**Maths**

**YEAR7**

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| **SOW** | **Directed Number** | **Sequences 1** | **Algebraic notation** | **Equality and Equivalence** |
| **Knowledge** | 1. Literacy Pre Teach (Go Task) Representations of directed number. Order directed number.
2. Add and subtract directed number.
3. Multiplication and division of directed number.
4. Multiplication and division of directed number.
5. Evaluate algebraic expressions with directed number (using calculator).
6. Order of operations with directed number.

*If time allows - roots of positive numbers. Explore higher powers and roots. Depth* | 1. Literacy Pre Teach (Go Task) Describe and continue sequences. Predict and check next terms (Including sequences involving diagrams)
2. Sequences in a table and graphically
3. Linear and Non-Linear Sequences including finding terms and explaining term to term rule
4. Linear and Non-Linear Sequences including finding terms and explaining term to term rule
5. Finding harder missing terms in sequences (**Depth)**
 | 1. Literacy Pre Teach (Go Task) Function Machines – 1 and 2 step and finding input given output.
2. Use diagrams and letters to generalise numbers
3. Single function machines (algebra). Find function given simple expression.
4. Two step function machine (algebra). Find functions from expressions.
5. Substitute – single expression and two-step. Depth Including more difficult substitution (Squares, roots, division, cubes) Two lessons
6. Generate sequences from a rule.

Depth – Look at plotting functions graphically to identify trends and patterns.  | 1. Literacy Pre Teach (Go Task) Understand equality. Understand and use fact families numerically.
2. Understand and use fact families algebraically.
3. Solving one step equations – adding, subtracting, multiplying and dividing. Depth – look at harder equations involving squares, roots and other functions. Two lessons
4. Understand like and unlike terms

Collecting like terms using the identity symbol |
| **Skills**  |
| **Vocabulary** | positive, negative, reflection, symmetric, ascend, descend, greater, less, increase, decrease, difference, add, subtract, minus, zero pair, partition, product, multiply, commutative, inverse, calculator, power, indices, root, exponent | sequence, term, position, rule, table, graph, axes, linear, non-linear, difference, ascend, descend, constant, geometric, Fibonacci, arithmetic | function, input, output, estimate, operation, square, inverse, bar model, variable, coefficient, commutative, expression, order, evaluate, substitute, bracket, constant, equation, notation | equality, equation, equals, equal to, equivalent, fact family, solve, solution, unknown, inverse, term, like, unlike, coefficient, index, expression, collect, simplify |
| **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?** | Number linesValue of negative numbers | Recognising patterns Number factsBasic arithmetic skills | Function MachinesBar ModellingInverse Operations | Bar ModellingInverse Operations Algebraic Notation Understanding of equivalenceSubstitution |
| **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** | **Sequences 2** | Place Value and ordering decimals | Solving problems Addition and subtraction | Solving problems Multiplication and division |
| **Knowledge** | 1. Literacy Pre Teach (Go Task) Generate sequences given a rule in words.
2. Generate sequences give a simple algebraic rule.
3. Generate sequences given a complex algebraic rule
4. Find the nth term of a linear sequence. (Depth)
 | 1. Literacy Pre Teach (Go Task) Recognise integer place value. Understand and write integers. Work out intervals on a number line. Position integers on a number line.
2. Position numbers on a number line. Round to powers of 10.
3. Compare integers with =, <, >. Order a list of integers.
4. Find the range and median of a list of integers.
5. Understand place value – decimals. Position decimals on a number line. Compare and order any numbers.
6. Round to 1 significant figure.
7. Investigate positive powers of ten.

*(Depth) – positive and negative integers in the form A x 10n**Decimals in the form A x 10n* *Investigate negative powers of 10*  | 1. Literacy Pre Teach (Go Task) Properties of addition and subtraction. Mental strategies.
2. Use formal methods for the addition of integers and decimals
3. Use formal methods for the subtraction of integers and decimals
4. Solve problems with bar charts and line graphs
5. Solve financial problems
6. Tables and Timetables
7. Frequency Trees

*Depth: Add and subtract in standard form*  | 1. Literacy Pre Teach (Go Task) Properties of multiplication and division including factors and multiples.
2. Multiply and divide by powers of 10. Multiply and divide by 0.1 and 0.01.
3. Convert metric units
4. Formal methods: multiply integers and decimals
5. Formal methods: divide integers and decimals
6. Order of operations
7. Solve problems involving the mean
8. Calculate the area of a rectangle, parallelogram and triangle
9. Calculate the area of trapezia

*Depth - Multiplication and division with algebra Depth* |
| **Skills**  |
| **Vocabulary** | Sequence, position, term, linear, non-linear, Fibonacci, difference, constant, term-to-term, integer, algebraic, bracket, expand, substitute, rule, position-to-term, coefficient,  | place value, holder, digit, billion, integer, interval, scale, space, approximate, convention, round, equal, greater, less, ascend, descend, range, difference, median, order, average, decimal, tenth, hundredth, significant figure | subtract, add, total, sum, difference, commutative, associative, inverse, bridging, compensation, partition, bond, column method, carry, exchange, estimate, decimal, formal, mental, calculator | product, factor, array, multiply, divide, inverse, quotient, commutative, integer, convert, milli-, centi-, kilo-, metric, estimate, efficient, remainder, divisor, dividend |
| **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?** | Recognising patterns Number factsBasic arithmetic skills | Place value Equal division Understanding of decimalsInequality signs  | Place value.Fact families.Part, model, whole.Understanding commutative and associative properties of addition.Non-commutative property of subtraction.Add and subtract using a formal method. | Place value.Fact families.Part, model, whole.Multiplication and addition are associativeDivision is not associativeFactorsMultiples |
| **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** | **Prime numbers and proofs** | FDP equivalence | Addition and subtraction of fractions | Fractions and percentages of amounts | Sets and probability |
| **Knowledge** | 1. Literacy Pre Teach (Go Task) Find and use multiples involving problems and time.
2. Find factors of numbers and expressions
3. Recognise prime numbers, square numbers and triangular numbers
4. Find the prime factors of a number
5. Use Venn diagrams to calculate HCF
6. Use Venn diagrams to calculate LCM
7. Find the HCF and LCM in other ways with smaller numbers.
8. Literacy check and assessment lesson.

Depth – Make and test conjectures involving factors, multiples, primes, squares and cubes and then find ways to disprove them.  | 1. Literacy Pre Teach (Go Task) Represent tenths and hundredths as a diagram and on a number line. Represent fraction and decimals on a number line.
2. Convert tenths and hundredths. Convert fifths and quarters. *Convert eighths and thousandths.*
3. Convert simple FDP
4. Represent any fraction as a diagram. Represent fractions on number lines.
5. Identify and use equivalent fractions.
6. Understand fractions as division
7. Convert fluently between FDP Two lessons stretch and support here for those who need.

*Depth – Use and interpret simple pie charts. Explore fractions above 1.*  | 1. Literacy Pre Teach (Go Task) Understand representations of fraction. Convert between mixed numbers and fractions. Understand and use equivalent fractions.
2. Add and subtract fractions with the same denominator (may not need a whole lesson)
3. Add and subtract fractions from integers
4. Add and subtract fractions (common multiples first then any denominator)
5. Add and subtract fractions (common multiples first then any denominator)
6. Add and subtract improper fractions and mixed numbers
7. Add and subtract fractions and decimals
8. Literacy check and assessment lesson.

*If time allows - add and subtract algebraic fractions. Depth* | 1. Literacy Pre Teach (Go Task) Find fractions of given amount
2. Use a given fraction to find the whole amount (reverse)
3. Find percentage of amount using non calc methods.
4. Find percentages using multipliers and calculators

Depth - Solve problems with percentages over 100% (Depth)Literacy check and assessment lesson. | 1. Literacy Pre Teach (Go Task) Know and use the vocabulary of probability. Understand use the probability scale.
2. Sample space diagrams for single events.
3. Calculate the probability of a single event
4. Know that probability sums to 1
5. Interpret and create Venn diagrams
6. Understand and use the intersection of sets.
7. Understand and use the union of sets.

*If time allows – understand and use the complement of a set. Depth* |
| **Skills**  |
| **Vocabulary** | multiples, integer, positive, zero, factor, divisible, remainder, term, factorise, divisor, prime, relationship, triangular, square, common, product, express, conjecture, proof, assumption | place, value, holder, digit, fraction, decimal, tenth, part, hundredth, percentage, equivalent, fifth, quarter, eighth, thousandth, convert, numerator, denominator, whole, quotient, operator, improper, recurring, rational, mixed | equal, congruent, divide, denominator, numerator, ascend, descend, positive, negative, unit fraction, multiple, whole, addition, subtraction, integer, partition, equivalent, common, improper, mixed, commutative | fraction, equivalent, numerator, denominator, whole, hundred, original, percent, convert, decimal, place value | universal, set, inclusive, element, member, Venn, intersection, mutually exclusive, union, complement, impossible, likely, even, certain, random, bias, event, sample, possibility, outcome, fair, scale |
| **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?** | Finding factors Finding multiples Times tables Knowledge of prime numbers Square numbers Square roots Cube numbers Cube roots Venn diagrams | Equivalence Understanding of a fractionUnderstanding of a percentage Place value of decimals Multiplying by powers of ten Timetables | Adding fractions with the same denominator Equivalent fractionsRepresentations of fractionsCommon fraction, decimal, percentage equivalence | Denominator and numeratorsDivision and multiplication FDP equivalence Sequences involving fractions  | Fraction, decimal and percentage equivalence.Know the meaning of frequency. |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes | Yes | Yes | Yes |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No | No |
| **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 |

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| **SOW** | Constructing, measuring and geometric notation | Geometric reasoning |  |  |  |
| **Knowledge** | 1. Literacy Pre Teach (Go Task) Letter and labelling conventions. Angles as a measure of turn. Classify angles.
2. Measure and draw angles up to 180.
3. Draw angles between 180 and 360. Perpendicular and parallel lines
4. Recognise triangles and quadrilaterals.
5. Identify polygons up to a decagon.
6. Construct triangles – SSS, SAS and ASA
 | 1. Literacy Pre Teach (Go Task) Angles around a point and on a straight line.
2. vertically opposite angles.
3. Angles in a triangle.
4. Angles in a quadrilateral.
5. Solve angle problems involving triangles and quadrilaterals.

*Depth Investigate angles in parallel lines. Find and use the angle sum in a polygon**Solve problems with angles involving algebra* |  |  |  |
| **Skills**  |
| **Vocabulary** | line, segment, polygon, angles, degrees, rotation, acute, obtuse, reflex, interior, exterior, protractor, construct, parallel, perpendicular, intersect, isosceles, scalene, equilateral, square, rectangle, kite, rhombus, regular, quadrilateral, parallelogram, trapezium, vertices, vertex, decagon, diagonal, compound | adjacent, vertical, opposite, intersect, convex, estimate concave, co-interior, transversal, conjecture, alternate, corresponding, proof. |  |  |  |
| **Does the knowledge above marry up with KO?** | No – need to reorder and combine topics. | No – need to reorder and combine topics. |  |  |  |
| **How does this knowledge link to/build on prior knowledge?** | Accurately use a ruler.Accurately use a protractor. Understand the meaning of hatch marks. Understand how an angle is identified with three letter notations. | Names and properties of types of triangles and quadrilaterals. Names of polygons. Angle facts relating to a full turn. |  |  |  |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes |  |  |  |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes |  |  |  |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No |  |  |  |
| **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 |