**Maths**

**YEAR8**

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| **SOW** | **Number sense** | **Ratio and Scale** | **Multiply and divide fractions** | **Working in the cartesian plane** |
| **Knowledge** | 1. Rounding numbers to 10, 100, 1000.
2. Rounding to significant figures.
3. Rounding to decimals places.
4. Estimating the answer to a calculations.
5. Understanding and using error intervals. (Depth)
6. Calculating using order of operations.
7. Calculating with money.
8. Converting metric units of length
9. Converting metric units of weight and capacity.
10. Converting metric units of area (h)
11. Converting metric units of Volume (H)

(Depth)Solving problems involving time, time tables and the calendar. | 1. Understand the meaning of ratio. Understand and use ratio notation.
2. Solve problems in the form 1:n. Solve problems in the form m:n
3. Express ratios in simplest form. Express ratio in the form 1:n
4. Divide a value into a given ratio
5. Divide a value into a given ratio
6. Compare ratios and fractions
7. Understand pi as a ratio
8. *Understand gradient as a ratio (Depth)*
 | 1. Represent fraction multiplication. Multiply a fraction by an integer.
2. Product of unit fractions. Product of any fraction.
3. Divide an integer by a fraction. Divide a fraction by a unit fraction.
4. Divide a fraction by a unit fraction. Understand and use the reciprocal
5. Divide any pair of fractions
6. Improper and mixed fractions

*algebraic fractions (Depth)* | 1. Coordinates in four quadrants. Lines parallel to the axes.
2. Recognise and use the line y = x. Recognise and use the line y = kx.
3. Recognise and use the line y = kx.
4. Lines of the form y = x + a
5. Graphs with negative gradient
6. Plotting y = mx + c graphs
7. Plotting y = mx + c graphs
8. *Gradients of lines y = kx. Explore non-linear graphs. Midpoint of a line segment. (Depth)*
 |
| **Skills**  |
| **Vocabulary** | Number SenseRound, Significant, Power, Nearest, integer, number line, Root, Over/under estimate, Continuous, credit, Balance, Deposit, Interest. | Ratio, Equal parts, Proportion, For every, relationship, order, Colon, Multiply, units, parts, share, factors, equivalent, scale, numerator, denominator, gradient. | Denominator, numerator, inverse, improper fractions, mixed numbers, algebraic, reciprocal. | Quadrant, Coordinates, horizontal, vertical, axis, origin, Parallel, Straight line, Vertical, Equation, Graph, Linear, Gradient, slope, Y-intercept, negative, positive, midpoint. |
| **Does the knowledge above marry up with KO? If not, what needs to be amended?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. |
| **How does this knowledge link to/build on prior knowledge?** | Rounding numbersOrder of operationsUse of a calculatorUnits of measure | Understand the language of ratio (Y6)Understand the use of the ratio symbol (Y6)Representing ratio using bar model (Y6) | Understand a fraction and what it represents Division is the inverse operation of multiplication Numerator and Denominator Link between fractions and decimals Improper fractions and mixed numbersMultiplying and dividing algebraic terms | Coordinates - interpreting and plottingAxes – understand they have equal intervalsSubstitution into expressions |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes | Yes | Yes |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes |

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| **SOW** | Indices/standard form | Brackets, equations and inequalities | Fractions and percentages | Representing Data |
| **Knowledge** | 1. Adding and subtracting expressions with indices.
2. Simplifying algebraic expressions by multiplying indices.
3. Simplifying algebraic expressions by dividing indices.
4. Using the addition and subtraction law for indices.

Exploring powers of powers (Depth).1. Investigate positive powers of 10. Standard form with numbers greater than 1.
2. Investigate negative powers of 10. Standard form with numbers between 0 and 1.
3. Order numbers in standard form.
4. Add and subtract numbers in standard form
5. Multiply and divide numbers in standard form
6. Standard form using a calculator. (Depth)
 | 1. Forming algebraic expressions.
2. Use Direct numbers with algebra
3. Multiply out single brackets
4. Expand single brackets.
5. Expand a pair of binomials (Depth)
6. Solve equations, including with brackets.
7. Form and solve equations with brackets.
8. Understand and solve simple inequalities.
9. Form and solve inequalities.
10. Form and Solve equations and inequalities with unknowns both sides. (Depth)

Identify and use formulae, expressions, identities and equations. | 1. Quick review of converting between common fractions, decimals and percentages.
2. Calculate percentage of an amount – non-calculator method
3. Calculate percentage of an amount – calculator method
4. Understanding multipliers – increase and decrease
5. Use multipliers to calculate percentage increase and decrease
6. Express a fraction as a percentage – both non and calculator methods
7. Calculate percentage change
8. *Find original less than 100%. Find original more than 100%. (Depth)*
 | 1. Draw and interpret scatter graphs
2. Draw and interpret scatter graphs. Linear and non-linear correlation.
3. Linear correlation. Line of best fit 1 and 2.
4. Identify different types of data.
5. Ungrouped frequency tables. Read and interpret grouped tables.
6. Represent grouped discrete data. Represent continuous data
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| **Skills**  |
| **Vocabulary** | Base, Exponent, Negative, Place value, Commutative, Standard form, Reciprocal, root. Expression, simplify, term, coefficient, index, indices, power, multiply, product, expand, numerator, denominator, factor, base, exponent. | Expression, simplify, term, substitute, coefficient, term, equivalent, directed, solve, simplify, expand, multiply out, coefficient, bracket, product, factor, factorise, HCF, like terms, coefficient, equation, inequality, solution set | Fraction, Decimal, Percentage, Equivalent, Denominator, Numerator, Fraction Key, Rounding, Conversion, Estimate, Hundredth, Tenth, Decrease, multiplier, Growth, increase, Factor, Multiple, Round, Integer, Invest, Change, Loss, Interest, Original, Reverse, Express. | Variable, relationship, origin, scale, coordinate, axis, increase, decrease, correlation, positive, negative, continuous, weak, line of best fit, estimate, extrapolate, outlier, straight, non-linear, quantitative, counted, frequency, ungrouped, subtotal, tally, range, discrete, fraction, percentage |
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| **How does this knowledge link to/build on prior knowledge?** | Square and square rootsAlgebraic notation | Algebraic notationCollecting like termsSolving one step equations | Fraction, decimal and percentage equivalence. Define percentage as a number ‘as part of one hundred’. | Drawing and labelling axesInterpreting axes Plotting coordinates Interpreting tables Tally tables |
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| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes |

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| **SOW** | Tables and probability | Angles in parallel lines and polygons | Area of trapezia and circles | Measures of location |  |
| **Knowledge** | 1. Construct sample spaces for 1 or more events. Calculate probability from a sample space.
2. Represent data in two-way tables . Calculate probability from two-way tables.
3. Calculate probability from two-way tables.
4. Find probabilities from Venn diagrams.
5. *Use the product rule for finding the total number of possible outcomes (Depth)*
 | 1. Basic angle rule recap. Angles between parallel lines.
2. Alternate, corresponding and co-interior angles.
3. Alternate, corresponding and co-interior angles.
4. Recap triangles and quadrilaterals. Properties
5. Parallel line problems
6. Recap on types of polygons. Sum of exterior angles.
7. Sum of interior angles in polygons
8. Missing angles in regular polygons.
9. *Prove geometric facts. Perpendicular line bisectors. Angle bisectors (Depth).*
 | 1. Calculate the area of rectangles, triangles and parallelograms.
2. Calculate the area of a trapezium
3. Calculate the perimeter and area of compound shapes (including rectangles, triangles, parallelograms and trapeziums)
4. Calculate the perimeter and area of compound shapes (including rectangles, triangles, parallelograms and trapeziums)
5. Investigate the area of a circle

*Calculate the area of circle parts with and without a calculator (Depth)* | 1. Understanding mean, median and mode.
2. Choosing the appropriate averages.
3. Identify outliers
4. Compare distribution using average and the range
5. Find the mean from an ungrouped frequency table.
6. Finding mean from a grouped frequency table.

(Depth) |  |
| **Skills**  |
| **Vocabulary** | Outcomes, sample space, probability, systematic, chance, event, unbiased, equally likely, denominator, two-way table, intersection, region, union, product, possibilities, table, total | Adjacent, Angles at a point, Vertically Opposite, Straight, Acute, Transversal, Alternative, Corresponding, Parallel, Supplementary, Points, Alternate, Co-interior.  | Formula, Area, Triangle, Square, parallelogram, Rhombus, Trapezium/Trapezia, Perpendicular, compound, Estimate, Approximate, Diameter, Radius. | Average, Mean, Median, Mode, modal, Total, Frequency, Represent, Subtotal, Estimate, midpoint, Outlier, Range, Consistent. |  |
| **Does the knowledge above marry up with KO?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. | No – need to reorder and combine topics. |
| **How does this knowledge link to/build on prior knowledge?** | Calculating probabilitySample space | Angles on a straight-line sum to 180. Angles around a point sum to 360. Vertically opposite angles are equal. | Meaning of perpendicular.Representation of area. Properties of 2-D shapes. Identify parallel lines. | Finding mode, median and mean |  |
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| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | No | No | No | No | No |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes | Yes |