

Y9 Unit 3 Overview - Shape: Measures and Transformations

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

Target grade for tests:

You will learn about:

- Transform shapes
- Units of measurement
- Area, Perimeter and Volume

You will be able to:

- Plot coordinates in four quadrants.
- Know equations of vertical and horizontal lines.
- Reflect, rotate and translate shapes using the correct vocabulary.
- Use and change between standard units of measure (length, area, volume/capacity, mass, time, money, etc.) including compound measures e.g. speed.
- Measure lines and angles in geometric shapes.
- Calculate perimeters of 2D shapes.
- Know and use formulae to calculate area of triangles, parallelograms and trapezia.
- Calculate surface area of cuboids.
- Know and use formulae to calculate volume of cuboids.



Lesson Overview

MATHEMATICAL MOVEMENT- TRANSFORMATIONS

- Write the equation of a line parallel to the x-axis or the y-axis
- Draw a line parallel to the x-axis or the y-axis given its equation
- Identify the lines $y = x$ and $y = -x$
- Draw the lines $y = x$ and $y = -x$
- Carry out a reflection in a diagonal mirror line (45° from horizontal)
- Find and name the equation of the mirror line for a given reflection
- Describe a translation as a 2D vector
- Understand the concept and language of rotations
- Carry out a rotation using a given angle, direction and centre of rotation
- Describe a rotation using mathematical language

MEASURING SPACE

- Use a ruler to accurately measure line segments to the nearest millimetre
- Use a protractor to accurately measure angles to the nearest degree
- Convert fluently between metric units of length
- Convert fluently between metric units of mass
- Convert fluently between metric units of volume / capacity
- Convert fluently between units of time
- Convert fluently between units of money
- Solve practical problems that involve converting between units
- State conclusions clearly using the units correctly

CALCULATING SPACE

- Recognise that the value of the perimeter can equal the value of area
- Use standard formulae for area and volume
- Find missing lengths in 2D shapes when the area is known
- Know that the area of a trapezium is given by the formula $\text{area} = \frac{1}{2} \times (a + b) \times h = \left(\frac{a+b}{2}\right) h = \frac{(a+b)h}{2}$
- Calculate the area of a trapezium
- Understand the meaning of surface area
- Find the surface area of cuboids (including cubes) when lengths are known
- Find missing lengths in 3D shapes when the volume or surface area is known

Key Words

Refer to

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

for definitions of the key words

(Cartesian) coordinates

Axis, axes, x-axis, y-axis

Origin

Quadrant

Translation, Reflection, Rotation

Transformation

Object, Image

Congruent, congruence

Mirror line

Vector

Centre of rotation

Notation

Cartesian coordinates should be separated by a comma and enclosed in brackets (x, y)

Vector notation $\begin{pmatrix} a \\ b \end{pmatrix}$ where a = movement right and b = movement up

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

Line segment

Notation

Abbreviations of units in the metric system:


m, cm, mm, kg, g, l, ml

Abbreviations of units in the Imperial system:

lb, oz

Research		<p>Perimeter, area, volume, capacity, surface area</p> <p>Square, rectangle, parallelogram, triangle, trapezium (trapezia)</p> <p>Polygon</p> <p>Cube, cuboid</p> <p>Square millimetre, square centimetre, square metre, square kilometre</p> <p>Cubic centimetre, centimetre cube</p> <p>Formula, formulae</p> <p>Length, breadth, depth, height, width</p> <p>Notation</p> <p>Abbreviations of units in the metric system: km, m, cm, mm, mm², cm², m², km², mm³, cm³, km³</p>
Note-making		
Group work & discussion		
Memorisation		
Precision & accuracy		
Independence		
Reflection		

Suggested reading or support/ challenge available



Support is available from a Maths teacher in 'MORALE' in M1 daily from 1:30pm -1:45pm

www.mymaths.co.uk

login: **penryn**

password: **octagon**

www.hegartymaths.com

Go to student login at the top... find your school, enter your details and then set up your password...

<https://vle.mathswatch.com/vle/>

login: school username followed by **@penryn-college**

password: **Penryn2016**

Use your revision guide

Use the code in the front of your guide to access your free online revision

www.justmaths.co.uk/online

login: **PenrynStudent**

password: **Penryn**

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 – Find areas by counting squares. Measure and read scales using appropriate units and accuracy. Convert one metric unit to another. Use metric units of length, capacity, mass and time. Use the formulae for the volume of a cuboid. Use standard formulae for area and volume.

MFL - Know rough metric/imperial equivalence of common units.

Technology - Measure and read scales using appropriate units and accuracy. Know rough metric/imperial equivalence of common units. Convert one metric unit to another. Use metric units of length, capacity, mass and time.

Business - Measure and read scales using appropriate units and accuracy.

Creative arts – Use metric units of length, capacity, mass and time.

PE - Use metric units of length, capacity, mass and time.