1

NP1 - Place value

How does the base 10 system work?

What is an integer?

When does multiplication make a number smaller and division make it bigger?

Y7 UNIT 2

NP1 – Directed number

How do vectors show positive and negative numbers on a number line?

Eco Futures: Can I use vectors to help me calculate with directed number?

Change in temperature, money/debt questions

Y7 UNIT 3

NP1- Rounding

How do I round to decimal places and significant figures?

Eco Futures: Can I round to a specific decimal place and/or significant figure using EcoFutures data?

(Fuel usage, waste, deforestation)

Y7 UNIT 4

NP1 - Statistics

How do I find the median of a set of numbers

Eco Futures: Can I find the median from specific EcoFutures data?

(Fuel usage, waste, deforestation)

Y7 UNIT 5

NP1– Metric Conversion

How do I convert between different metric units?

Eco Futures:
Can I convert between metric units?
Waste weight – tons-kg-grams
Length – km – m-cm-mm

Y7 UNIT 6

NP2 – Addition and subtraction

How can I select the best strategies for addition and subtraction?

What is a complement?

What is a zero pair?

Y7 UNIT 7

NP2 – Geometry (Addition and subtraction)

How do I find the perimeter of a shape?

How do I find a missing angle on a straight line or around a point?

Y7 UNIT 8

NP2 – Statistics (Mean)

How do I calculate the mean of a set of numbers?

Eco Futures: Can I calculate the mean from EcoFutures data?

Mean from a list of numbers – de/re forestation rates, car production – petrol/diesel/electric?

Rainfall levels

Y7 UNIT 9

NP3 – Multiplication and division

How can I select the best strategies to multiply and divide?

What is a highest common factor?

What is a lowest common multiple?

What is meant by equality?

Can I use the application of multiplication and division in area and volume problems?

Y7 UNIT 10

NP4 – Powers and roots

How do I write an integer as a product of its prime factors?

What are exponents and roots?

What are prime and composite numbers?

Why is index notation useful?

Eco Futures: Can I use index notation?

Use index notation for amount of waste produced by schools, countries?

Can I use index notation for fuel usage or power produced by renewable energy?

Y7 UNIT 11

NP5 – Order of operations

How do I correctly do the order of operations with the four operators?

How do I correctly do the order of operations that include brackets and exponents?

Y7 UNIT 12

NP6 – Directed Number

How do I add and subtract with directed numbers?

How do I multiply and divide with directed numbers?

Where do we use negative numbers outside the classroom?

Eco Futures: Can I add and subtract with directed numbers?

Can I use the 4 operations with EcoFutures data?

Change in temperature/rainfall/land use (buildings or reforestation).

Y7 UNIT 13

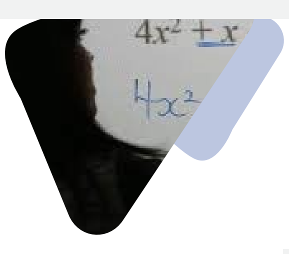
A1 – Introduction to algebra

How do I simplify an expression?

How do I substitute numbers into an expression?

What is a variable?

What is an expression?



Y7 UNIT 14

NP7- Fractions

How do I find fraction of amounts?

What is a sneaky one?

How do I add and subtract fractions?

How do I multiply fractions?

What is the reciprocal and how does it relate to dividing by a fraction?

Eco Futures: Can I use fractions to find fraction of land used for farming? Arable, Livestock.

Can I find the fraction of the food waste that restaurants, supermarkets waste every day?

Y7 UNIT 15

NP8 – FDP equivalence

Can I find a percentage using a decimal multiplier?

How can I convert a fraction to a decimal?

What does the word percentage mean?

What is a terminating decimal?

Eco Futures: Can I use percentages to find the percentage of new cars that are, petrol, diesel, hybrid or electric?

Y7 UNIT 16

A2 - Manipulating and simplifying expressions

Can I set up an algebraic expression?

Can I simplify indices and coefficients when multiplying and dividing terms?

Can I tell the difference between an expression and an equation?

YR8

Y8 UNIT 1

NP8 - FDP equivalence

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How can I convert a fraction to a decimal?

What does the word percentage mean?

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Eco Futures: Can I use percentages to find the percentage of new cars that are, petrol, diesel, hybrid or electric?

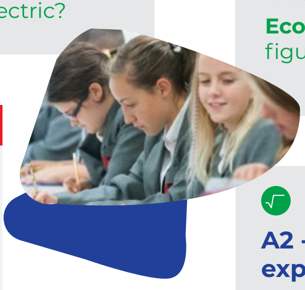
Y8 UNIT 2

NP9 - Estimation and use of a scientific calculator

Can I convert between units of time using a calculator?

Can I calculate an upper or lower bound given a degree of accuracy

Eco Futures: Can I round to significant figures?



Y8 UNIT 3

A2 - Manipulating and simplifying expressions

Can I set up an algebraic expression?

Can I simplify indices and coefficients when multiplying and dividing terms?

Can I tell the difference between an expression and an equation?

Y8 UNIT 5

GM1 - Drawing and measuring angles; construction

How can I label lines and angles?

Which scale do I use on a protractor?

Can I construct a perpendicular bisector?

Can I construct simple 'Loci' based on specific rules?

Eco Futures: Can I draw loci on maps in different environmentally threatened regions of the world?

Y8 UNIT 6

A3 - Expanding and Factorising

Can I expand single and double brackets?

Describe why factorise is the opposite of expand?

Y8 UNIT 7

A4 - Linear Equations

How does the 'balancing method' solve equations?

How do I solve one and two-step equations?

Y8 UNIT 8

NP10 - Proportional reasoning

What is the difference between direct and inverse proportion?

How can I use a decimal multiplier to calculate a percentage change?

Y8 UNIT 9

GM2 - Polygons and Angles

How many line angle facts are there?

How can I find the exterior and interior angles of polygons?

Can I find a bearing using angle rules?

Y8 UNIT 10

SP1 - Discrete Data and Continuous Data

Can I describe the difference between discrete and continuous?

How can I distinguish between mean, median, mode and range?

Eco Futures: Which foods have the highest carbon and lowest footprint?

Y8 UNIT 11

NP11 - Ratio

Can I express relationships as ratios?

Can I simplify ratios including those that include fractions and scaling upto fractions?

Can I use unit ratio in context such as maps and scale drawing?

Can I convert between fractions and ratios and between ratios and fractions?

Can I find the value of parts of a ratio given other parts or the whole?

Y8 UNIT 12

A5 - Formulae

Can I evaluate expressions and formulae by substitution, including inputs and outputs?

Can I write formulae in words and letters, including SDT/DMV/PFA?

Can I generate sequences from formulae?

Can I rearrange linear formulae?

Y8 UNIT 13

SP2 - Bivariate data & Time Series

Can I write the data handling cycle, using data to address a hypothesis, overview of the types of data and ask good questions?

Do I know the difference between categorical (qualitative) data and frequency tables?

Can I draw graphical representations of discrete numerical data - vertical line, bar charts, pie charts, pictograms?

Can I use measures of central tendency of ungrouped data - mean, mode and median, from lists and from a frequency table?

Can I use the measures of spread - range, interquartile range and identify outliers?

Can I compare data sets through graphs, central tendency and spread?

Y8 UNIT 14

A6 - Cartesian Grid

Can I draw an accurate Cartesian grid and plot 2D coordinates in four quadrants?

Can I express number relationships graphically, as a means of picturing the relationship?

Can I plot quadratic number relationships on a Cartesian grid given the algebraic form of the relationship?

Can I read values of variables from a graph (including quadratic, piecewise linear, exponential and reciprocal graphs)?

Can I draw and recognise graphs of y=n and x=n?

Can I use the gradient and y-intercept of a line to write the equation in the form y = mx+c;?

Can I identify parallel lines from their equations?

YR9

Y9 UNIT 1

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Y9 UNIT 2

A5 - Formulae

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Can I generate sequences from formulae?

Can I rearrange linear formulae?

Y9 UNIT 3

GM3 - Area

Can I define area?

Can I find the area of triangles?

Can I find the area of quadrilaterals including kite, parallelogram and trapezium?

Can I find the area of a circle?

Y9 UNIT 5

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Y9 UNIT 7

A7 – Introduction to Sequences

Can I generate terms of a sequence from term-to-term and position to term rules; find missing terms in a sequence?

Can I find and use the nth term of an arithmetic (linear) sequence?

Can I recognise common sequences (triangular numbers, square numbers, cube numbers, Fibonacci-style sequences)?

Can I work with visual and algebraic representations of arithmetic sequences?

Y9 UNIT 8

NP12 – Standard form

Can I convert large and small numbers in standard form?

Can I convert from 'almost standard' form to standard form?

Can I compare numbers in standard form (and "almost standard" form)?

Can I add and subtract in standard form, by converting to normal form and by using distributivity?

Can I multiply and divide in standard form (using commutativity)?

Y9 UNIT 9

A8 – Linear Inequalities

Can I represent single (e.g. x>3) and double (e.g. 3<x<5) linear inequalities on a number line?

Can I solve single linear inequalities in one variable, represent the solution(s) on a number line and algebraically using set notation?

Can I solve compound linear inequalities in one variable, representing the solution(s) on a number line?

Can I set up inequalities from contexts?

Can I represent inequalities involving only x or y by shading on a graph?

Y9 UNIT 10

A9 – Contextual graphs

Can identify important sections of general "real-life" graphs, interpreting y-intercepts as a fixed value/charge, etc, and gradient as a rate of change in context?

Can I draw and read from and extrapolating from conversion graphs?

Can I use distance-time graphs, including finding the average speed, and the speed of a section as the gradient of the line?

Can I use Velocity-time graphs, including finding the acceleration as the gradient and displacement as the area under the graph?

Y9 UNIT 11

SP3 - Introduction to Probability

Can I systematically list and use the product rule for counting?

Can I record, describe and analyse the frequency of outcomes of simple probability experiments?

Can I formalise language and notation, calculating theoretical probability?

Can I generate theoretical sample spaces, including systematic listing of combinations and outcomes, and use these to calculate probabilities?

Can I record outcomes and possibilities using frequency trees, two-way tables and simple Venn diagrams?

Y9 UNIT 12

GM4 – Congruence and Similarity

Can I describe the difference between congruence and similarity?

Can I apply the four transformations to shapes and objects?

Can I identify the scale factor in similar shapes and enlargements?

Can I prove the conditions for congruent triangles?

Y9 UNIT 13

GM5 – Right Angled Triangles

Can I use Pythagoras Theorem to find missing sides on a right angled triangle?

Can I find the distance between two points using Pythagoras Theorem?

Can I find missing sides and angles in right angled triangles using the trigonometric ratios?

Can I recall the exact values for the trigonometric ratios for angles 0, 30, 45, 60 and 90 degrees?

Y9 UNIT 14

GM6 - Circles

Can I recall the correct terms for the parts of a circle?

Can I find the circumference of circles and compound shapes?

Can I find the area of circles and compound shapes?

Can I find the length of an arc?

Can I find the area of a sector?

Can I recall and use all the circle theorems to find missing angles?

Y9 UNIT 15

NP13 – Advanced Proportion and Rates of Change

Can I find the original amount after a percentage change?

Can I calculate simple interest?

Can I work out problems involving direct and inverse proportion?

Can I calculate compound measures such as density, pressure and speed?

Can I solve complex ratio problems including - combining ratios, finding parts, differences and wholes etc?

KS5