Discussion Problems
Step 9: Reasoning about 3D Shapes

National Curriculum Objectives:

Mathematics Year 5: (5G3b) Identify 3-D shapes, including cubes and other cuboids, from 2-D representations

About this resource:

This resource has been designed for pupils who understand the concepts within this step. It provides pupils with more opportunities to enhance their reasoning and problem solving skills through more challenging problems. Pupils can work in pairs or small groups to discuss with each other about how best to tackle the problem, as there is often more than one answer or more than one way to work through the problem.

There may be various answers for each problem. Where this is the case, we have provided one example answer to guide discussion.

We recommend self or peer marking using the answer page provided to promote discussion and self-correction.

More Year 5 Properties of Shapes resources.

Did you like this resource? Don't forget to review it on our website.

Reasoning about 3D Shapes

1. Theresa thinks she has found a theory linked to 3D shapes.
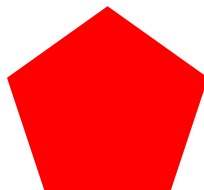
She says,

> When converting a 2D shape into a 3D prism or pyramid, the number of faces will be 2 greater than the number of sides of the 2D shape.

Is she correct? Use your knowledge of 3D nets to prove or disprove her theory.

DP

2. Explore how many different nets you could create using the shapes below.

You can use each shape a maximum of twelve times for each net.

Not drawn to scale

DP

Reasoning about 3D Shapes

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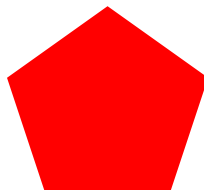**Theresa's theory is correct for prisms but not for pyramids, which are only one greater. For example:**
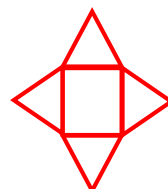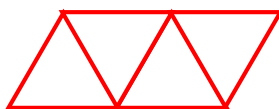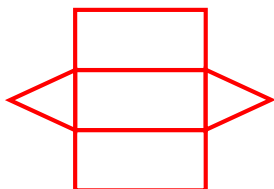
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Not drawn to scale

There are 9 shapes in total which could be made: cube, cuboid, triangular prism, pentagonal prism, triangular based pyramid, square based pyramid, pentagonal based pyramid, octahedron, dodecahedron.

DP