

arctic maths lesson plan 2

Test your arctic
maths skills!



Maths 2 - Arctic shapes

Learning Objectives

- To be able to recognise and name 3D shapes including cube, cuboid, cone, pyramid, sphere and cylinder.
- To identify the faces, vertices and edges of the 3D shapes.
- To work with nets of cubes.
- To solve a number problem involving 3D shapes.

Key Vocabulary

Cube

Cuboid

Cone

Pyramid

Sphere

Cylinder

Net

3D

2D

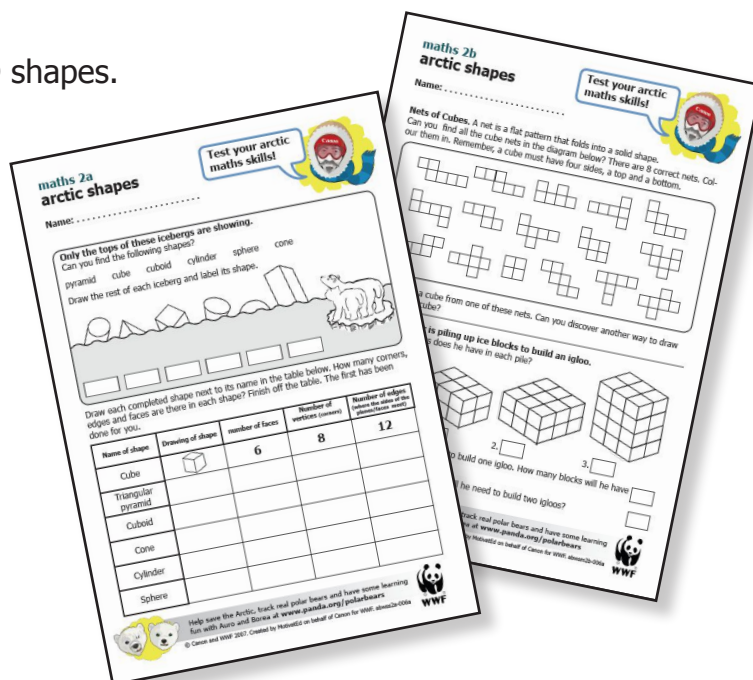
Faces

Vertices

Edges

Planes

Iceberg



Resources

- Maths Activity Sheet 2
- Squared paper
- Pencil, crayons
- Ruler
- Scissors
- Die
- Sheet of paper with a 7 x 8 grid

Warm-up

- For this game of **igloo wall** you need a dice, coloured pencils and a sheet of paper with a 7 x 8 grid. Children work with a partner and take turns to throw one dice. The score shown on the dice shows the number of squares (blocks) which can be coloured in any one row. You can only colour in if the blocks are on the same row. So, throwing a 4 and then a 5 means you have to miss a turn as the target number is 7. The first player to colour in all the blocks in the igloo wall is the winner.

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- Once the children have played the game a couple of times ask them to suggest new strategies and rules.
For example, what happens if you colour in columns rather than rows?
What happens if you change the number of squares in the grid?

Whole Class Introduction

- If the square was three dimensional, rather than two dimensional, what new shape would be created?
- Ask the children to look around the classroom and to point out any 3D shapes which they can see.
- Give them one minute to draw all the 3D shapes they can see.
- How many of these shapes can they name?

Independent Activities

- Can the children tell you what an iceberg is?
Remind them that typically about 80 – 90% of an iceberg is below the surface of the water?
How much, therefore, is showing?
- Look at the first activity on side one of the sheet. The children are asked to draw in the unseen part of the icebergs.
The pyramid could possibly be three or four sided, they need to make a decision about this before moving on to the second activity.
- Recap on the meaning of the terms vertices, faces and edges. Choose a shape from the classroom e.g. a dice or a book to demonstrate these terms before asking the children to complete the grid.
- If possible, prepare a net of a cube, either in paper or from ready made construction shapes. Show the children how the flat plan converts into a solid shape.
- Explain that there are several ways to make a net of a cube. (There are 6 possible arrangements, apart from rotations and reflections). Ask the children to find the 8 nets on the Activity Sheet.
- They can then choose one pattern to make their own cube.
- Finally the children solve the number puzzle based on calculating the number of blocks of ice in a pile. Remind them to include the blocks that can't be seen in this two-dimensional representation of a three-dimensional construction.

Plenary

- Take a look around the classroom and see how many of the six 3D shapes can be found in everyday objects.
- Have the children all got the same answers for the numbers of faces, vertices and edges?
Which was the most difficult shape to work out and why?
- Which shape is used in building an igloo, and how is the shape changed as the igloo forms the dome? Check Science Sheet 1 to remind you.

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Extension Activities

- Show the children a cube on which each face is a different colour. Can they make a net which will reassemble into the cube with the same colour combination?
- Challenge the children to draw nets for other 3D shapes. Start with a tetrahedron (triangular pyramid). This can be made from four triangles. Can they find the difference between a tetrahedron and the Great Pyramid in Egypt? (It has a square base.)
- Invite the children to make up some more puzzles involving stacks of ice blocks. How many different ways (using complete columns and rows) can they find to stack a pile of 48 blocks?
- Explore the effect of global warming on the aboriginal peoples of the Arctic.



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