



St John's CE Middle School

Key Performance Indicators

Pupils who are working at age related expectations at the end of the year will have a secure knowledge of these Key Performance Indicators.

KS3 Year 7 Maths

Number – calculations and place value
understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals)
order positive and negative integers, decimals and fractions
round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures)
use the symbols =, ≠, <, >, ≤, ≥
use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor and lowest common multiple
use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5
apply the four operations, including formal written methods, to integers, decimals
recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions)
use conventional notation for priority of operations, including brackets
Algebra – expressions and equations
understand and use the concepts and vocabulary of expressions, equations, formulae and terms
use and interpret algebraic notation, including: ab in place of $a \times b$, $3y$ in place of $y + y + y$ and $3 \times y$, a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$, a/b in place of $a \div b$, brackets
simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket
solve linear equations in one unknown algebraically
use the symbols =, ≠, <, >, ≤, ≥
Statistics
interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data and know their appropriate use

interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (median, mean, mode and modal class) and spread (range)
Number – fractions, decimals and percentages
order positive and negative integers, decimals and fractions
express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1
Add, subtract, multiply and divide with fractions and mixed numbers
define percentage as ‘number of parts per hundred’
interpret percentages and percentage changes as a fraction or a decimal, and interpret these multiplicatively
express one quantity as a percentage of another
compare two quantities using percentages
solve problems involving percentage change, including percentage increase/decrease
Probability
apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments
relate relative expected frequencies to theoretical probability, using appropriate language and the 0 - 1 probability scale
construct theoretical possibility spaces for single experiments with equally likely outcomes and use these to calculate theoretical probabilities
apply the property that the probabilities of an exhaustive set of outcomes sum to one;
enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams
Algebra – substitution and formulae
substitute numerical values into formulae and expressions
understand and use standard mathematical formulae
Algebra – sequences and graphs
generate terms of a sequence from a term-to-term rule
recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions
work with coordinates in all four quadrants
understand and use lines parallel to the axes, $y=x$ and $y=-x$
Measurements – Measures, 2D shapes, perimeter and area
use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries
use the standard conventions for labelling and referring to the sides and angles of triangles
draw diagrams from written description
derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language
use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money, etc.)
change freely between related standard units (e.g. time, length, area, volume/capacity, mass) in numerical contexts
measure line segments and angles in geometric figures
use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate
calculate perimeters of 2D shapes
know and apply formulae to calculate area of triangles, parallelograms, trapezia
Measurements –3D shapes, volume

identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres
derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language
know and apply formulae to calculate volume of cuboids
calculate surface area of cuboids
Number – ratio and proportion
use ratio notation, including reduction to simplest form
divide a given quantity into two parts in a given part:part or part:whole ratio
Geometry – 2D shapes, angles and constructions
use the standard conventions for labelling and referring to the sides and angles of triangles
draw diagrams from written description
identify, describe and construct congruent shapes, including on coordinate axes, by considering rotation, reflection and translation
derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language
apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles
Geometry - transformations
solve geometrical problems on coordinate axes
identify, describe and construct congruent shapes, including on coordinate axes, by considering rotation, reflection and translation
describe translations as 2D vectors
identify, describe and construct congruent shapes, including on coordinate axes, by considering rotation, reflection and translation