

Welcome to OpenUpScience

from Cambridge Science Centre.



This issue is all about polar habitats.



The north pole area is called the Arctic

A habitat is a place where animals or plants live. Polar habitats are the areas around the North and South poles of the Earth.

The south pole area is called the Antarctic

Life near the north and south poles can be very hard. Painfully cold winds whip across vast landscapes of ice. The coldest recorded temperature in the Antarctic was -89°C !

Did you know that Santa lives in a polar habitat!

... But even so, there is lots of life that has adapted to survive these harsh lands...



Origami Penguin



One of the most well known polar animals is the penguin. But did you know - penguins only live in the Antarctic! Make your own paper polar penguin.

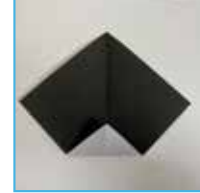
What you'll need

- A square of paper

What to do



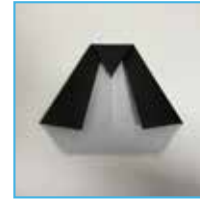
1. Fold the paper diagonally in half and then unfold.



2. Fold the bottom corner up as shown in the image (about a thumbs length).



3. Turn the paper over. Fold in the left and right sides in as shown in the image. These are the wings.



4. Fold the top corner down. This will be the head.



5. Fold in half down the crease and stand up. Pinch the beak and pull out as shown.



Did you know? Penguins can't fly but they can swim! Their feathers are covered in a special oil that makes them waterproof.



Penguin Hop

The penguin must hop across the ice sheets in the correct order to safely reach the egg. Work out the answers to the equations on the ice sheets and find the path of ice sheets with answers 1 to 10.

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6-4

5-3

3+6

6+4

7-3

8-2

3+2

5+3

9-2

1+3

6-3

9-1

6-1

5+1

1+2

1+2

8-4

4+3

9-7

7-1

6+2

5-4

7+3

9-5

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Did you know?

Male Emperor penguins balance their egg on their feet and cover it with their brood pouch (a flap of warm belly skin) to keep it warm.



How Do Polar Bears Keep Warm?

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Polar bears live in the Arctic. How do polar bears and other arctic animals keep warm in the cold?

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What to do

1. Fill a large bowl with the cold water and ice.
2. Put your hand in the water. Time how long you can keep it there until it starts to feel really cold!
3. Put your hand in the plastic glove or second sandwich bag. Wrap a whole bar of shortening or vegetable fat around the glove or second bag.
4. With your covered glove or bag on, put your hand into the sandwich bag.
5. Put your hand into the ice water now. Does it feel different? Time how long you can keep your covered hand in the water. Compare the two times.

What you'll need

- A plastic glove (or another sandwich bag)
- A sandwich bag
- Shortening/vegetable fat
- Ice and water
- Stopwatch



What is happening?!

Polar bears are kept warm by their thick white fur and up to around 10cm thick fat under their skin, called blubber. They barely give off and lose any heat so can be really hard to spot on thermal cameras.

This is 10cm long - the width of a polar bears blubber!

Did you know?

Polar bears and penguins never meet in the wild - they live at opposite poles!

Snow Wandering

How do the feet of polar animals help them move around in polar habitats?



These images are the right size compared to each other.

A polar bears paw is actually 30cm wide!



What differences do you notice between the paw print from the polar bear and the grizzly bear?

People who visit these places have to wear special shoes like this to help them move through the snow!



Polar bear's paws have adapted to the snowy environment of the Arctic. They spread a polar bear's weight evenly, stop the bear from sinking down into the snow and mean that the bear barely makes any footprints in the snow.



Footprints In The Snow

Can you design something that spreads the weight of an egg and leaves no trace?



- What to do**
1. Fill the tub with flour and press it down so that it is flat. This is like the snow.
 2. Use your cardboard and creativity to design a 'snow shoe' for the egg.
 3. Test your design. Attach the 'snow shoe' to the egg and place the egg on the flour. Can you see a mark where the egg was placed?
 4. Try out different designs and see which makes the faintest mark in the flour.

- What you'll need**
- An egg
 - A tub
 - Flour
 - Carboard
 - Sticky tape
 - Any other materials you can find

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My best design looked like this:

Why did your design work well?

True or False?

How well do you know your polar life? Find out with this true or false quiz.

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Solutions at the back



The Antarctic is the largest desert in the world.

- TRUE
- FALSE

A polar bear's skin is black.

- TRUE
- FALSE

The North Pole is colder than the South Pole.

- TRUE
- FALSE

Penguins don't have feathers.

- TRUE
- FALSE

No people live in the polar habitats

- TRUE
- FALSE

Penguins huddle together to keep warm.

- TRUE
- FALSE

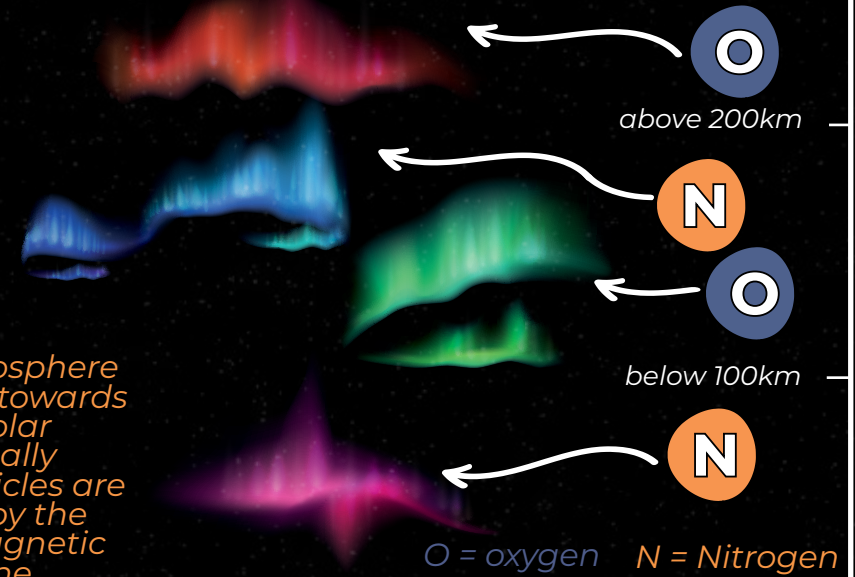
Northern lights

The Northern Lights - also called the *Aurora Borealis* (say "ah-ROAR-ah bore-ee-AH-lis") are coloured lights that appear in the northern sky.

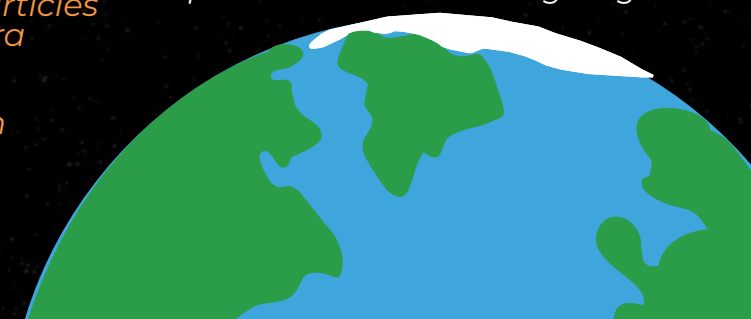


The Northern Lights are the result of gas particles in the Earth's atmosphere hitting charged particles released from the Sun's atmosphere. Variations in colour, from green, to blue, red and pink, are due to the type of gas particles that are colliding and how high in the Earth's atmosphere these collisions happen.

The charged particles from the Sun's atmosphere are blown towards Earth by solar winds. Usually these particles are deflected by the Earth's magnetic field, but the magnetic fields are weaker at the Poles. Some particles enter the atmosphere and collide with gas particles giving us the Aurora Borealis (Northern Lights) and Aurora Australis (Southern Lights).



This shows the colours that different particles at different heights give off.



Design Your Own Northern Lights



Design your own northern lights with some polar animals underneath.

What to do

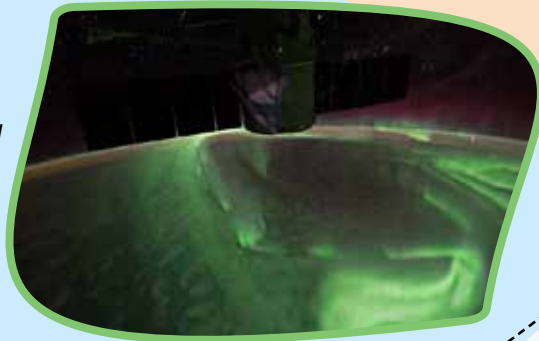
1. Take your black paper and draw different coloured lines and smudge them.
2. Cut out the polar template at the bottom of the page and stick it to the bottom of your paper.

What you'll need

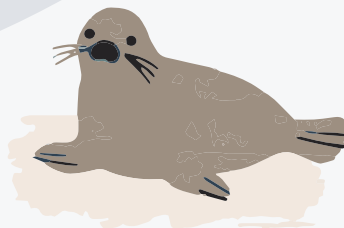
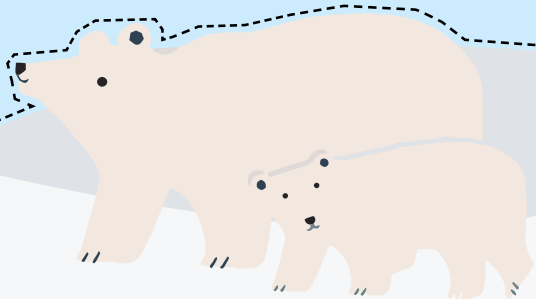
- A5 Black paper
- Colourful art supplies (chalk works well)
- Polar template (bottom of the page)

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This is a photo of the lights taken from the International Space Station.



cut me out



Puzzle solutions



If you have any questions or want to send us a photo of your experiments, drop us an email at openupscience@cambridgesciencecentre.org

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The Antarctic is the largest desert in the world. TRUE
We usually think of deserts as being hot sandy places, but a desert is a very dry area that gets less than 25cm of rain (or snow) a year. Antarctica is nearly twice the size of the Sahara, and although Antarctica isn't hot, it doesn't get much snow, so is a desert. FALSE

A polar bears skin is black. TRUE
A polar bears fur looks white but underneath its skin is actually black! This helps them keep in warmth. FALSE

The North Pole is colder than the South Pole. TRUE
The south pole, the Antarctic, is the coldest place on our planet. Temperatures here have dropped to -89°C! Brrr! FALSE

Penguins don't have feathers. TRUE
Penguins have lots of feathers that are very stiff and packed tightly. They help them stay warm. FALSE

No people live in the polar habitats. TRUE
Although polar habitats are harsh, people have been living there for thousands of years. They have found ways to adapt, survive and thrive. FALSE

Penguins huddle together to keep warm. TRUE
In Antartica, penguins huddle together to share body heat to stay warm in the harsh winds. FALSE

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Fuel, Illuminate**

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We always want to improve, so let us know what you liked - or didn't like - about this issue!

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