YEAR 7

Autumn Term

Sequences

- Describe and continue a sequence given diagrammatically
- Predict and check the next term(s) of a sequence
- Represent sequences in tabular and graphical forms
- Recognise the difference between linear and non-linear sequences
- Continue numerical linear sequences
- Continue numerical non-linear sequences
- Explain the term-to-term rule of numerical sequences in words
- Find missing numbers within sequences   H

Understand & Use Notation

- Given a numerical input, find the output of a single function machine
- Use inverse operations to find the input given the output
- Use diagrams and letters to generalise number operations
- Use diagrams and letters with single function machines
- Find the function machine given a simple expression
- Substitute values into single operation expressions
- Find numerical inputs and outputs for a series of two function machines
- Use diagrams and letters with a series of two function machines
- Find the function machines given a two-step expression
- Substitute values into two-step expressions
- Generate sequences given an algebraic rule
- Represent one- and two-step functions graphically

YEAR 7

Autumn Term

Equality and Equivalence

- Understand the meaning of equality
- Understand and use fact families, numerically and algebraically
- Solve one-step linear equations involving + / - using inverse operations
- Solve one-step linear equations involving x / ÷ using inverse operations
- Understand the meaning of like and unlike terms
- Understand the meaning of equivalence
- Simplify algebric expressions by collecting like terms, using the ≡ symbol

Place Value and Ordering

- Recognise the place value of any number in an integer up to one billion
- Understand and write integers up to one billion in words and figures
- Work out intervals on a number line
- Position integers on a number line
- Round integers to the nearest power of ten
- Compare two numbers using =, ≠, <, >, ≤, ≥
- Order a list of integers
- Find the range of a set of numbers
- Find the median of a set of numbers
- Understand place value of decimals
- Position decimals on a number line
- Compare and order any number up to one billion
- Round a number to 1 significant figure
- Write 10, 100, 1,000 etc. as powers of ten

H

YEAR 7

Autumn Term

Place Value and Ordering

- Write positive integers in the form $A \times 10^n$ — H
- Investigate negative powers of ten — H
- Write decimals in the form $A \times 10^n$ — H

FDP Equivalence

- Represent tenths and hundredths as diagrams
- Represent tenths and hundredths on number lines
- Interchange between fractional and decimal number lines
- Convert between fractions and decimals- tenths and hundredths
- Convert between fractions and decimals- fifths and quarters
- Convert between fractions and decimals- eighths and thousandths — H
- Understand the meaning of percentage using a hundred square
- Convert fluently between simple fractions, decimals and percentages
- Use and interpret pie charts
- Represent any fraction as a diagram
- Represent fractions on number lines
- Identify and use simple equivalent fractions
- Understand fractions as division
- Convert fluently being fractions, decimals and percentages
- Explore fractions above one, decimals and percentages — H

Ratio and Scale

- Understand the meaning and representation of ratio
- Understand and use ratio notation
- Solve problems involving ratios of the form 1 : n (or n : 1)
- Solve proportional problems involving the ratio m : n
- Divide a value into a given ratio
- Express ratios in their simplest integer form
- Express ratios in the form 1 : n   H
- Compare ratios and related fractions
- Understand π as the ratio between diameter and circumference
- Understand gradient of a line as a ratio   H

Multiplicative Change

- Solve problems involving direct proportion
- Explore conversion graphs
- Convert between currencies
- Explore direct proportion graphs   H
- Explore relationships between similar shapes
- Understand scale factors as multiplicative representations
- Draw and interpret scale diagrams
- Interpret maps using scale factors and ratios

Multiplying and Dividing Fractions

- Represent multiplication of fractions
- Multiply a fraction by an integer
- Find the product of a pair of unit fractions
- Find the product of a pair of any fractions
- Divide an integer by a fraction
- Divide a fraction by a unit fraction
- Understand and use the reciprocal
- Divide any pair of fractions

YEAR 8

Autumn Term

Multiplying and Dividing Fractions

- Multiply and divide improper and mixed fractions   H
- Multiply and divide algebric fractions   H

Working in the Cartesian Plane

- Work with coordinates in all four quadrants
- Identify and draw lines that are parallel to the axes
- Recognise and use the line y = x
- Recognise and use lines of the form y = kx
- Link y = kx to direct proportion problems
- Explore the gradient of the line y = kx   H
- Recognise and use lines of the form y = x + a
- Explore graphs with negative gradient (y = -kx, y = a - x, x + y = a)
- Link graphs to linear sequences
- Plot graphs of the form y = mx + c
- Explore non-linear graphs   H
- Find the midpoint of a line segment   H

Representing Data

- Draw and interpret scatter graphs
- Understand and describe linear correlation
- Draw and use line of best fit
- identify non-linear relationships
- Identify different types of data
- Read and interpret ungrouped frequency tables
- Read and interpret grouped frequency tables
- Represent grouped discrete data
- Represent continuous data grouped into equal classes
- Represent data in two-way tables

YEAR 8

Autumn Term

CYCLES Learning Centre

Tables and Probability

- Construct sample spaces for 1 or more events
- Find probabilities from a sample space
- Find probabilities from two-way tables
- Find probabilities from Venn diagrams
- Use the product rule for finding the total number of possible outcomes

H

YEAR 9

Autumn Term

Straight Line Graphs

- Lines parallel to the axes, $y = x$ and $y = -x$
- Using tables of values
- Compare gradients
- Compare intercepts
- Understand and use $y = mx + c$
- Write an equation in the form $y = mx + c$ H
- Find the equation of a line from a graph
- Interpret gradient and intercepts of real-life graphs
- Model real-life graphs involving inverse proportion   H
- Explore perpendicular lines

Forming and Solving Equations

- Solve one- and two-step equations and inequalities
- Solve one- and two-step equations and inequalities with brackets
- Inequalities with negative numbers
- Solve equations with unknown on both sides
- Solve inequalities with unknown on both sides
- Solving equations and inequalities in context
- Substituting into formulae and equations
- Rearrange formulae (one-step)
- Rearrange formulae (two-step)
- Rearrange complex formulae including brackets and squares   H

Testing Conjectures

- Factors, Multiples and Primes
- True or false?
- Always, Sometimes, Never true

YEAR 9

Autumn Term

Testing Conjectures

- Show that
- Conjectures about number
- Expand a pair of binomials
- Conjectures with algebra
- Explore the 100 grid

Three-dimensional Shapes

- Know names of 2-D and 3-D shapes
- Recognise prisms
- Accurate nets of cuboids and other 3-D shapes
- Sketch and recognise nets of cuboids and other 3-D shapes
- Plans and elevations
- Find area of 2-D shapes
- Surface area of cubes and cuboids
- Surface area of triangular prisms
- Surface area of a cylinder
- Volume of cubes and cuboids
- Volume of other 3-D shapes- prisms and cylinder
- Explore volumes of cones, pyramids and spheres   H

Constructions & Congruency

- Draw and measure angles
- Construct and interpret scale drawings
- Locus of distance from a point
- Locus of distance from a straight line/shape
- Locus equidistant from two points
- Construct a perpendicular bisector
- Construct a perpendicular from a point
- Construct a perpendicular to a point

Constructions & Congruency

- Locus of distance from two lines
- Construct an angle bisector
- Construct triangles from given information
- Identify congruent figures
- Explore congruent triangles
- Identify congruent triangles