Reasoning and Problem Solving
Step 11: Nets of 3D Shapes

National Curriculum Objectives:

Mathematics Year 6: (6G3b) Recognise and build simple 3-D shapes, including making nets
Mathematics Year 6: (6G2b) Describe simple 3-D shapes
Mathematics Year 6: (6G2a) Compare and classify geometric shapes based on their properties and sizes

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Find and explain the mistakes in nets of 3D shapes (simple cuboids and pyramids). Includes two nets.
Expected Find and explain the mistakes in nets of 3D shapes (prisms, pyramids, truncated pyramids, cones and cylinders). Includes three nets.
Greater Depth Find and explain the mistakes in nets of 3D shapes (complex, compound shapes). Includes three nets.

Questions 2, 5 and 8 (Problem Solving)
Developing Complete the net of a 3D shape (simple cuboids and pyramids). One face missing.
Expected Complete the net of a 3D shape (prisms, pyramids, truncated pyramids, cones and cylinders). More than one face missing.
Greater Depth Complete the net of a 3D shape (complex, compound shapes). Only one face provided.

Questions 3, 6 and 9 (Reasoning)
Developing Explain if a statement about a 3D shape (simple cuboids and pyramids) is correct.
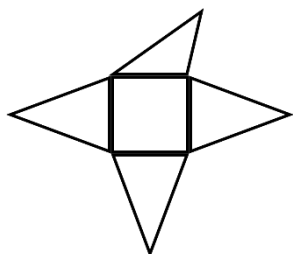Expected Explain if a statement about a 3D shape (prisms, pyramids, truncated pyramids, cones and cuboids) is correct.
Greater Depth Explain if a statement about a 3D shape (complex, compound shapes) is correct.
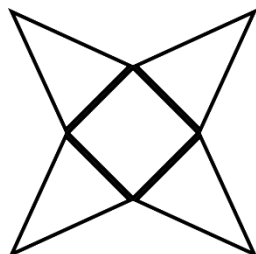
More Year 6 Properties of Shapes resources.

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

Nets of 3D Shapes

Nets of 3D Shapes

1a. Ben and Chloe have made nets of a square-based pyramid. Check which nets would work and explain any mistakes which have been made.
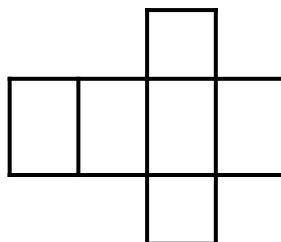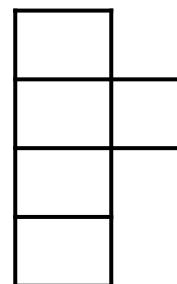
Ben   **Chloe**

D   R

1b. Rosie and Lucas have made nets of a cuboid. Check which nets would work and explain any mistakes which have been made.

Rosie   **Lucas**

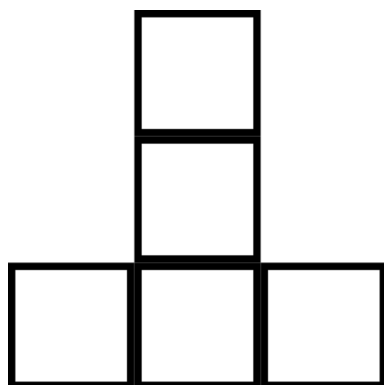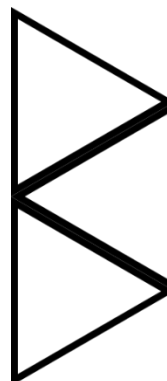D   R

2a. Lily has not been able to finish this net of a cube. Complete the net for her.

D   PS

2b. Len has not been able to finish this net of a triangular-based pyramid. Complete the net for him.

D   PS

3a. Karl is thinking about 3D shapes.

I will always need a square to make a cuboid.

Is he correct? Explain your answer.

D   R

3b. Kristen is thinking about 3D shapes.

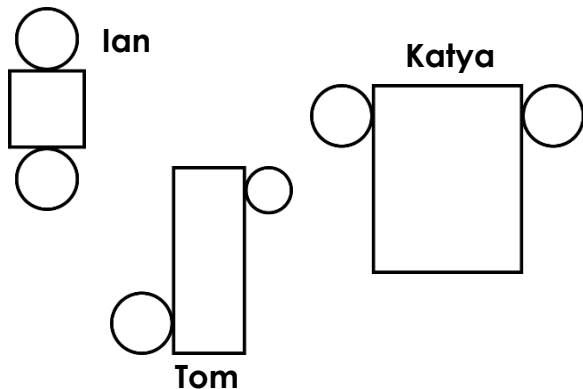I will always need four triangles to make a square-based pyramid.

Is she correct? Explain your answer.

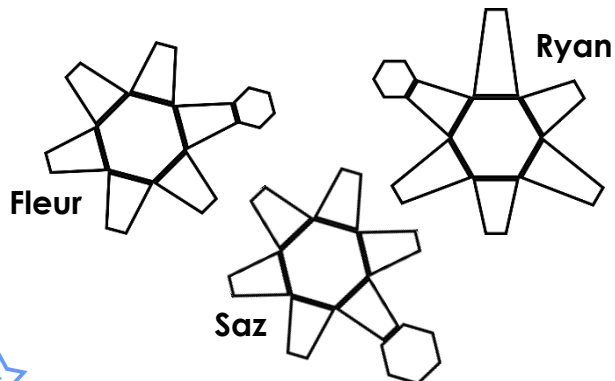D   R

Nets of 3D Shapes

Nets of 3D Shapes

4a. Ian, Katya and Tom have made nets of a cylinder. Check which nets would work and explain any mistakes which have been made.
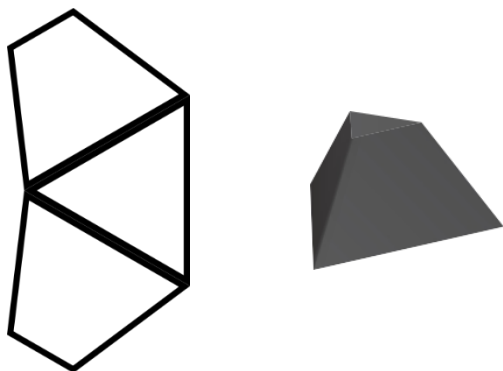
Ian

Katya

Tom

4b. Ryan, Fleur and Saz have made nets of a truncated hexagonal-based pyramid. Check which nets would work and explain any mistakes which have been made.
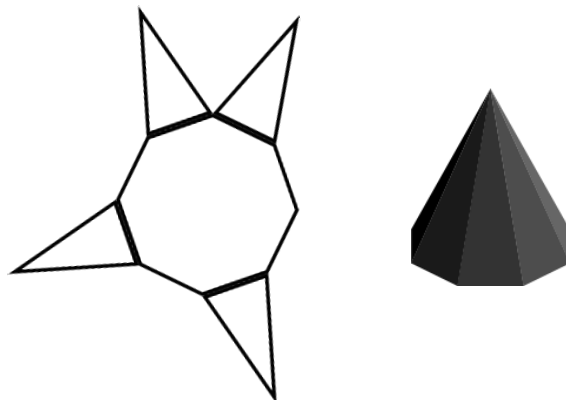
Ryan

Fleur

Saz

5a. Doug has not been able to finish this net of a truncated triangular-based pyramid. Complete the net for him.

5b. Tonya has not been able to finish this net of an octagonal-based pyramid. Complete the net for her.

6a. Leia is thinking about 3D shapes.

> I will always need a sector of a circle to make a circular-based cone.

Is she correct? Explain your answer.

6b. Marshall is thinking about 3D shapes.

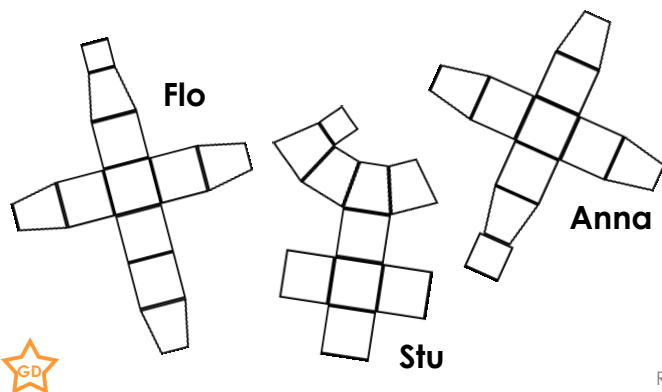> I will always need an equilateral triangle to make a pentagonal-based pyramid.
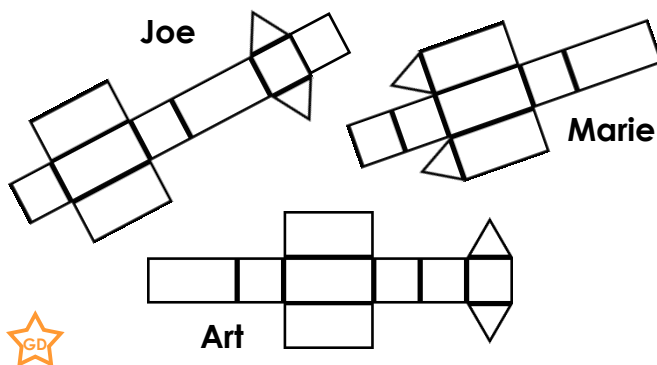
Is he correct? Explain your answer.

7a. Flo, Anna and Stu have made nets of a cube with a truncated square-based pyramid on top. Check which nets would work and explain any mistakes which have been made.
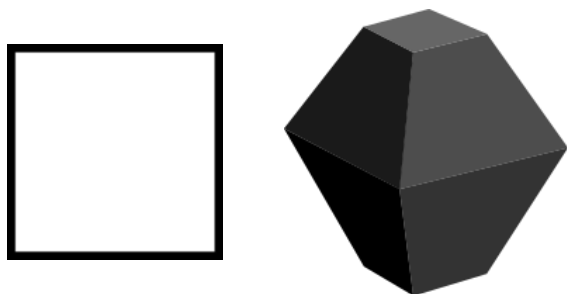
Flo

Anna

Stu

7b. Joe, Marie and Art have made nets of a cuboid with a triangular prism on one of the smaller ends. Check which nets would work and explain any mistakes which have been made.
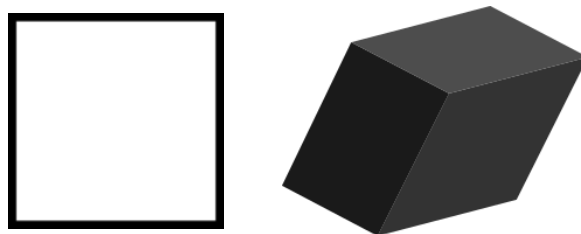
Joe

Marie

Art

8a. Nicki has only drawn the base for a net of this 3D shape. Complete the net for her.

8b. Jon has only drawn the base for a net of this 3D shape. Complete the net for him.

9a. Rohit is thinking about 3D shapes.

I will always need eight isosceles triangles to make an octahedron.

Is he correct? Explain your answer.

9b. Azania is thinking about 3D shapes.

I will always need a pair of regular heptagons to make a heptagonal prism.
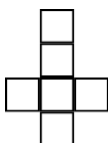
Is she correct? Explain your answer.

classroomsecrets.co.uk

Reasoning and Problem Solving – Nets of 3D Shapes – Year 6 Greater Depth

Reasoning and Problem Solving
Nets of 3D Shapes

Developing

1a. Ben's net would not work. One of the triangles is a scalene, when all four triangles should be either equilateral or identical isosceles triangles. Chloe's net would work.

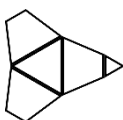**2a.** Various possible answers, for example:

3a. Karl is wrong. Cuboids can be made entirely of rectangles.

Expected

4a. Ian's net would not work. His rectangle is not wide enough to match the circumferences of his circles. Tom's net would not work. His circles are not the same size. Katya's net would work.
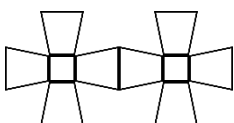
5a. Various possible answers, for example:

6a. Leia is right. As the base will always be a circle, the other face of the cone will always need a curved edge which is part of a circle's circumference.

Greater Depth

7a. Flo's net would not work. It has an extra square between one of the trapeziums and another square. Stu's net would work. Anna's net would not work. Her smallest square is too big. It needs to have sides equal in length to the shortest sides of the trapeziums.

8a. Various possible answers, for example:

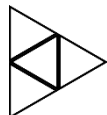**9a.** Rohit is wrong. It is also possible for equilateral triangles to be used.

Developing

1b. Lucas' net would not work. One of the square sides is missing so the cuboid would not be complete. Rosie's net would work.
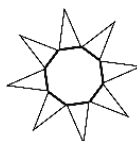
2b. Various possible answers, for example:

3b. Kristen is right. A square base has 4 sides, so 4 triangular faces are always needed.

Expected

4b. Fleur's net would work. Saz's net would not work. Her smallest hexagon is too big. Ryan's net would not work. His trapeziums vary in height when they need to be identical.

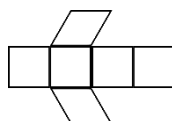**5b.** Various possible answers, for example:

6b. Marshall is wrong. It is also possible for identical isosceles triangles to be used.

Greater Depth

7b. Joe's net would work but it has an unnecessary square which would overlap. Art's net would not work. The triangular prism would end up overlapping, on the longer face of the cuboid. Marie's net would work.

8b. Various possible answers, for example:

9b. Azania is wrong. Any pair of matching heptagons, regular or irregular, can be used.

classroomsecrets.co.uk
Reasoning and Problem Solving – Nets of 3D Shapes ANSWERS