



Year 9 Scheme of Learning

MODULE 1



Bishop Chadwick
Catholic Education Trust



GCSE EXAMS

Bespoke revision

Perimeter, area & volume

Bounce back: Constructions & Loci

Quadratic equations

Compound measures

Percentages, including interest

Year 11

Indices & standard form

Bounce back: Quadratic equations

Constructions & Loci

Probability & diagrams

Perimeter, area & volume

Averages

Angles & Transformations

Straight line & other graphs

Expressions & equations

Pythagoras & Trigonometry

Year 10

Graphs

Fractions & percentages

Sequences

Pythagoras & Trigonometry

Ratio & proportion

Fractions & percentages

Data handling

Handling data & measures of location

Angles in parallel lines, lines & polygons

Fractions & percentages

Year 9

Algebra: including substitution & brackets

Number; including index laws

Area of trapezia & circles; Line symmetry & reflections

Standard form & number sense

Indices, Sequences & percentages

Sets & probability

Proof

Multiplicative reasoning

Working in Cartesian plane

Brackets, equations & inequalities

Year 8

Ratio & proportion

Geometric reasoning

Prime numbers

Ratio & scale

Multiplying & dividing fractions

Representing data, tables & probability

Fraction arithmetic

Operations with directed numbers

Fraction & % of amounts

Fractions, decimals & percentages

Use and understand algebraic notation

Place value and ordering, including decimals

Year 7

Problem solving with four main operations

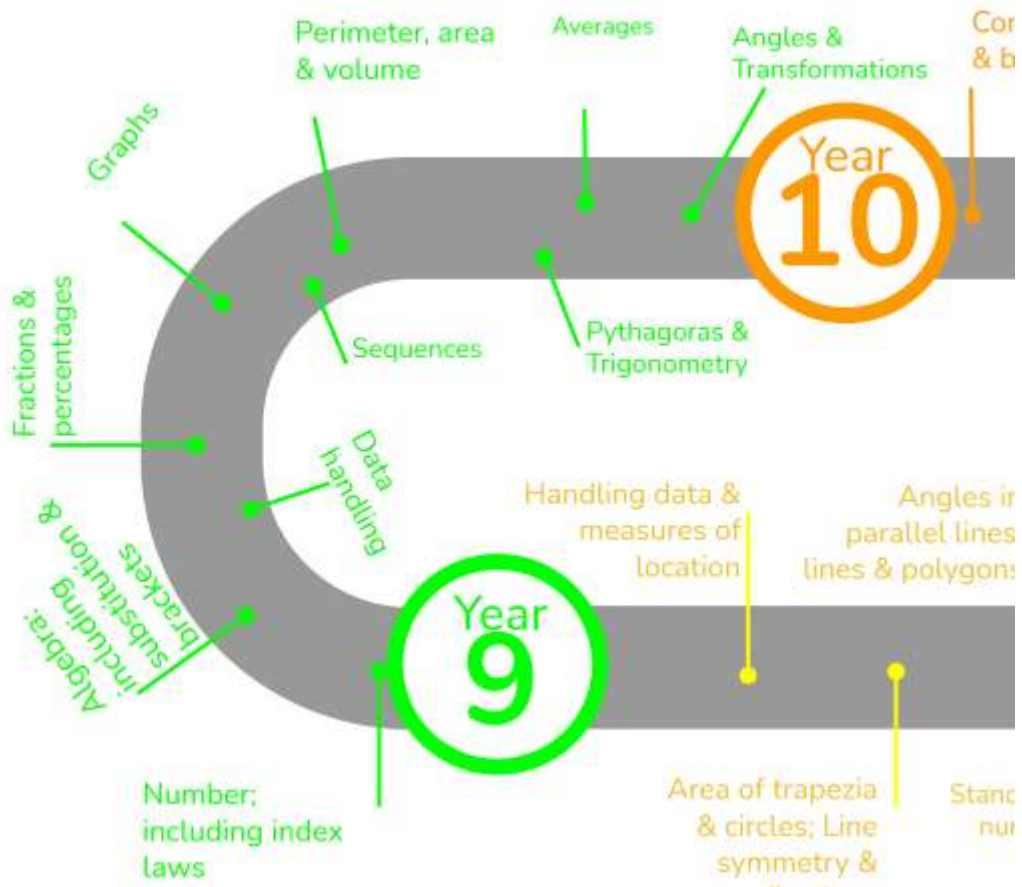
Equality & Equivalence - solving equations

Sequences



Core/Foundation 2021/22 (includes Y11 bounce back)

This is what your child will be taught in Year 9 in MATHS



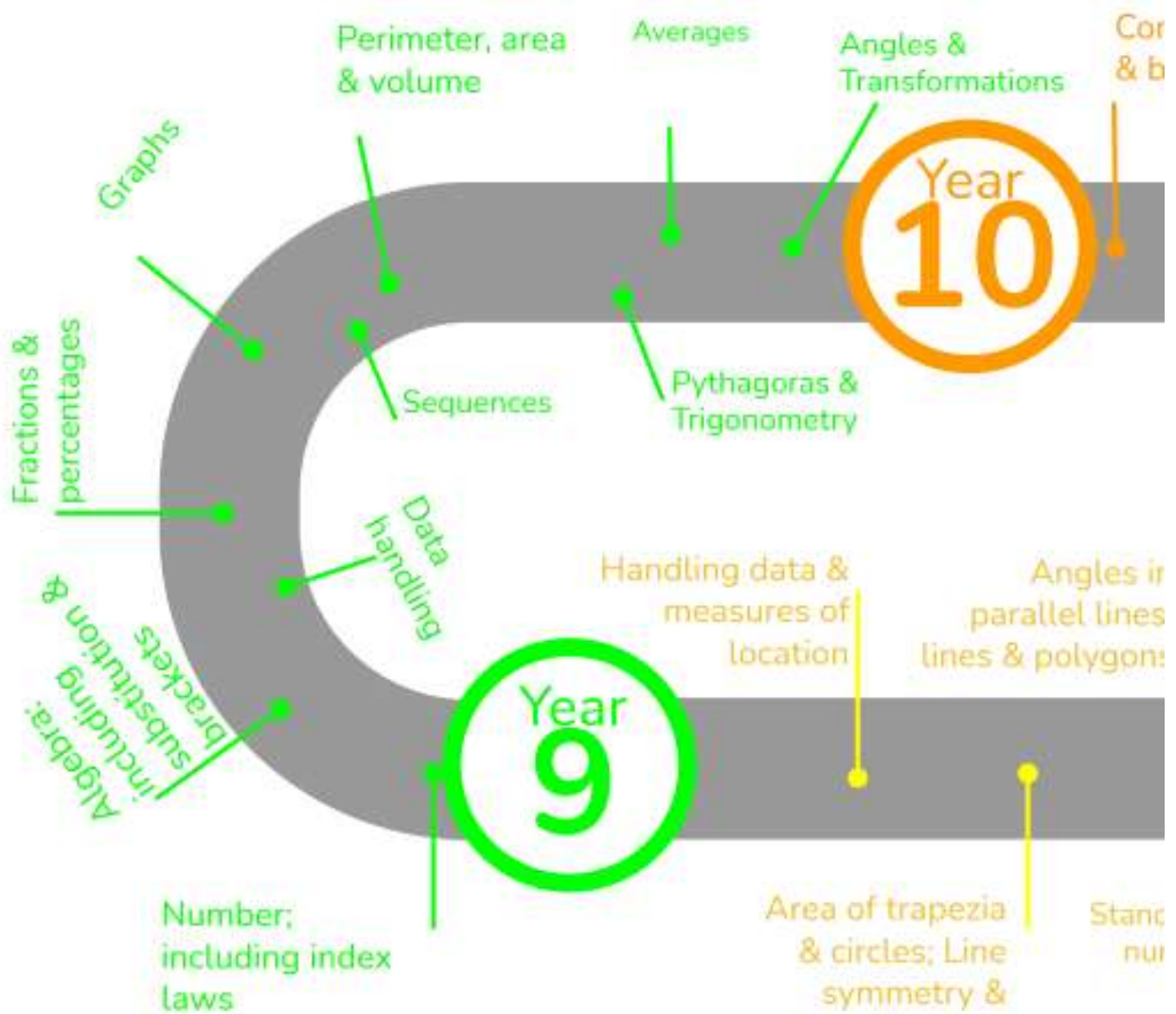
Cross Curricular Lessons



They will have also have specific lessons linked to other subjects and a diet of retrieval built into their lessons

In Year 9 Module 1 your child will study only 2 topics

- NUMBER
- ALGEBRA



Unit 1: NUMBER



Topics covered include:

- 4 operations (addition, subtraction, multiplication and division with integers and decimals)
- Rounding to decimal places and significant figures
- Estimation
- Types of numbers: factors, multiples and primes
- Lowest common factor and highest common multiple.
- Index laws with number

Multiples

The "times table" of a given number

All the numbers in this lists below are multiples of 3

3, 6, 9, 12, 15...

$3x, 6x, 9x \dots$

This list continues and doesn't end

Non example of a multiple

4.5 is not a multiple of 3 because it is 3×1.5

Not an integer

x could take any value and as the variable is a multiple of 3 the answer will also be a multiple of 3

Factors

Arrays can help represent factors

5 x 2 or 2 x 5

Factors of 10 (2, 5, 10)

10×1 or 1×10

The number itself is always a factor

Factors and expressions

$6x \times 1$ OR $6 \times x$

Factors of $6x$ (6, x , $1, 6x, 2x, 3, 3x, 2$)

$2x \times 3$

$3x \times 2$

Prime numbers

2

- Integer
- Only has 2 factors and itself

The first prime number
The only even prime number

Learn or how-to quick recall...

2, 3, 5, 7, 11, 13, 17, 19, 23, 29...

Keywords

Integer: a whole number that is positive or negative

Rational: a number that can be made by dividing two integers

Irrational: a number that cannot be made by dividing two integers

Inverse operation: the operation that reverses the action

Quotient: the result of a division

Product: the result of a multiplication

Multiples: found by multiplying any number by positive integers

Factor: integers that multiply together to get another number

Unit 1: NUMBER



Round to decimal places

"To 1dp" - to one number after the decimal
 "To 2dp" - to two numbers after the decimal

2.46192 (to 1dp) - Is this closer to 24 or 25



2.46192 (to 2dp) - Is this closer to 246 or 247



Focus on the numbers **after** the decimal point

2.46192 This shows the number is closer to 25

2.46192 This shows the number is closer to 246

Round to 1 significant figure

370 to 1 significant figure is 400

37 to 1 significant figure is 40

37 to 1 significant figure is 4

0.37 to 1 significant figure is 0.4

0.00000037 to 1 significant figure is 0.0000004

Round to the first non zero number

Estimation

Estimations are useful - especially when using fractions and decimals to check if your solution is possible.

Most estimations round to 1 significant figure

Estimations are useful - especially when using fractions and decimals to check if your solution is possible.

$$210 + 899 < 1200$$

This is true because even if both numbers were rounded up, they would reach
 $300 + 900$

The correct estimation would be
 $200 + 900 = 1100$.

HCF/LCM

R

1 is a common factor of all numbers

Common factors are factors two or more numbers share

HCF - Highest common factor

HCF of 18 and 30

18: 1, 2, 3, 6, 9, 18

30: 1, 2, 3, 5, 6, 10, 15, 30

HCF = 6

LCM - Lowest common multiple

LCM of 9 and 12

9: 9, 18, 27, 36, 45, 54

12: 12, 24, 36, 48, 60

LCM = 36

The first time their multiples match

Order of operations

R

Brackets Operations in brackets are calculated first

Other operations e.g. powers, roots,

Multiplication/Division

They are carried out in the order from left to right in the question

Addition/Subtraction

They are carried out in the order from left to right in the question

In the algebra unit your child will study:

- Writing expressions and collecting like terms
- Multiplying and dividing expressions
- Index laws with algebra
- Substitution
- Expanding single brackets and simplifying
- Factorising expressions
- Expanding two brackets
- Solving equations



Addition/ Subtraction Laws

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

Keywords

Simplify: grouping and combining similar terms

Substitute: replace a variable with a numerical value

Equivalent: something of equal value

Coefficient: a number used to multiply a variable.

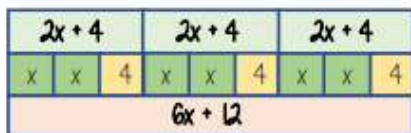
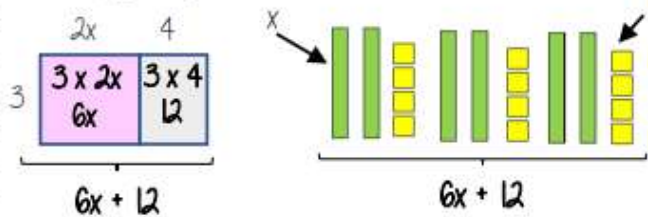
Product: multiply terms

Highest Common Factor (HCF): the biggest factor (or number that multiplies to give a term)

Inequality: an inequality compares two values showing if one is greater than, less than or equal to another

Multiply single brackets

$$3(2x + 4)$$



Different representations of $3(2x+4) = 6x + 12$

Substituting known variables

A line has the equation $3x + y = 14$

Two different variables, two solutions:

Stephane knows the point $x = 4$ lies on that line. Find the value for y

$$3x + y = 14$$

$x = 4$

$$3(4) + y = 14$$

$$12 + y = 14$$

$$-12 \quad -12$$

$$y = 2$$

Substituting in an expression

Substitute $2y$ in place of the x variable as they represent the same value.

$$x = 2y$$

$$x + y = 30$$

$$x + y = 30$$

$$x + y = 30$$

$$x = 2y \quad x + y = 30$$

$$3y = 30$$

$$3y = 30$$

$$+3 \quad +3$$

$$y = 10$$

$$x = 2y$$

$$x = 20$$

Pair of simultaneous equations (two representations)

Unit 2: ALGEBRA



Zero and negative indices

$$x^0 = 1$$

Only number divided by itself - 1

$$\frac{a^6}{a^6} = a^6 \div a^6$$

$$= a^{6-6} = a^0 = 1$$

Negative indices do not indicate negative solutions

Looking at the sequence can help to understand negative powers

$$\left. \begin{array}{l} 2^2 = 4 \\ 2^1 = 2 \\ 2^0 = 1 \\ 2^{-1} = \frac{1}{2} \\ 2^{-2} = \frac{1}{4} \end{array} \right\}$$

Powers of powers

$$(x^a)^b = x^{ab}$$

$$(2^3)^4 = \underbrace{2^3 \times 2^3 \times 2^3 \times 2^3}$$

The same base and power is repeated Use the addition law for indices

$$(2^3)^4 = 2^{12} \leftarrow a \times b = 3 \times 4 = 12$$

NOTICE the difference

$$(2x^3)^4 = \underbrace{2x^3 \times 2x^3 \times 2x^3 \times 2x^3}$$

The addition law applies ONLY to the powers
The integers still need to be multiplied

$$(2x^3)^4 = 16x^{12}$$

Like and unlike terms

Like terms are those whose variables are the same

♥ and 3♥ are like terms
the variable is the same

★ and 3♥ are unlike terms
the variables are NOT the same

Examples and non-examples

Like terms

y, 7y
 $2x^2, x^2$
ab, 10ba
5, -2

Un-like terms

y, 7x
 $2x^2, 2c^2$
ab, 10a
5, -2t

Note here ab and ba are commutative operations, so are still like terms

Equations with unknown on both sides

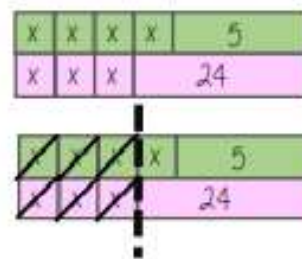
$$4x + 5 = 3x + 24$$

$$-3x \quad -3x$$

$$x + 5 = 24$$

$$-5 \quad -5$$

$$x = 19$$



Algebraic constructs

Expression

A sentence with a minimum of two numbers and one maths operation

Equation

A statement that two things are equal

Term

A single number or variable

Identity

An equation where both sides have variables that cause the same answer includes \equiv

Formula

A rule written with all mathematical symbols e.g. area of a rectangle $A = b \times h$

Unit 2: ALGEBRA

We recommend pupils have a Casio scientific calculator.

The Casio calculator featured is the one we use when demonstrating in lessons.



