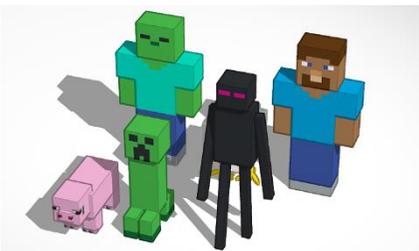
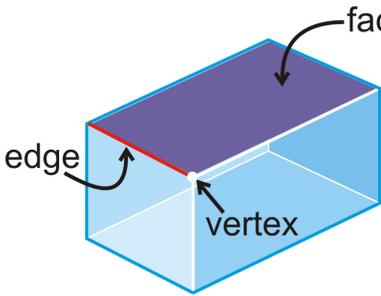


Year 5 - Mathematics - Learn from home timetable

Big Idea Concept: 3 D Shapes

Australian Curriculum Connection: Connect three-dimensional objects with their nets and other two-dimensional representations

Monday	Tuesday	Wednesday	Thursday	Friday
<p align="center">Launch and Tune In</p> <p>Go on a 3D shape hunt around you house. Draw what you see.</p>	<p align="center">Launch and Tune In</p> <p>What 3D shapes can you find outside?</p>	<p align="center">Launch and Tune In</p> <p>Using some boxes or recycled materials can you design a new character for Minecraft? What 3D shapes make up his physique?</p>   	<p align="center">Launch and Tune In</p> <p>Challenge: What is the difference between a cuboid and a rectangular prism? -What are the similarities?</p>	<p align="center">Launch and Tune In</p> <p>List all the 3D shapes you can and name them. How many Vertices does each shape have?</p> 

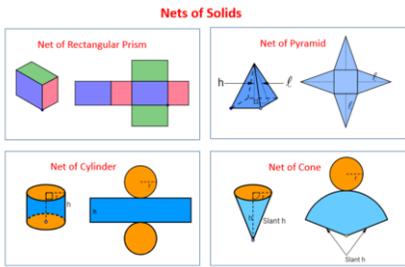
Vocabulary in Mathematics

Students should be able to communicate using the following language: object, shape, three-dimensional object (3D object), prism, cube, pyramid, **base**, **uniform cross-section**, face, edge, vertex (vertices), **apex**, top view, front view, side view, depth, net.

In earlier year levels, students were introduced to the terms 'flat surface' and 'curved surface' for use in describing cones, cylinders and spheres, and the terms 'faces', 'edges' and 'vertices' for use in describing prisms and pyramids.

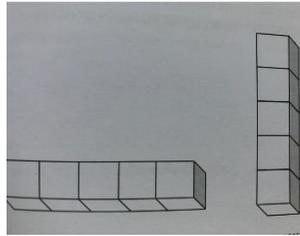
<p align="center">Conceptual Development</p> <p>Students explore a 3D shape from the recycled materials (cereal boxes are great!) and allow them to predict what the net of that shape will look like. The net is a 2-dimensional shape that can be</p>	<p align="center">Conceptual Development</p> <p>Your task is to design and draw as many shapes as you can with 5 multi-links cubes. The first one has been drawn for you below, from 2 different orientations. Be aware that this is still the same shape.</p>	<p align="center">Conceptual Development</p> <p>Check your students understanding by asking:</p> <ul style="list-style-type: none"> -What is a NET? -What is a face? 	<p align="center">Conceptual Development</p> <p>3D shape Challenge: Face Shapes: How many 3D shapes can you find that have at least one:</p> <ul style="list-style-type: none"> -Square face: -Triangular Face: -Round Face: 	<p align="center">Conceptual Development</p> <p>A company is trying to decide on new packaging for its lollies. They want a standard 3D shape but are unsure of which one to pick. The packaging must not be more than 12cm high, 9cm wide or 7cm long. The package must contain at least</p>
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folded to form a 3-dimensional **shape** or a solid



3. Allow students to cut open a variety of shaped boxes, cartons and containers. This is a good introduction to 3D shapes and their nets, alternatively use 3D shapes that have the net inside to allow students to see one representation of a net for a 3D shape.

Combination 1: Drawn from 2 different orientations



Draw the different combinations you can make?

-How many combinations have you found?

-What patterns or strategies did you use to make sure that you had found all of the different combinations and to ensure that you hadn't repeated any while drawing them?

Challenge: If there was one less block, how many different combinations would there be? Why do you think this is so different to 5 blocks?

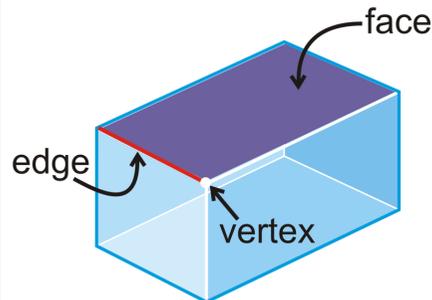
-What is an edge?

-What is a vertices?

-Can you name some 3D shapes?

-How many Faces, Vertices and Edges does this shape have? (Use the chart attached to assist).

Check students understanding that a Geometry Net is a flattened out three dimensional solid (a three dimensional shape) -- like a cube, a prism or a pyramid. When you cut out the "net", fold it and glue it together you can see what the three dimensional shape looks like. A three-dimensional shape is called three dimensional (or 3D) because it has three dimensions: length, width and height. The two most common measurements we need for a three-dimensional shape is: volume: for example, how much water it would hold and surface area: for example, how much area you would have to paint to cover the entire outside of the shape.



-Rectangular Face:

Lines and Angles:

How many 3D shapes can you find that have at least one:

-Right angle:

-Acute Angle:

-Obtuse angle:

Type of Angle	Description	Example
Acute Angle	An angle that is less than 90°	
Right Angle	An angle that is exactly 90°	
Obtuse Angle	An angle that is greater than 90° and less than 180°	

Challenge:

Most 3D objects are a combination of numerous different 3D shapes. Your job is to find as many 3D objects that you can that contain at least one:

-Rectangular Prism

-Triangular Prism

-Pyramid or Cone

-Cylinder

100 jelly beans. Your job is to: design two packages with different shapes, draw the 3D packages, draw the 2D nets. How can you reason that your package would hold 100 jelly beans?

Tips:

What are your design requirements?

What different shapes could you try? Draw them and work out their dimensions. Don't forget: you need to find 2 different shapes that work for your design.

What pattern did you find between using the two different shapes?

Prisms have two bases that are the same shape and size. The bases of a prism may be squares, rectangles, triangles or other polygons. The other faces are rectangular if the faces are perpendicular to the bases. The base of a prism is the shape of the uniform cross-section, not necessarily the face on which it is resting.

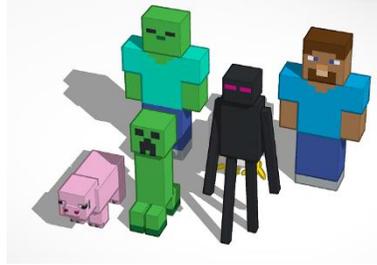
Pyramids differ from prisms as they have only one base and all the other faces are triangular. The triangular faces meet at a common vertex (the apex). Pyramids do not have a uniform cross-section.

Spheres, cones and cylinders do not fit into the classification of prisms or pyramids as they have curved surfaces, not faces, eg a cylinder has two flat surfaces and one curved surface.

- Draw and label as many 3 D shapes as you can.

Consider the 3D shapes you have been learning about. Draw a design of a new Minecraft character using 5 of the 3 D shapes.

- List and label the 3D shapes on your design.



- Step Inside Task:
- Draw and name a 3D shape.
- What would you notice if you were to step inside this shape?
- Complete the attached template.

Draw your ideas for working out the Problem-Solving Task- Paint it.

Using your list of 3D shapes from the Launch earlier can you draw an example of each shape in the real world?

Problem Solving and Reasoning: Paint It!

The student studies patterns by analyzing the number of sides painted of each unit cube, which made up the larger painted cube.



Case 1



Case 2



Case 3



Case 4

Imagine that we paint a $4 \times 4 \times 4$ cube blue on every side. How many of the small cubes have 3 blue faces?

How many have 2 blue faces?

How many have 1 blue face?

How many have not been painted at all? How many faces would be painted in a cube of any size? Think visually!

Materials which may assist

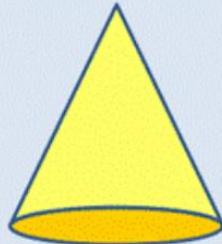
Grid paper

Centimeter cubes or similar (sugar cubes or any boxes which are a cube are great for this activity!)

Colored pens or markers

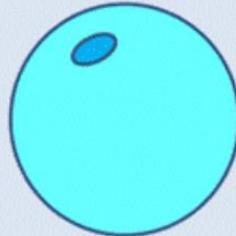
Properties of 3D shapes

Cone



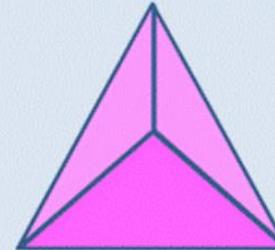
2 Faces
1 Edge
1 Vertex

Sphere



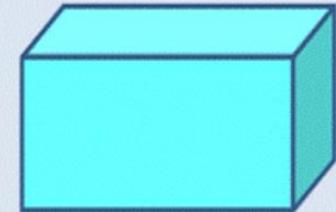
1 Face
1 Edge
0 Vertices

Tetrahedron



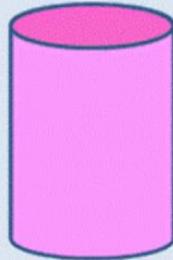
4 Faces
6 Edges
4 Vertices

Cuboid



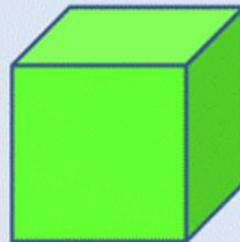
6 Faces
12 Edges
8 Vertices

Cylinder



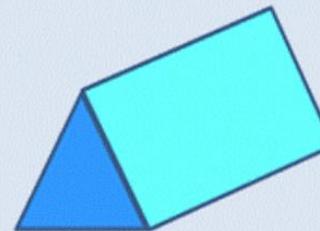
3 Faces
2 Edges
0 Vertices

Cube



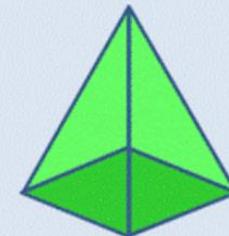
6 Faces
12 Edges
8 Vertices

Triangular Prism



5 Faces
9 Edges
6 Vertices

Square-based pyramid



5 Faces
8 Edges
5 Vertices

What can the person see, observe, or notice?

What might the person or thing know, understand, hold true or believe?

Step Inside:

What might the person or thing care deeply about?

What might the person or thing wonder about or question?