Y9 Unit 3 Overview- Shape

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

Target grade for tests:

You will learn about:

- Using constructions to solve problems
- Calculating with circles
- Calculate surface areas of prisms
- Pythagoras' theorem

You will be able to:

- Construct the perpendicular bisector of a line segment, perpendicular to a given line from and at a given point, bisect a given angle.
- Use constructions to solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line.
- Construct plans and elevations of 3D shapes.
- Identify and apply circle definitions and properties, including: tangent, arc, sector and segment.
- Calculate arc lengths, angles and areas of sectors of circles.
- Calculate surface area of right prisms (including cylinders).
- Calculate exactly with multiples of π.
- Know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$, and apply it to find lengths in right-angled triangles in two dimensional figures.

Lesson Overview

VISUALISING AND CONSTRUCTING

- Use compasses to construct clean arcs
- Use ruler and compasses to construct the perpendicular bisector of a line segment
- Use ruler and compasses to bisect an angle
- Use a ruler and compasses to construct a perpendicular to a line from a point (at a point)
- Understand the meaning of locus (loci)
- Know how to construct the locus of points a fixed distance from a point (from a line)
- Identify when to use the locus of points a fixed distance from a point (from a line)
- Identify when a perpendicular bisector is needed to solve a loci problem
- Identify when an angle bisector is needed to solve a loci problem
- Choose techniques to construct 2D shapes; e.g. rhombus
- Combine techniques to solve more complex loci problems
- Know how to deal with a change in depth when dealing with plans and elevations
- Construct a shape from its plans and elevations
- Construct the plan and elevations of a given shape

CALCULATING SPACE

- Know the vocabulary of circles
- Know how to find arc length
- Calculate the arc length of a sector when radius is given
- Know how to find the area of a sector
- Calculate the area of a sector when radius is given
- Calculate the angle of a sector when the arc length and radius are known
- Know how to find the surface area of a right prism (cylinder)
- Calculate the surface area of a right prism (cylinder)
- Calculate exactly with multiples of π
- Know Pythagoras' theorem

Key Words

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

Compasses
Arc
Line segment
Perpendicular
Bisect
Perpendicular bisector
Locus, Loci
Plan
Elevation
Circle, Pi

Radius, diameter, chord, circumference, arc, tangent, sector, segment
(Right) prism, cylinder
Cross-section
Hypotenuse
Pythagoras' theorem

Notation

π
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

CALCULATING SPACE (continued)

- Identify the hypotenuse in a right-angled triangle
- Know when to apply Pythagoras' theorem
- Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem
- Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem

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 – Mathematical names of 3-D shapes. Make simple 3-D models from nets. Recognise 2-D representations of 3-D shapes. Use co-ordinates in the first Quadrant. Understand angle as a measure of turn. Measure and draw angles.
Technology- Make simple 3-D models from nets.
Art – Mathematical names of 3-D shapes.

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