

Year 7 Mathematics Overview

Autumn Term 1			Autumn Term 2			Assessments
The Structure of the number system			Operating on number	Sequences and Graphs		
Crystal Maze	Place Value	Properties of Number: Factors, Multiples, Squares and Cubes	Arithmetic Procedures with Integers and Decimals	Graphical Representations		
				F.D.P.		
Spring Term 1			Spring Term 2			
The Structure of the number system		Geometry	The Structure of the number system			
Expressions and Equations		Perimeter and Area	Ordering and Comparing			
Algebra		Calculation	F.D.P.			
Summer Term 1			Summer Term 2			
Operating on number	Multiplicative Reasoning		Geometry		Assessments	
Arithmetic Procedures with Integers and Decimals	Understanding Multiplicative Reasoning		Transforming Shapes			
	Others		Geometry			
F.D.P.	Others		Geometry			

- Number & Place Value
- Calculation
- Geometry
- Statistics
- Algebra
- F.D.P.
- Others



Crystal Maze

Year 7 Mathematics Overview

Place Value



Understand place value in integers



Understand place value in decimals, including recognising exponent and fractional representations of the column headings














Understand place value in the context of measure



Order and compare numbers and measures using $<$, $>$, $=$

Year 7 Mathematics Overview

Properties of Number: Factors, Multiples, Squares and Cubes

-  Understand what a multiple is and be able to list multiples of n
-  Identify and explain whether a number is or is not a multiple of a given integer
-  Understand the concept of square and cube
-  Understand the concept of square root and cube root
-  Understand and use correct notation for positive integer exponents
-  Understand how to use the keys for squares and other powers and square root on a calculator
-  Understand what a factor is and be able to identify factors of positive integers
-  Understand what a prime number is and be able to identify prime numbers
-  Understand that a positive integer can be written uniquely as a product of its prime factors
-  Use the prime factorisation of two or more positive integers to efficiently identify the highest common factor
-  Use the prime factorisation of two or more positive integers to efficiently find their lowest common multiple

Year 7 Mathematics Overview

Arithmetic Procedures with Integers and Decimals

- Understand the mathematical structures that underpin addition and subtraction of positive and negative integers
- Generalise and fluently use written addition and subtraction strategies, including columnar formats, with decimals
- Understand the mathematical structures that underpin multiplication and division of positive and negative integers
- Factorise multiples of $10n$ in order to simplify multiplication and division of both integers and decimals, e.g. 300×7000 , 0.3×0.007 , $0.9 \div 0.03$, etc.
- Generalise and fluently use written multiplication strategies to calculate accurately with decimals
- Generalise and fluently use written division strategies to calculate accurately with decimals
- Know the commutative law and use it to calculate efficiently
- Know the associative law and use it to calculate efficiently
- Know the distributive law and use it to calculate efficiently
- Calculate using priority of operations, including brackets, powers, exponents and reciprocals
- Use the associative, distributive and commutative laws to flexibly and efficiently solve problems
- Know how to fluently use certain calculator functions and use a calculator appropriately

Year 7 Mathematics Overview

Graphical Representations



Describe coordinates, including non-integer values, in all four quadrants



Plot coordinates, including non-integer values, in all four quadrants



Solve a range of problems involving coordinates

Year 7 Mathematics Overview

Expressions, Equations and Formulae



Understand that a letter can be used to represent a generalised number



Understand that algebraic notation follows particular conventions and that following these aids clear communication



Know the meaning of and identify: term, coefficient, factor, product, expression, formula and equation



Understand and recognise that a letter can be used to represent a specific unknown value or a variable



Understand that relationships can be generalised using algebraic statements



Understand that substituting particular values into a generalised algebraic statement gives a sense of how the value of the expression changes



Identify like terms in an expression, generalising an understanding of unitising



Simplify expressions by collecting like terms



Understand how to use the distributive law to multiply an expression by a term



Understand how to use the distributive law to factorise expressions where there is a common factor



Apply understanding of the distributive law to a range of problem-solving situations and contexts

Year 7 Mathematics Overview

Perimeter and Area



Use the properties of a range of polygons to deduce their perimeters



Derive and use the formula for the area of a trapezium



Understand that the areas of composite shapes can be found in different ways

Year 7 Mathematics Overview

Ordering and Comparing

- Understand that 1 can be written in the form n / n
- Convert between improper fractions and mixed numbers
- Understand that a fraction represents a division
- Any terminating decimal can be written as a fraction with a denominator of the form $10n$
- Understand the process of simplifying fractions
- Convert from fractions to decimals and back again using the converter key on a calculator
- Enter fractions as divisions on a calculator and understand the limitations of the decimal representation that results
- Compare negative integers using $<$ and $>$
- Compare decimals using $<$ and $>$
- Compare and order fractions by converting to decimals
- Compare and order
- Order a variety of positive and negative fractions and decimals
- Appreciate that, for any two numbers there is always another number in between them

Year 7 Mathematics Overview

Arithmetic Procedures with Integers and Decimals



Understand the mathematical structures that underpin the addition and subtraction of fractions



Generalise and fluently use addition and subtraction strategies to calculate with fractions and mixed numbers



Understand the mathematical structures that underpin the multiplication of fractions



Understand how to multiply unit, non-unit and improper fractions



Generalise and fluently use strategies to multiply with mixed numbers



Understand the mathematical structures that underpin the division of fractions



Divide a fraction by a whole number



Divide a whole number by a fraction



Divide a fraction by a fraction


Year 7 Mathematics Overview


Understanding Multiplicative Reasoning


- 1. Appreciate that any two numbers can be connected via a multiplicative relationship
- 2. Understand that a multiplicative relationship can be expressed as a ratio and as a fraction
- 3. Be able to calculate the multiplier for any given two numbers
- 4. Appreciate that there are an infinite number of pairs of numbers for any given multiplicative relationship (equivalence)
- 5. Use a double number line to represent a multiplicative relationship and connect to other known representations
- 6. Understand the language and notation of ratio and use a ratio table to represent a multiplicative relationship and connect to other known representations
- 7. Find a fraction of a given amount
- 8. Given a fraction and the result, find the original amount
- 9. Express one number as a fraction of another
- 10. Be able to divide a quantity into a given ratio
- 11. Be able to determine the whole, given one part and the ratio
- 12. Be able to determine one part, given the other part and the ratio
- 13. Use ratio to describe rates (e.g. exchange rates, conversions, cogs, etc.)


Year 7 Mathematics Overview


Transforming Shapes

 Understand the nature of a translation and appreciate what changes and what is invariant


 Understand the minimum information required to describe a translation (vertical and horizontal displacement)


 Translate objects from information given in a variety of forms


 Understand the nature of rotations and appreciate what changes and what is invariant


 Understand the minimum information required to describe a rotation (centre of rotation, size and direction of rotation)


 Rotate objects using information about centre, size and direction of rotation


 Understand the nature of reflections and appreciate what changes and what is invariant

 Understand the minimum information required to describe a reflection (line of reflection)

 Reflect objects using a range of lines of reflection (including non-vertical and non-horizontal)

 Understand the nature of enlargements and appreciate what changes and what is invariant

 Understand the minimum information required to describe an enlargement (centre of enlargement and scale factor)

 Enlarge objects using information about the centre of enlargement and scale factor