Problem of the Week: Week 4 (Sum2): Year 7: Geometry

- Use the properties of the faces, surface, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D
- Derive and apply formulae to calculate the volume of cubes and cuboids.

Which is the odd one out?

Look at the three solid shapes and think about their different properties.

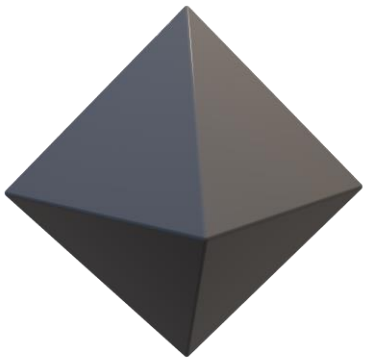
Think about how many faces, edges and vertices they have.

Think about what shape each face is.

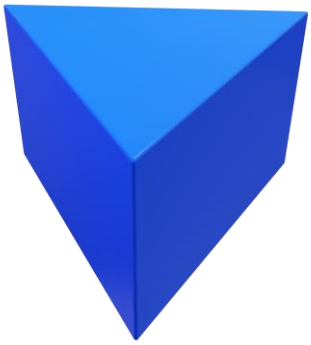
Choose one shape as the odd one out.

For the other two shapes, write down what is the same about them and how they are different from the first shape.

Repeat this for all three shapes, so that each one is the odd one out in some way.



Octahedron



Triangular Prism

Cone

Examples

Odd one out = Octahedron

The other two are the same in some way because they both have less than 6 faces

Odd one out = Cone

The other two are the same in some way because they both have some triangular faces

Odd one out = Triangular prism

The other two are the same in some way because neither has a uniform cross-section (a ‘slice’)

Fill the gaps

Fill in the missing spaces in the table

Name of 3-D shape	Faces	Edges	Vertices
Tetrahedron	4	6	4
Cuboid	6	12	8
Square based pyramid	5	8	5
Pentagonal based pyramid	6	10	6
Hexagonal prism	8	18	12

The volume of cubes and cuboids

We know that to find the volume of any cuboid we use the following formula

Length x width x height = volume (units^3)

Find the length, width and height of a **cube** with a volume of 125 cm^3

Volume = 125 cm^3

Length = 5cm

Width = 5cm

Height = 5cm

A cuboid has a volume of 192 cm^3

What could the dimensions be?

Find at least four different cuboids

How many more can you find?

Length x width x height = 192 cm^3			
length	**width**	**height**	**volume**
1cm	1cm	192cm	192 cm^3
2cm	2cm	48cm	192 cm^3
6cm	4cm	8cm	192 cm^3
8cm	3cm	8cm	192 cm^3
16cm	3cm	4cm	192 cm^3