Y7 Unit 3 Overview - Shape: Measures and Transformations

Test window: 16th March 2020 - 27th March 2020

Target grade for tests:

You will learn about:

- Rounding and approximation
- Area, Perimeter and Volume
- Transformations: reflections and translations

You will be able to:

- Round numbers to a specified degree of accuracy.
- Use estimation to check answers to calculations.
- Recognise that shapes with the same areas can have different perimeters and vice versa.
- Calculate the area of parallelograms and triangles.
- Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].
- Recognise when it is possible to use formulae for area and volume of shape.
- Solve problems involving the calculation and conversion of units of measure.
- Plot and interpret coordinates in all four quadrants.
- Draw and translate simple shapes and reflect them in the x and y axes.
- Use and convert between standard units of length, mass, volume and time.

Lesson Overview

CHECKING, APPROXIMATING AND ESTIMATING

- Approximate any number by rounding to the nearest 1 000 000
- Approximate any number by rounding to a specified degree of accuracy; e.g. nearest 20, 50
- Understand estimating as the process of finding a rough value of an answer or calculation
- Use estimation to predict the order of magnitude of the solution to a (decimal) calculation
- Check the order of magnitude of the solution to a (decimal) calculation
- Estimate multiplication calculations that involve multiplying up to four-digit numbers by a two-digit number
- Estimate division calculations that involve dividing up to a four-digit number by a two-digit number
- Estimate multiplication calculations that involve multiplying numbers with up to two decimal places by whole numbers

AREA, PERIMETER AND VOLUME

- Recognise that shapes with the same areas can have different perimeters and vice versa
- Know that the area of a parallelogram is given by the formula area = base × height
- Know that the area of a triangle is given by the formula area = ½ × base × height = base × height ÷ 2 = $\frac{bh}{2}$
- Know that the volume of a cuboid is given by the formula volume = length × width × height
- Calculate the area of a parallelogram (triangle)
- Recognise when it is possible to use a formula for the area of a shape
- Estimate the volume of cubes and cuboids
- Choose appropriate units of volume
- Calculate the volume of a cuboid
- Recognise when it is possible to use a formula for the volume of a shape
- Convert between metric units of area and volume in simple cases

Key Words

Refer to http://studymaths.co.uk/glossary.php for definitions of the key words

Approximate (noun and verb)
Round
Decimal place
Check
Solution
Answer
Estimate (noun and verb)
Order of magnitude
Accurate, Accuracy

Notation
The approximately equal symbol (≈)

Perimeter, area, volume, capacity
Square, rectangle, parallelogram, triangle
Composite rectilinear
Polygon
Cube, cuboid
Millimetre, Centimetre, Metre, Kilometre
Square millimetre, square centimetre, square metre, square kilometre
Cubic centimetre, centimetre cube
Formula, formulae
Convert
Length, breadth, depth, height, width

Notation
Abbreviations of units in the metric system: km, m, cm, mm, mm^2, cm^2, m^2, km^2, mm^3, cm^3, km^3

2-D, Grid, Point
Axis, axes, x-axis, y-axis
Origin

TRANSFORMATIONS: REFLECTION AND TRANSLATIONS

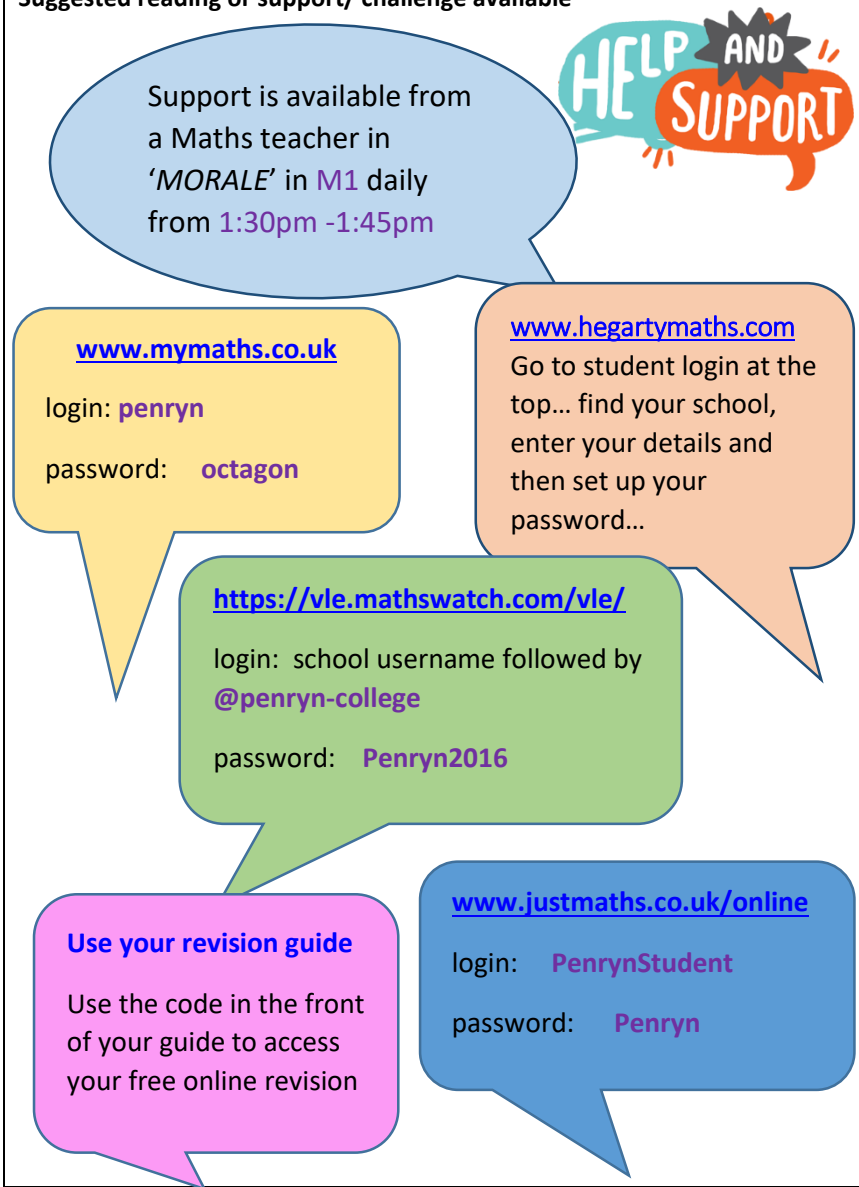
- Use coordinates to describe the position of a point in all four quadrants
- Use coordinates to write the position of a point in all four quadrants
- Construct a 2-D coordinate grid (all four quadrants)
- Use coordinates to plot the position of a point in any of the four quadrants
- Use coordinates to plot a set of points to construct a polygon
- Solve problems involving coordinates
- Carry out a translation
- Carry out a reflection using one of the axes as a mirror line

MEASURING SPACE

- Convert between non-adjacent metric units; e.g. kilometres and centimetres
- Use decimal notation up to three decimal places when converting metric units
- Convert between Imperial units; e.g. feet and inches, pounds and ounces, pints and gallons
- Solve problems involving converting between measures
- State conclusions using the correct notation and units

Quadrant
(Cartesian) coordinates (x,y)
Translation, Reflection, Transformation
Object, Image
Congruent, congruence
Length, distance
Mass, weight
Volume, Capacity
Metre, centimetre, millimetre
Tonne, kilogram, gram, milligram
Litre, millilitre
Hour, minute, second
Inch, foot, yard
Pound, ounce
Pint, gallon
Notation
Abbreviations of units in the metric system: m, cm, mm, kg, g, l, ml
Abbreviations of units in the Imperial system: lb, oz

Suggested reading or support/ challenge available



Cross curricular

SMSC:
1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of multiplication (Chinese, Russian).
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 – Round numbers to the nearest 10, 100 or 1000. Estimate and check answers using approximations. Use the formulae for the volume of a cuboid. Use co-ordinates in the first quadrant. Convert one metric unit to another. Use metric units of length, capacity, mass and time.
Creative arts – Use metric units of length, capacity, mass and time.
Technology - Estimate and check answers using approximations. Know rough metric/imperial equivalence of common units. Convert one metric unit to another. Use metric units of length, capacity, mass and time.
PE - Round numbers to the nearest 10, 100 or 1000. Use metric units of length, capacity, mass and time.

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