

Y10 Unit 1 Overview-Number skills and Shape:

Test window: WB 4th November 2019

Target grade for tests:

You will learn about:

- Numbers and the number system (HCF, LCM, prime numbers powers and roots)
- Accuracy and estimating
- Calculating
- The importance of performing operations in the correct order
- Properties of shapes

You will be able to:

- Recognise prime numbers, factors, multiples, common factors, common multiples, HCF and LCM
- Evaluate powers and roots and recognise powers of 2, 3, 4, 5
- Recognise and using sequences of triangular, square and cube numbers and simple arithmetic progressions
- Order positive and negative integers, decimals and fractions and use the symbols =, ≠, <, >, ≤, ≥
- Apply the four operations to integers and decimals
- Round numbers and measuring to an appropriate degree of accuracy
- Estimate answers; checking calculations using approximation, including answers from the calculator
- Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres
- Recognise properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles using appropriate language



Lesson Overview

NUMBERS AND THE NUMBER SYSTEM

- Recall prime numbers up to 50
- Know how to test if a number up to 150 is prime
- Know the meaning of 'highest common factor' and 'lowest common multiple'
- Recognise when a problem involves using the HCF or LCM of two numbers
- Understand the use of notation for powers
- Know the meaning of the square root symbol ($\sqrt{\quad}$)
- Use a scientific calculator to calculate powers and roots
- Make the connection between squares and square roots (and cubes and cube roots)
- Identify the first 10 triangular numbers
- Recall the first 15 square numbers
- Recall the first 5 cube numbers
- Use linear number patterns to solve problems

COUNTING AND COMPARING

- Place a set of negative numbers in order
- Place a set of mixed positive and negative numbers in order
- Identify a common denominator that can be used to order a set of fractions
- Order fractions where the denominators are not multiples of each other
- Order a set of numbers including a mixture of fractions, decimals and negative numbers
- Use inequality symbols to compare numbers
- Make correct use of the symbols = and \neq

CALCULATING

- Use knowledge of place value to multiply with decimals
- Use knowledge of place value to divide a decimal
- Use knowledge of place value to divide by a decimal
- Use knowledge of inverse operations when dividing with decimals
- Be fluent at multiplying a three-digit or a two-digit number by a two-digit number
- Be fluent when using the method of short division

Key Words

Refer to

<http://studymaths.co.uk/glossary.php>

for definitions of the key words

Lowest common multiple and LCM

Highest common factor and HCF

Power

Square and cube root

Triangular number, Square number, Cube number,

Prime number

Linear sequence

Notation

Index notation: e.g. 5^3 is read as '5 to the power of 3' and means '3 lots of 5 multiplied together'

$\sqrt{49}$ is generally read as 'the square root of 49' and means 'the positive square root of 49'; $\sqrt[3]{8}$ means 'the cube root of 8'

Positive number/ Negative number

Integer

Numerator/ Denominator

Notation

The 'equals' sign: =

The 'not equal' sign: \neq

The inequality symbols: < (less than), > (greater than), \leq (less than or equal to), \geq (more than or equal)

Improper fraction (top-heavy fraction)

Mixed number

Operation

Inverse

Long multiplication

Remainder

Approximate (noun and verb)

Round

Decimal place

Check

Solution

- Know the order of operations for the four operations
- Use brackets in problem involving the order of operations

CHECKING, APPROXIMATING AND ESTIMATING

- Approximate by rounding to any number of decimal places
- Know how to identify the first significant figure in any number
- Approximate by rounding to the first significant figure in any number
- Use estimation to predict the size of the solution to a (decimal) calculation
- Estimate calculations by rounding numbers to one significant figure
- Use cancellation to simplify calculations
- Use inverse operations to check solutions to calculations

INVESTIGATING PROPERTIES OF SHAPES

- Know the vocabulary of 3D shapes
- Know the connection between faces, edges and vertices in 3D shapes
- Visualise a 3D shape from its net
- Recall the names and shapes of special triangles and quadrilaterals
- Know the meaning of a diagonal of a polygon
- Know the properties of the special quadrilaterals (including diagonals)
- Apply the properties of triangles to solve problems
- Apply the properties of quadrilaterals to solve problems

Answer
 Estimate (noun and verb)
 Order of magnitude
 Accurate, Accuracy
 Significant figure
 Cancel
 Inverse
 Operation

Notation
 The approximately equal symbol (\approx)
 Significant figure is abbreviated to 's.f.' or 'sig fig'

Face, Edge, Vertex (Vertices)
 Cube, Cuboid, Prism, Cylinder, Pyramid, Cone, Sphere
 Quadrilateral
 Square, Rectangle, Parallelogram, (Isosceles)
 Trapezium, Kite, Rhombus
 Delta, Arrowhead
 Diagonal
 Perpendicular
 Parallel
 Scalene, Right-angled, Isosceles, Equilateral

Notation
 Dash notation to represent equal lengths in shapes and geometric diagrams

Suggested reading or support/ challenge available

Cross curricular
SMSC:
 1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of calculation.
 3.1 Developing personal qualities and using social skills (regular paired/ group work communication).
 3.2 Participating, cooperating and resolving conflicts (paired/group activities).
 4.2 Experiencing fascination, awe and wonder of mathematics.
 4.4 Using imagination and creativity in learning.
Literacy:
 Verbal communication of understanding using key words in the correct context. Development of written communication of methods and strategies to problem solve.
NAC:
Science – Estimation. Round whole numbers and decimals. Order, add and subtract negative numbers. Use significant figures. Use standard form. Use formulae involving negative numbers. Use a calculator efficiently. Substitution into Scientific formulae, Rearrange formulae.
Business – Use formulae involving negative numbers.
MFL – Mental and written calculations with whole numbers and decimals. Use a calculator efficiently.
R.E. - Estimation.
P.E. - Round whole numbers and decimals.
Geography -. Estimation. Round whole numbers and decimals. Use a calculator efficiently.
Creative Arts - Estimation. Round whole numbers and decimals. Use a calculator efficiently.

Research	Note-making	Group work & discussion	Memorisation	Precision & accuracy	Independence	Reflection

