ST. DUNSTAN'S

End of Year Expectations

Maths

Year 5

Please note that the objectives are not necessarily taught in the order listed below.

The National Curriculum for mathematics aims to ensure that all pupils:

- *become fluent in the fundamentals of mathematics, so that pupils have conceptual understanding and can recall and apply their knowledge rapidly and accurately to problems.*
- *reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument or proof using mathematical language.*
- *can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.*

Learning Objectives	Additional information
Number and Place Value	
Read, write, order and compare numbers to at least 1000000 and determine the value of each digit. Interpret negative numbers in context. Count forwards and backwards with positive and negative whole numbers including through zero.	Large numbers of six digits are named in a pattern of three: hundreds of thousands, tens of thousands, ones of thousands, mirroring hundreds, tens and ones. It is helpful to relate large numbers to real-world contexts, for example the number of people that a local sports arena can hold.
Addition and Subtraction	
Add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction). Add and subtract numbers mentally with increasingly large numbers (e.g. 12462 – 2300 = 10162). Solve problems involving numbers up to three decimal places.	Before starting any calculation is it helpful to think about whether or not you are confident that you can do it mentally. For example, 3689 + 4998 may be done mentally, but 3689 + 4756 may require paper and pencil. Carrying out an equivalent calculation might be easier than carrying out the given calculation. For example 3682 – 2996 is equivalent to 3686 – 3000 (constant difference).
Multiplication and Division	
Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Multiply numbers up to four digits by a 1 or 2-digit number using a formal written method, including long multiplication for 2-digit numbers. Multiply and divide numbers mentally drawing upon known facts. Divide numbers up to four digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}). Solve problems involving multiplication and division. Use knowledge of factors and multiples, squares and cubes. Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.	Pupils have a firm understanding of what multiplication and division mean and have a range of strategies for dealing with large numbers, including both mental and standard written methods. They see the idea of factors, multiples and prime numbers as connected and not separate ideas to learn. They recognise how to use their skills of multiplying and dividing in new problem solving situations. Fractions and division are connected ideas: 36 ÷ 18= 36/18 36/18 = 2 Factors and multiples are connected ideas: 48 is a multiple of 6 and 6 is a factor of 48
Fractions	

Compare and order fractions whose denominators are multiples of the same number. Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (for example, 2/5 + 4/5 = 6/5 = 1 1/5). Add and subtract fractions with the same denominator and denominators that are multiples of the same number. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'. Write percentages as a fraction with denominator 100, and as a decimal. Read and write decimal numbers as fractions [e.g 0.71 = 71/100]. Solve problems which require knowing percentage and decimal equivalents of 1/ 2 , 1/ 4 , 1 /5 , 2/ 5 , 4/ 5 and those fractions with a denominator of a multiple of 10 or 25.	Representations that may appear different sometimes have similar underlying ideas. For example 1/4, 0·25 and 25% are used in different contexts but are all connected to the same idea.
Decimals	
Read, write, order and compare numbers with up to three decimal places. Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Round decimals with two decimal places to the nearest whole number and to one decimal place. Solve problems involving number up to three decimal places. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	
Percentages	
Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'. Write percentages as a fraction with denominator 100, and as a decimal. Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5, and those fractions with a denominator of a multiple of 10 or 25.	
Measurement	
Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre). Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.	The relationship between area and perimeter is not a simple one. Increasing or decreasing area does not necessarily mean the perimeter increases or decreases respectively, or vice versa. Area is measured in square units. For rectangles, measuring the length and breadth is a shortcut to finding out how many squares would fit into each of these dimensions.

Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) Estimate the area of irregular shapes.	
Geometry	
Identify 3-D shapes, including cubes and other cuboids, from 2-D representations know angles are measured in degrees. Estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees (°) Identify: • angles at a point and one whole turn (total 360°) • angles at a point on a straight line and 1/2 a turn (total 180°) • other multiples of 90 ° Use the properties of rectangles to deduce related facts and find missing lengths and angles. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	During this year, pupils increase the range of 2-D and 3-D shapes that they are familiar with. With 3-D shapes they think about the faces as well as the number of vertices and through considering nets think about the 2-D shapes that define the 3-D shapes. Pupils learn about a range of angle facts and use them to describe certain shapes and derive facts about them. Regular shapes have to have all sides and all angles the same. Although non-square rectangles have four equal angles, the fact that they do not have four equal sides means that they are not regular. Some properties of shapes are dependent upon other properties. For example, a rectangle has opposite sides equal because it has four right angles. A rectangle is defined as a quadrilateral with four right angles. It does not have to be defined as a quadrilateral with four right angles and two pairs of equal sides.
Statistics	
Solve comparison, sum and difference problems using information presented in a line graph. Complete, read and interpret information in tables, including timetables.	Different representations highlight different aspects of data. It is important to be able to answer questions about data using inference and deduction, not just direct retrieval.