Year 6 Curriculum 2019

Reasoning about the Number System

Counting

- ***revise counting in different multiples and reasoning about this***
- ***revise counting in 0.1 and 0.01***
- ***revise counting in negative numbers***

Value of digits

- read, write numbers up to 10 000 000 and determine the value of each digit
- ***revise partitioning of numbers***
- ***revise use of < > signs and use = sign in lots of different positions***
- use negative numbers in context, and calculate intervals across zero ***e.g. temperature changes***
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- fractions into decimal equivalents and vice versa
- ***revise conversion of measures e.g. 1.5kg = 1500g, 1.25 litres =***
- ***conversion of time units and number of days in year, months***
- ***revise Roman numerals via dates***

Ordering and comparing

- order and compare numbers up to 10 000 000 and determine the value of each digit
- compare and order fractions, including fractions > 1

Rounding

- ***revise rounding numbers to 10, 100,1000, 10 000***
- ***revise rounding decimals to whole number, 1 dec place***
- round any whole number to a required degree of accuracy

Number properties

- ***revise factor pairs and factors***
- ***revise square numbers, cube numbers***
- identify common factors, common multiples and prime numbers
- ***tests of divisibility***

Problem Solving

- solve number and practical problems that involve all of the above.

Reasoning about Addition and Subtraction

- perform mental calculations, including with mixed operations and large numbers ***456 + 2999, 7 – 0.9, 4567 - 999***
- ***revise column addition of 4 and 5 digit numbers***
- ***revise column subtraction of 4 and 5 digit numbers***
- ***revise decimal addition – 4.91 + 2.376***
- ***revise decimal subtraction 8.90 – 3,456, 7 – 3.55***
- ***use the inverse to check answers***
- ***missing number problems where 2 or 3 numbers are missing in a column method***
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ***(including conversion of measures and money)***
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

Reasoning about Fractions within addition and subtraction

- ***revise addition of fractions with mixed numbers e.g 1 2/5 + 3 4/10***
- ***revise subtraction of fractions with mixed numbers e.g. 3 5/10 – 2 1/20***
- ***revise empty box problems for addition and subtraction of fractions***

- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- fractions on a pie chart

Statistics

- ***revise reading information from charts and tables to answer questions***
- ***revise time problems using a number line***
- calculate and interpret the mean as an average

Reasoning about Multiplication and Division

- ***recall all times tables facts and division facts up to 12 x***
- perform mental calculations, including with mixed operations and large numbers e.g. 540 ÷ 6, 30 x 60
- ***revise multiplying 3 numbers linked to volume and cubed numbers***
- ***revise 2 x 2, 3 x 2 multiplication using long multiplication***
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- ***area of rectanglinar shapes using formula (linked to multiplication)***
- ***area od compound shapes that can be split into rectangles***
- multiply one-digit numbers with up to two decimal places by whole numbers
- ***revise missing number problems for long and short multiplication***
- ***revise missing number problems e.g. 0.3 ÷ ? = 30***
- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- ***revise division with answers with 1 dec place***
- use written division methods in cases where the answer has up to two decimal places
- ***use commutativity to show understanding***
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy e.g with division word problems
- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- calculate and interpret the mean as an average

Reasoning about Fractions within multiplication and division

- ***revise multiplying a fraction by integer e.g. 5/6 x 540***
- ***revise multiply a mixed number by 10 or multiple of 10 e.g. 1 3/5 x 10***
- multiply simple pairs of proper fractions, writing the answer in its simplest form
- associate a fraction with division and calculate decimal fraction equivalents
- divide proper fractions by whole numbers

Statistics

- ***revise reading information from charts and tables to answer questions***
- ***revise reading pictograms and interpreting them***

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Reasoning about Fractions including decimals
Also see addition, subtraction, multiplication and division

- solve problems with fractions and decimals
- solve problems which require answers to be rounded to specified degrees of accuracy

Reasoning about Measures

- ***revise reading scales on variety of measuring equipment***
- ***revise reading timetables and time puzzles***

- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places

- convert between miles and kilometres

- recognise that shapes with the same areas can have different perimeters and vice versa

- recognise when it is possible to use formulae for area and volume of shapes

- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].

Reasoning about Geometry – properties of shape
3-D Shape

- ***revise properties of all 3-D shapes***
- recognise, describe and build simple 3-D shapes, including making nets
- calculate volume of cubes and cuboids

Angles

- ***revise use of protractor to measure angles on straight line and lines at different orientations***
- ***revise how to measure angles in different orientations***

• recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

2-D shape

- ***revise basic properties of parallelogram, kite, rhombus, trapezium, including angle properties, parallel and perpendicular lines, irregular quadrilaterals, symmetry***
- ***calculate the area of parallelograms***
- ***revise how to calculate the perimeter of shapes and how to find the perimeter where not all the information is given***

• draw 2-D shapes using given dimensions and angles, ***including through the use of co-ordinates where one is missing, where two of three sides are given on a triangle etc***

• ***revise properties of triangles*** and calculate the area of triangles

• compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

• illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius

Geometry – position and direction

• describe positions on the full coordinate grid (all four quadrants) ***include missing sides of shapes, plotting shapes and plotting points, annotating diagrams***

• draw and translate simple shapes on the coordinate plane, and reflect them in the axes

Reasoning about Ratio and Proportion

• solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts

- ***revise finding1%, 10%,50% of a number or quantity***

• solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison

• solve problems involving similar shapes where the scale factor is known or can be found - ***link to area/perimeter***

• solve problems involving unequal sharing and grouping using knowledge of fractions and multiples ***– link to x and division***

Reasoning about Algebra

• use simple formulae – area /volume/perimeter

• generate and describe linear number sequences ***e.g. what comes next in this sequence 4,8,16,32,… why ?***

• express missing number problems algebraically
e.g. 2a = 30 what is a? 2c + t = 36 if t = 6 what is c?

• find pairs of numbers that satisfy an equation with two unknowns ***e.g. if 2a + b = 10 and a and b are both less than 10 what are my options***

•enumerate possibilities of combinations of two variables

Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as:

•missing numbers, lengths, coordinates and angles
• formulae in mathematics and science
•equivalent expressions (for example, a + b = b + a)
•generalisations of number patterns
• number puzzles (for example, what two numbers can add up to).

Reasoning about Statistics

• interpret and construct pie charts and line graphs and use these to solve problems *(link to % and fractions)*

• calculate and interpret the mean as an average