Welcome to your free sample of PlanBee's **Let's Explore 3-D Shapes** scheme of work!

This is Lesson 1 in a series of 5 lessons.

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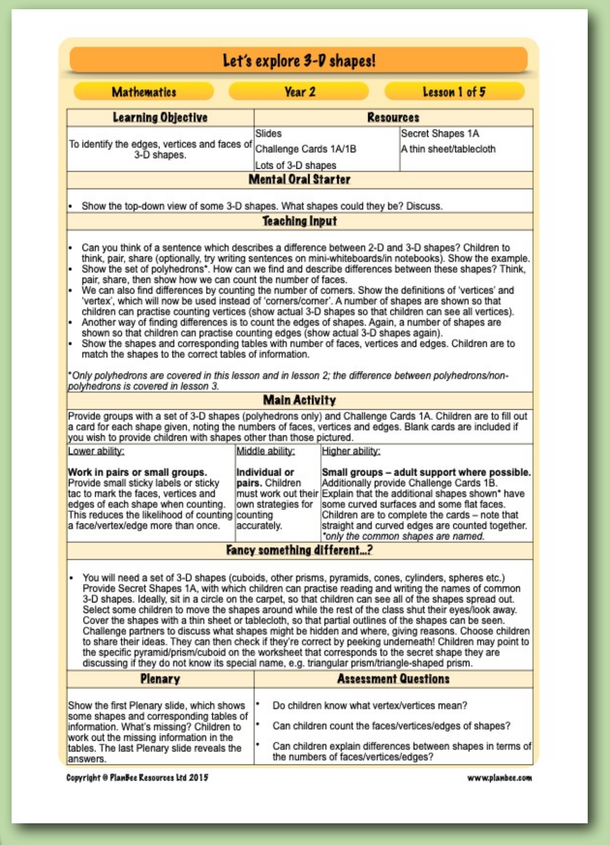
Like all PlanBee lessons, this lesson pack contains a detailed lesson plan, slideshow presentation and a range of printable resources:



Let's explore 3-D shapes!

Mathematics	Year 2	Lesson 1 of 5

Learning Objective	Resources	
To identify the edges, vertices and faces of 3-D shapes.	Slides Challenge Cards 1A/1B Lots of 3-D shapes	Secret Shapes 1A A thin sheet/tablecloth

Mental Oral Starter

- Show the top-down view of some 3-D shapes. What shapes could they be? Discuss.

Teaching Input

- Can you think of a sentence which describes a difference between 2-D and 3-D shapes? Children to think, pair, share (optionally, try writing sentences on mini-whiteboards/in notebooks). Show the example.
- Show the set of polyhedrons*. How can we find and describe differences between these shapes? Think, pair, share, then show how we can count the number of faces.
- We can also find differences by counting the number of corners. Show the definitions of 'vertices' and 'vertex', which will now be used instead of 'corners/corner'. A number of shapes are shown so that children can practise counting vertices (show actual 3-D shapes so that children can see all vertices).
- Another way of finding differences is to count the edges of shapes. Again, a number of shapes are shown so that children can practise counting edges (show actual 3-D shapes again).
- Show the shapes and corresponding tables with number of faces, vertices and edges. Children are to match the shapes to the correct tables of information.

**Only polyhedrons are covered in this lesson and in lesson 2; the difference between polyhedrons/non-polyhedrons is covered in lesson 3.*

Main Activity

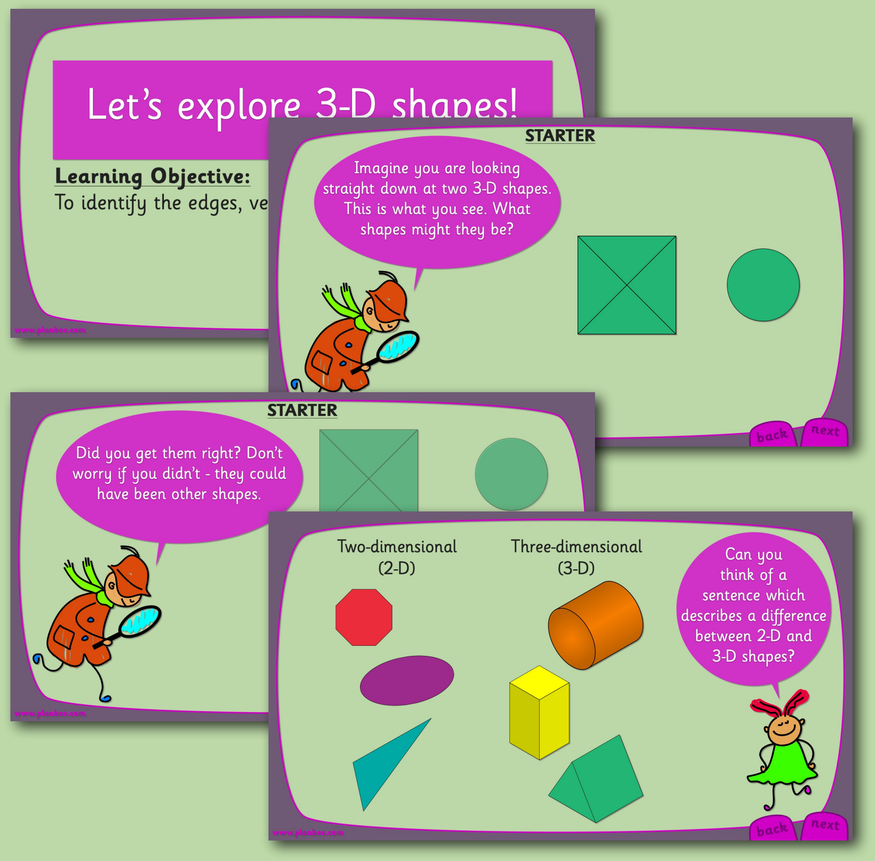
Provide groups with a set of 3-D shapes (polyhedrons only) and Challenge Cards 1A. Children are to fill out a card for each shape given, noting the numbers of faces, vertices and edges. Blank cards are included if you wish to provide children with shapes other than those pictured.

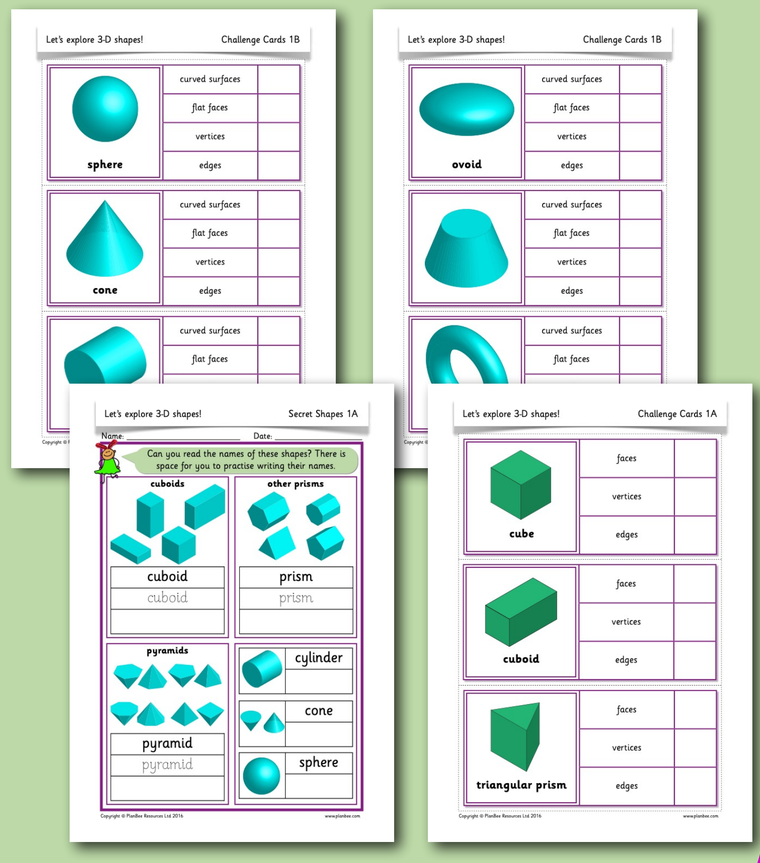
Lower ability:	Middle ability:	Higher ability:
Work in pairs or small groups. Provide small sticky labels or sticky tac to mark the faces, vertices and edges of each shape when counting. This reduces the likelihood of counting a face/vertex/edge more than once.	**Individual or pairs.** Children must work out their own strategies for counting accurately.	**Small groups – adult support where possible.** Additionally provide Challenge Cards 1B. Explain that the additional shapes shown* have some curved surfaces and some flat faces. Children are to complete the cards – note that straight and curved edges are counted together. **only the common shapes are named.*

Fancy something different...?

- You will need a set of 3-D shapes (cuboids, other prisms, pyramids, cones, cylinders, spheres etc.) Provide Secret Shapes 1A, with which children can practise reading and writing the names of common 3-D shapes. Ideally, sit in a circle on the carpet, so that children can see all of the shapes spread out. Select some children to move the shapes around while the rest of the class shut their eyes/look away. Cover the shapes with a thin sheet or tablecloth, so that partial outlines of the shapes can be seen. Challenge partners to discuss what shapes might be hidden and where, giving reasons. Choose children to share their ideas. They can then check if they're correct by peeking underneath! Children may point to the specific pyramid/prism/cuboid on the worksheet that corresponds to the secret shape they are discussing if they do not know its special name, e.g. triangular prism/triangle-shaped prism.

Plenary	Assessment Questions
Show the first Plenary slide, which shows some shapes and corresponding tables of information. What's missing? Children to work out the missing information in the tables. The last Plenary slide reveals the answers.	• Do children know what vertex/vertices mean? • Can children count the faces/vertices/edges of shapes? • Can children explain differences between shapes in terms of the numbers of faces/vertices/edges?





(This page shows just a small preview of the resources included)

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Scroll through the next slides for a preview of the slideshow presentation for this lesson…

Open in Adobe Reader, then go to View > Full Screen Mode to view as a slideshow

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Let's explore 3-D shapes!

Learning Objective:

To identify the edges, vertices and faces of 3-D shapes.

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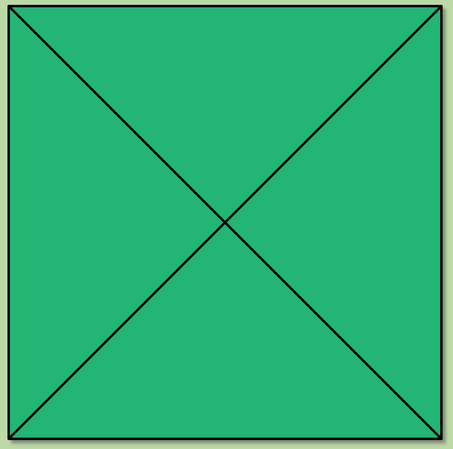
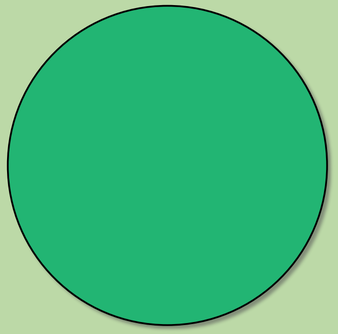
STARTER

Imagine you are looking straight down at two 3-D shapes. This is what you see. What shapes might they be?





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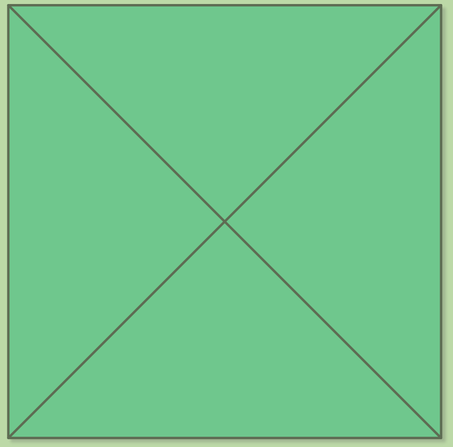
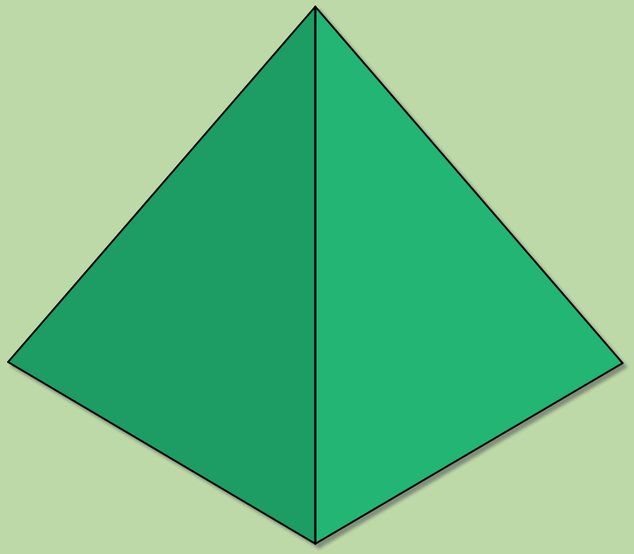
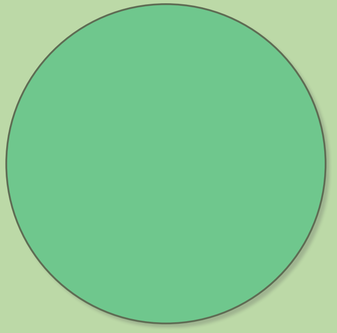
STARTER

Did you get them right? Don't worry if you didn't - they could have been other shapes.

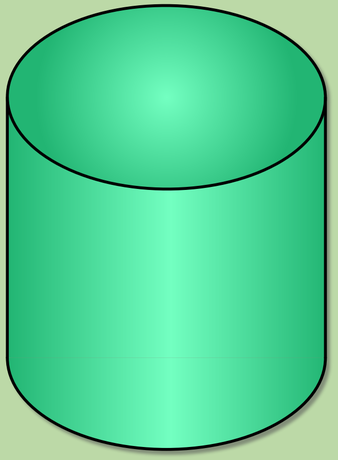


square-based pyramid

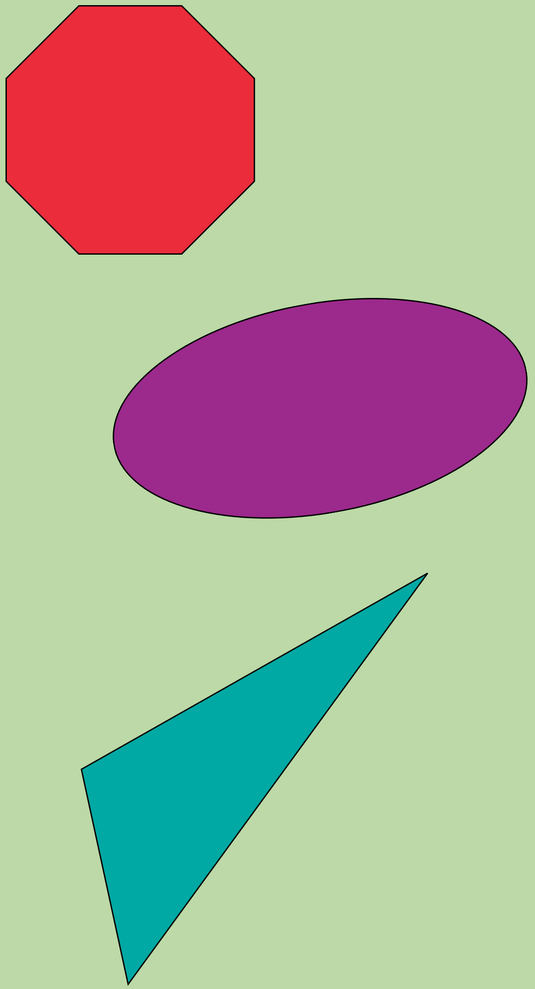




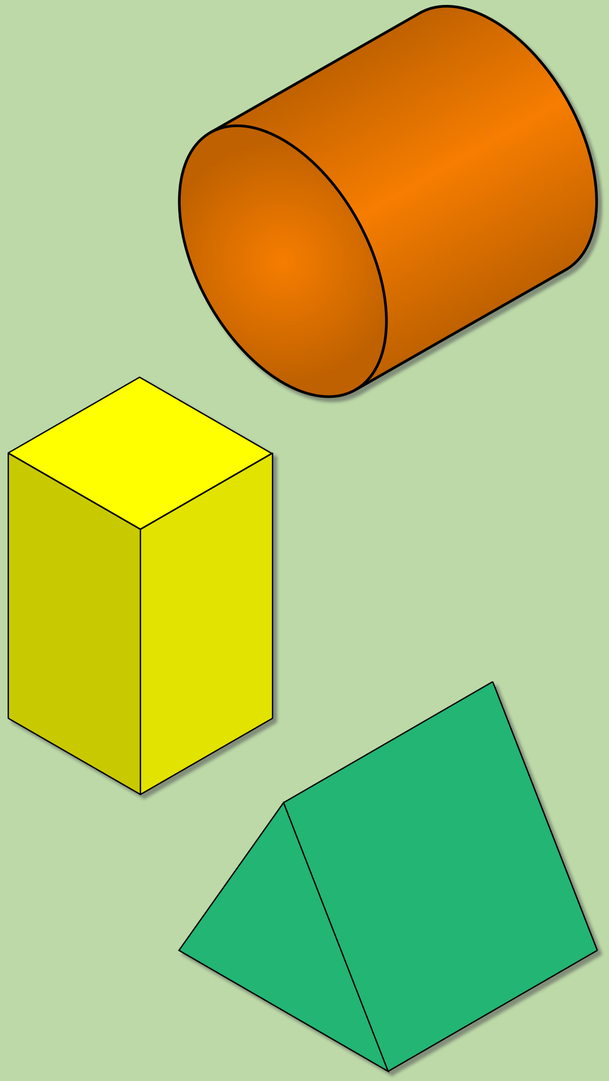
cylinder



Two-dimensional (2-D)



Three-dimensional (3-D)



Can you think of a sentence which describes a difference between 2-D and 3-D shapes?

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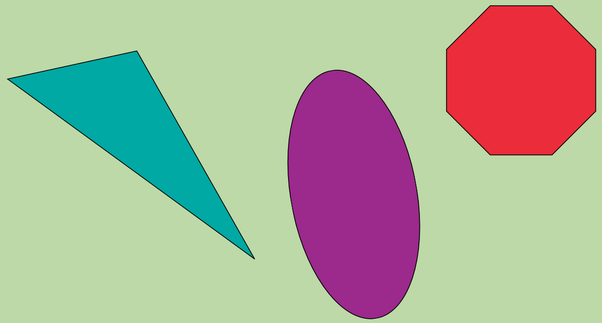
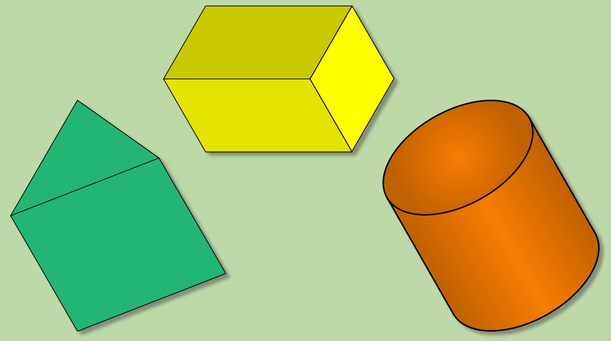
Was your sentence anything like this?

2-D shapes are flat and 3-D shapes are solid.

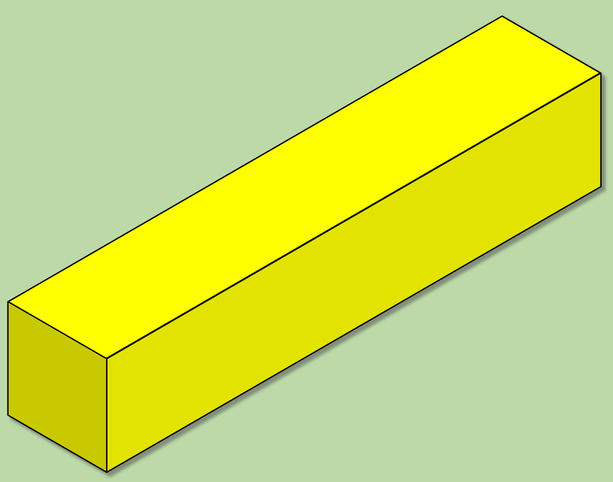


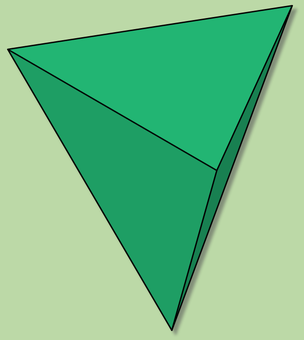
flat

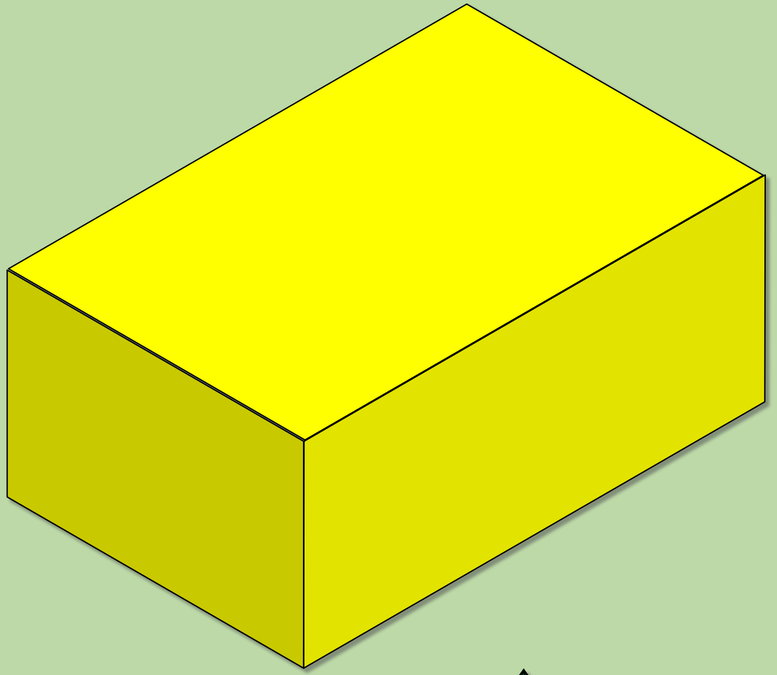


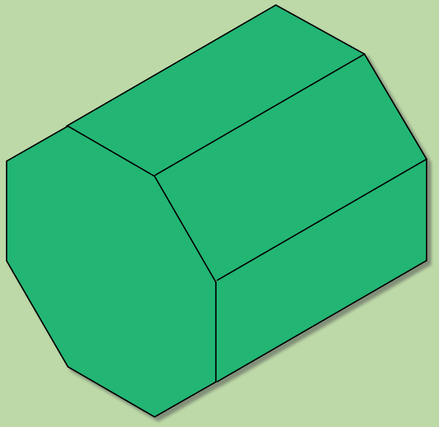
solid

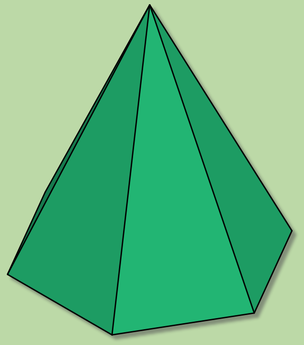
How could we find and describe differences between these shapes?

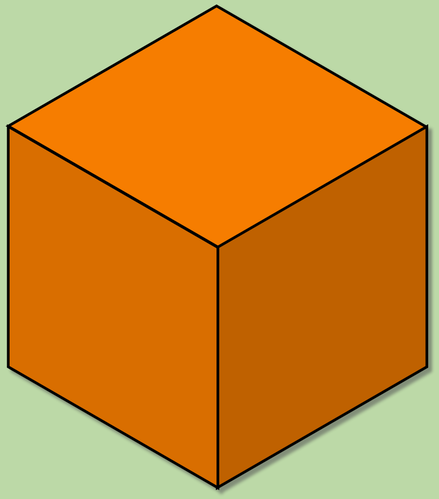


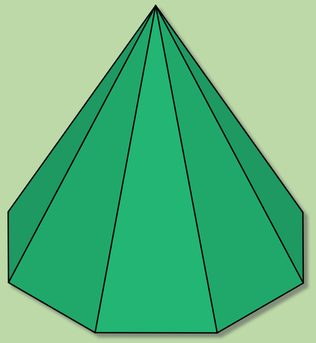


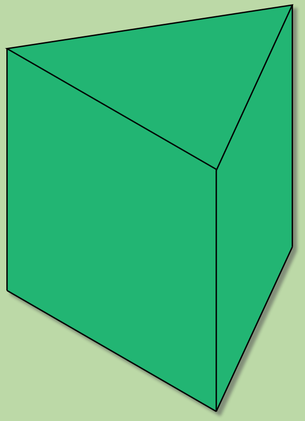












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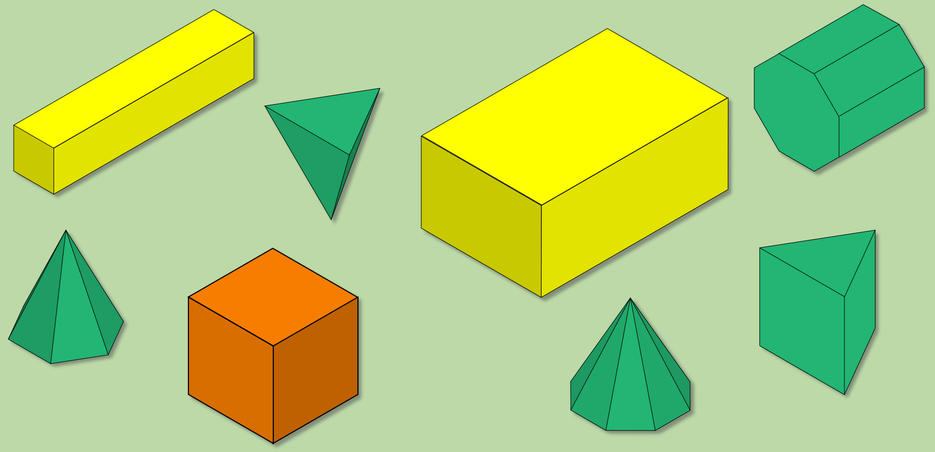
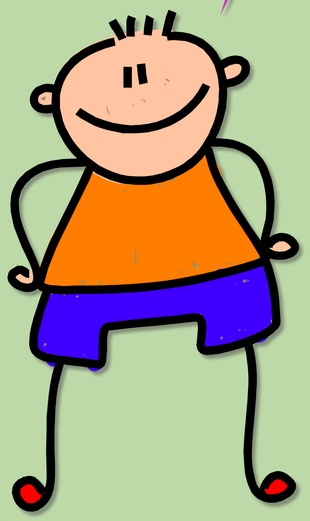
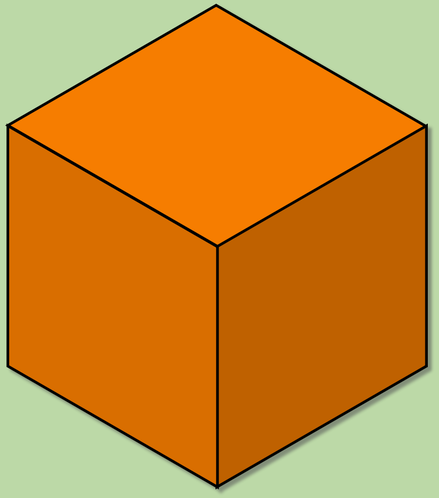
You might have thought of lots of ways of finding and describing differences between these shapes. Here's one way:



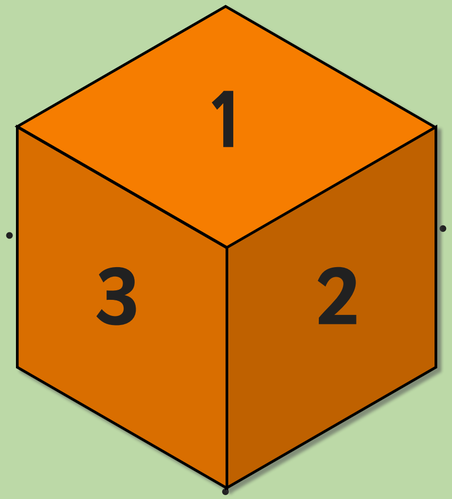
These shapes all have **flat faces**. We can count the number of flat faces shapes have.





How many flat faces does a cube have?

Cubes have six faces.



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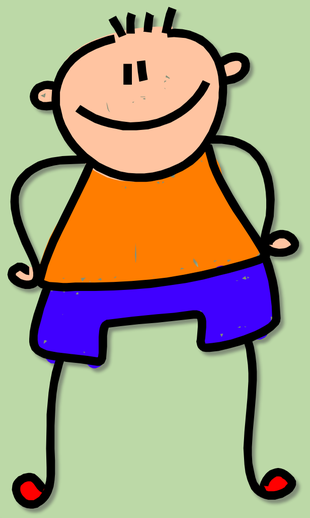
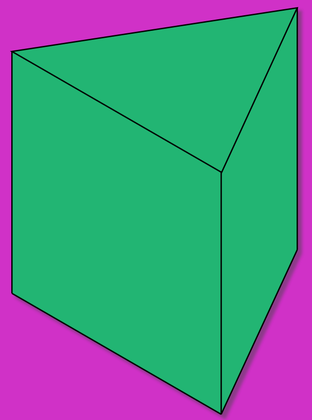


Did you get it right?



This triangular prism is different to the cube because it has a different number of faces.

How many faces does it have?

Does it have more or fewer faces than a cube?

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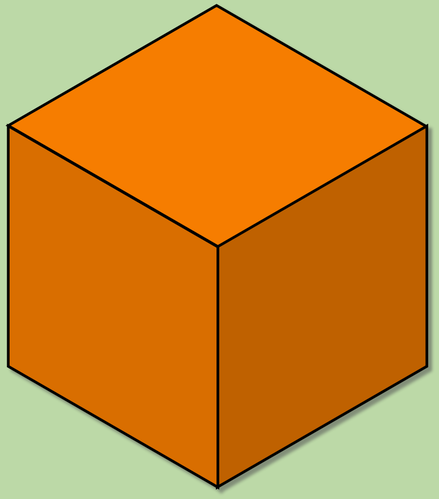
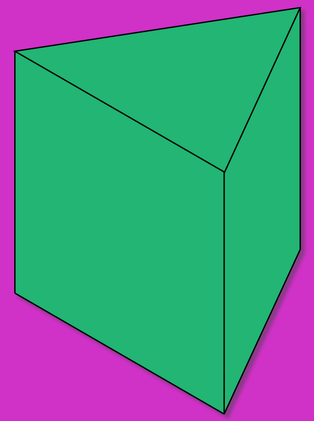
We can also find differences between shapes by counting the corners. The mathematical name for corners of shapes is **vertices**.



corner = **vertex**

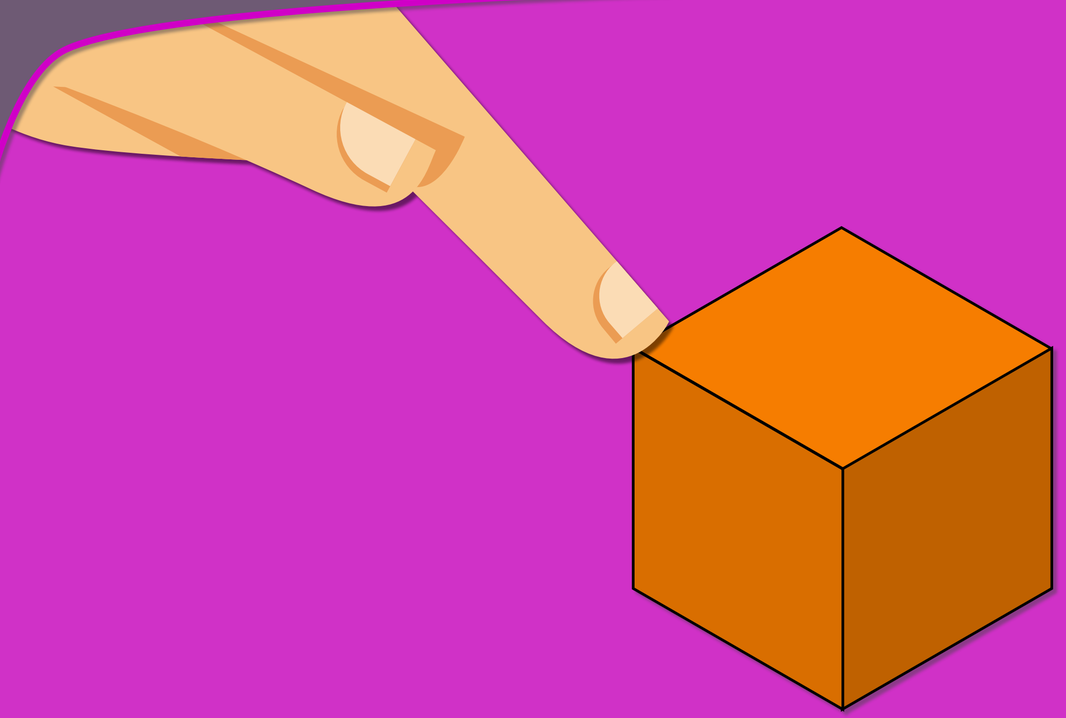
corners = **vertices**

How many **vertices** do cubes have?

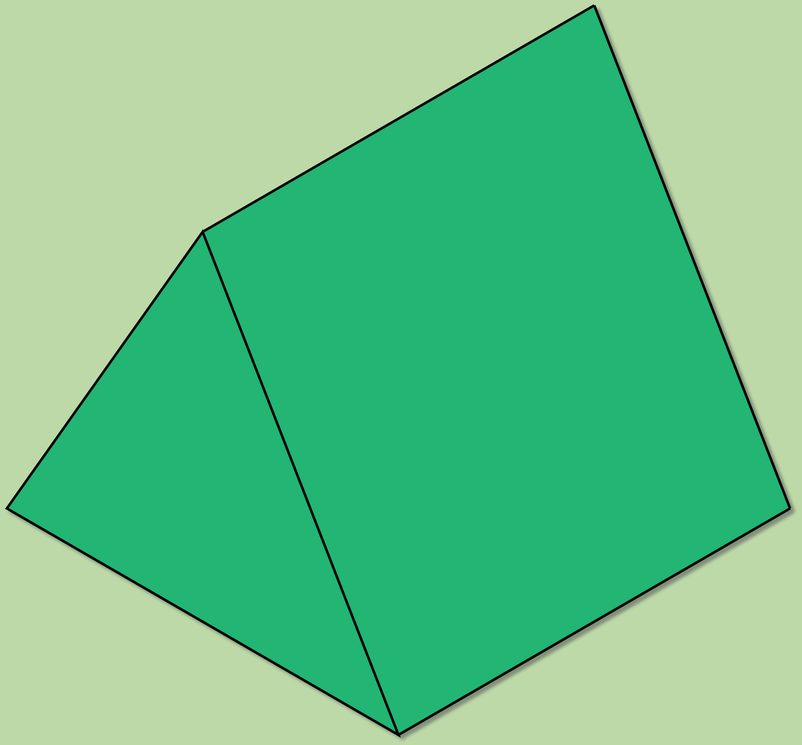


Triangular prisms have five faces.

It has one fewer face than a cube.



Cubes have eight vertices. One way you could check is by putting a finger on each vertex. You might need a friend to help you!



How many vertices does a triangular prism have?

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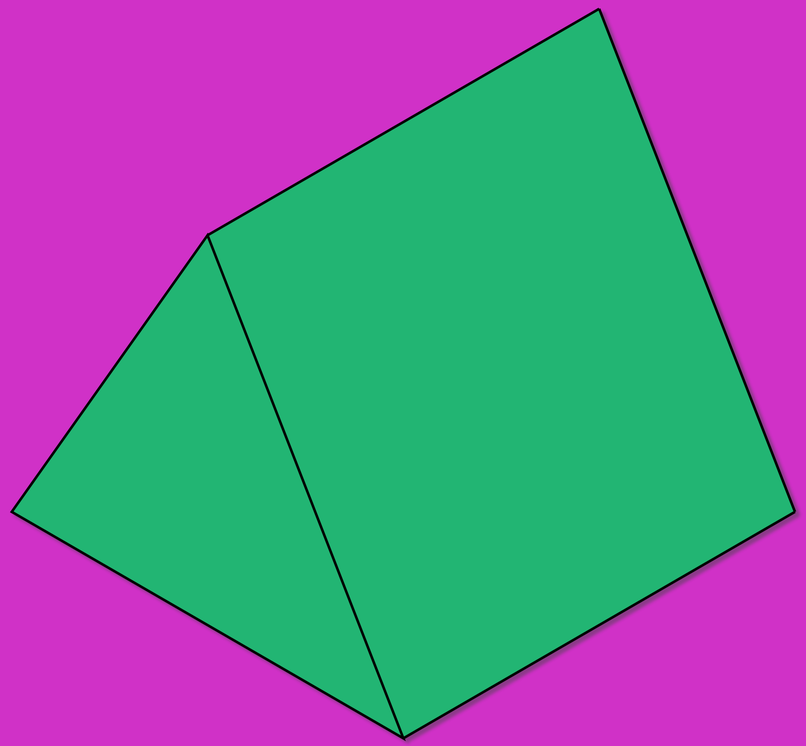
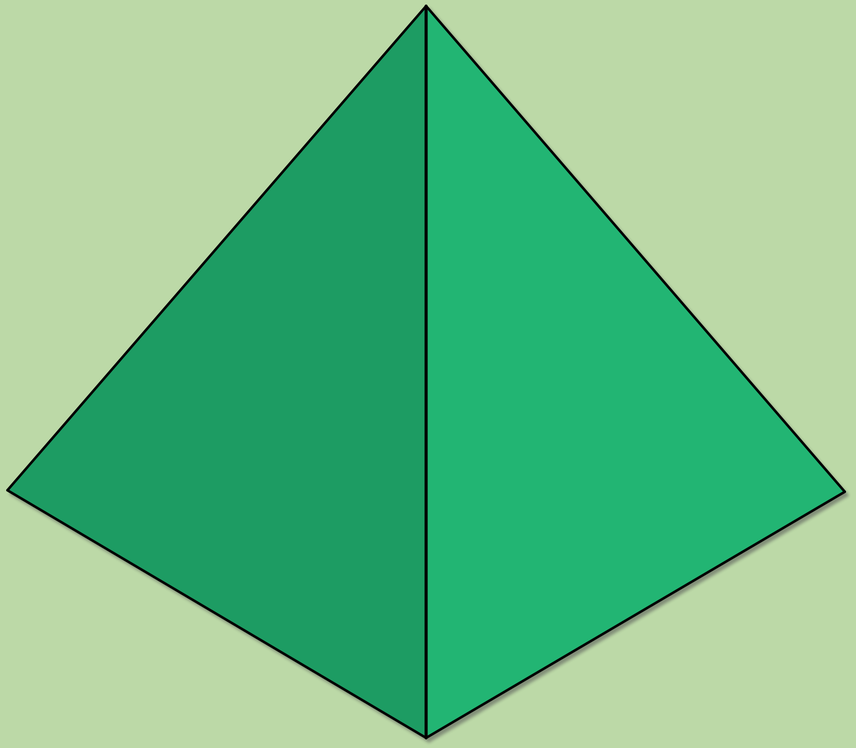


Triangular prisms have six vertices.



How many vertices does a square-based pyramid have?

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