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HAPPY FEET Fact & Fiction



March of the Penguins



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Eco Kids planet

Email:
hello@ecokidsplanet.co.uk

Post:
Eco Kids Planet,
41 Claremont Road,
Barnet EN4 0HR

ecokidsplanet.co.uk
facebook.com/ecokidsplanet
twitter.com/ecokidsplanet

For subscriptions, please call 0800 689 1365

Editor:
Anya Dimelow

Educational Consultant:
Beth Ferrey

Ecology Consultant:
Olga Denyshchyk

Writers and Contributors:
Charis Hackett, Gabby Dawnay, Holly Cave, Federica Costa, Katharine Davies, Susan Hayes

Design and Illustration:
Nebojsa Dolovacki, Julia Nikiforova

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ANTARCTICA

A Land of Extremes

Antarctica, aka the South Pole, is even colder than the Arctic, aka the North Pole. With temperatures recorded as low as **minus 89.2°C**, 99% of Antarctica is covered in ice. It is one of the world's most **desolate** regions – remote and inhospitable. It is the **coldest, windiest and driest** continent on earth, with the least diverse habitat. This frozen land has a whopping **90% of all the ice on the planet,** and also contains **61% of the earth's freshwater** (that'll be all the ice).



LANDSCAPE

What at first seems to be a landscape of endless ice is in fact a complex and varied landscape. The ice covers a mysterious world beneath – **glaciers, mountain ranges, ice-covered lakes, liquid saltwater lakes and cold, arid desert**. The **Gamburstev Mountains** (possibly a **billion** years old) are a range that rises to 3,000 metres and stretches 1,200km below the ice, right across Antarctica.

WILDLIFE

Despite the *extremely* harsh living conditions in Antarctica, animals do exist and thrive there – **whales, seals, petrels, penguins, penguins and more penguins** (but no polar bears, because they all live in the *North Pole*). They are almost all dependent on the sea, and they are big, because they need protection against such an inhospitable environment. There are **no trees or shrubs,** and only two species of flowering plants. The male emperor penguin is the only warm-blooded creature that remains in Antarctica throughout the long, dark winter.



Chinstrap penguins



Albatrosses



Weddell seal



Humpback whale



Pangaea: supercontinent between 200 million and 300 million years ago, with today's continents identified within map.

BEFORE THE ICE...

Around **200 million years ago**, all the earth's continents were joined together in a supercontinent called **Pangaea.** Plate tectonics (the large-scale movement of the earth's crust) broke **Pangaea** up, forming **Gondwana** and **Laurasia,** and Antarctica was at the centre of Gondwana. As Africa broke away from South America, and the Indian subcontinent started moving north towards Asia (creating the Himalayas), Antarctica gradually moved south.



ONCE WERE DINOSAURS...

100 million years ago, a broad river flowed across Antarctica, and the climate was a mild **minus 1–10°C**. Giant herbivores, such as **diplodocus, brachiosaurus** and **apatosaurus,** roamed the fertile lands, using Antarctica like a bridge between the continents.



Image: Robert Nicholls/paleocreations.com
Public Domain

An impression of a tropical Antarctica, as it may have appeared 100 million years ago.

Then came the deep freeze, **34 million years ago,** and Antarctica gradually became the region we know today. The dinosaurs didn't survive but their fossils did, frozen below the ice. This deep ice – with an **average thickness of 2.16km** – has sealed and preserved the layers of earth and rock beneath, and the stories they tell.

Scientists will be discovering the many secrets that lie hidden beneath this land of ice for many years to come.

Cool Antarctic facts!

- The **geographic South Pole is in Antarctica,** and is the southernmost point on the surface of the earth.
- **Antarctica** is the **best place on earth to hunt for meteorites,** because they remain mostly undisturbed and stand out in the white snow.
- Antarctica doesn't belong to any nation but is governed under an international treaty.

Nature Under Threat



Vast, ice-covered Antarctica and the Southern Ocean are critical components of the earth's ecosystem. The continent's enormous ice sheet and its polar location make it a powerful heat sink, which regulates the climate of the whole planet.

© Russell Laman / naturepl.com



The Antarctic Peninsula (the northernmost extended part of the continent) is warming about 10 times faster than the rest of the planet – its average temperature has increased by nearly 3°C in the last 50 years.

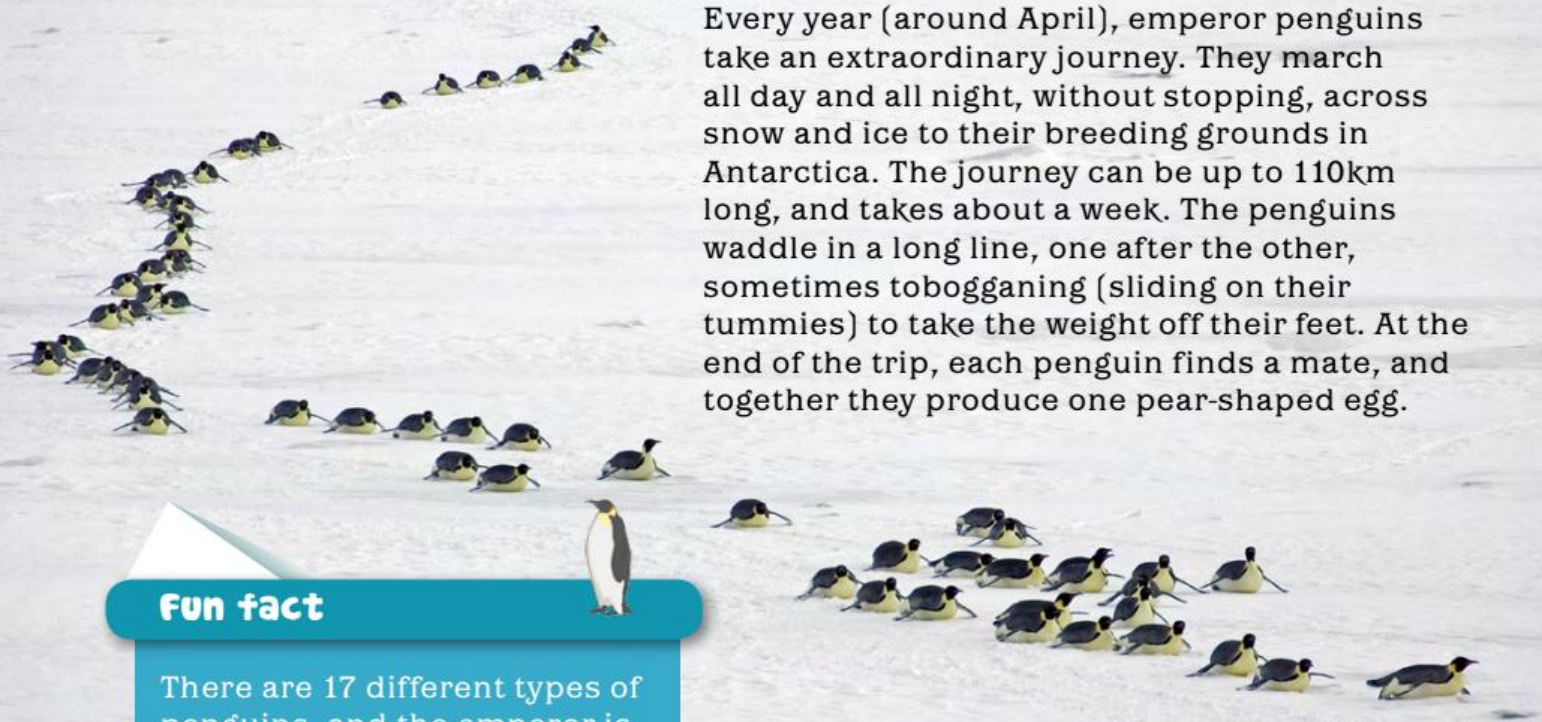
Antarctica has lost about 100 billion tons of continental ice each year since 1993, causing the global sea level to rise by about 0.2mm a year. If all the ice in Antarctica were to melt due to climate change, it would raise the sea level by more than 60 metres.

March OF THE PENGUINS



Autumn: Migration

Every year (around April), emperor penguins take an extraordinary journey. They march all day and all night, without stopping, across snow and ice to their breeding grounds in Antarctica. The journey can be up to 110km long, and takes about a week. The penguins waddle in a long line, one after the other, sometimes tobogganing (sliding on their tummies) to take the weight off their feet. At the end of the trip, each penguin finds a mate, and together they produce one pear-shaped egg.



Fun fact

There are 17 different types of penguins, and the emperor is the biggest. It is about 127cm tall, which can be bigger than a seven-year-old child!

Winter: incubating the eggs

When the egg is laid, it is about 13cm tall (almost half the height of this page). The mother must leave her egg and go back to the water to feed. She fattens up all winter, eating fish, squid and krill, whilst avoiding her predators – leopard seals and killer whales (orcas). She passes the egg carefully to the father, who balances it on his feet. It mustn't fall on to the ice or it might freeze. He covers it with his brood pouch (a warm fold of skin) to keep it warm.



© Fred Olivier / naturepl.com



© Fred Olivier / naturepl.com

Emperor penguins huddle together in the snow.

Fun fact

Penguins cannot fly. Their wings are like dolphin flippers, so are very good for swimming.

The father looks after the egg throughout the harsh, bitterly cold winter. There is nowhere to shelter in Antarctica, so male emperors huddle together to keep warm. The winds howl and gust up to 200km per hour. Temperatures drop to minus 50°C. It's warmer in the centre of the huddle, so the males take turns. They sleep standing up.



Spring: Hatching

The male has to keep the egg warm for more than two months. In spring, the chick hatches. It is covered in woolly down, and snuggles between its father's legs to keep warm. The father hasn't eaten for 125 days, and can't go to feed until the chick's mother returns. When she finally arrives in July, the father moves the chick to its mother's feet for food and shelter, and he can then return to the sea.

When the father has fattened up with fish, he comes back. He listens out for his chick's own special whistle to find it again. To start with, the mother and father take it in turns to find food. But when the chick is big enough, it waits in a crèche with other chicks while its parents go to sea together. The chicks huddle together to keep warm, just as their fathers did during the winter.



Emperor penguin feeding her chick.

Fun fact

Penguin poop is very, very smelly, and can be seen from space! It stains the Antarctic ice reddish brown.

Summer: Growing up

As the weather gets warmer, the parents leave the chicks to fend for themselves. They begin to moult. Their fluffy down is replaced with a coat of shiny, waterproof feathers.

The sea ice melts, and the sea gets nearer and nearer to the breeding grounds, so the chicks don't have far to travel for their first dip. Now they can find fish for themselves. Although penguins look a bit clumsy on land, they are agile in water and can swim very fast. They can reach depths of over 500m and stay underwater for up to 22 minutes without coming up to the surface to breathe.

All spring and summer, the emperor penguins feast on fish, squid and small crustaceans (shrimp, krill and crabs). When they are three years old, the grown-up chicks join the long march to the breeding grounds and have their own young.





Fun fact

Leopard seals eat about 15 penguins a day.

HAPPY FEET

Fact & Fiction

Mumble is different from the rest of the emperor penguins – he tap-dances! As the odd one out, he is blamed for causing the fish shortage, which is leaving the colony starving. Cast out into the wilderness, Mumble makes friends with the Adélie penguins. But will he stay out of danger long enough to find the true reason for the disappearing fish?



1. Emperor penguins

These beautiful birds are the main characters in the film. Mumble's strange tap-dancing ability is made worse by the fact that he can't sing. All penguins are supposed to sing a special 'heartsong' to attract a mate, and Mumble's parents worry that he'll never find true love.



Real life: Although it might not sound *quite* the same as in the film, these penguins really do sing to attract a mate. They also use a large number of different calls to identify each other in the busy colony.

Fun fact: Chicks have 15 feathers per square centimetre to stop them turning into penguin-shaped blocks of ice in the Antarctic's sub-zero temperatures!

2. Adélie penguins

In the film, a group of these cute little singing, dancing penguins makes friends with Mumble. They call themselves the Amigos and are led by Ramón. Together they out-swim a vicious leopard seal. Mumble notices that these penguins carry around rocks, called love stones, to help them get a mate.

Real life: Adélie penguins build their nests by scooping out a hollow in the ground and lining it with small rocks. A male penguin tries to impress a female by presenting her with the best rock he can find. These cheeky birds sometimes steal rocks they like the look of from their neighbours!

3. Predators

Mumble and his friends face many dangers in the waters of Antarctica. As a chick, Mumble narrowly escapes a skua, and after being cast out from his colony, he's nearly caught by a leopard seal. The penguins also run into danger from a pod of killer whales.



Real life: Penguins in Antarctica really do have to keep an eye out for all these animals. The south polar skua sometimes eat penguin chicks alongside their usual diet of fish. Killer whales – also known as orcas – live up to their name by preying upon penguins. Leopard seals have been known to hunt not only penguins and smaller seals, but humans, too. Eeek!

Did you know? Hunting orcas sometimes work in pairs to create a sudden wave, which knocks penguins off the safety of the ice, into the water.

4. Overfishing

Of course, it isn't really Mumble's tap-dancing that is causing the fish shortage. When people finally visit the penguin colony in the film, they realise that their overfishing is putting these beautiful creatures at risk. It's a happy ending for *Happy Feet*, with humans announcing that they will stop all fishing in the Antarctic.



Real life: Fish populations in the Antarctic really are in trouble from overfishing, which means less food for penguins and many other animals. Sadly, we are far from the moment when humans will stop all fishing in the Antarctic, but there is some positive news. A proposal for a large protected area in the Antarctic's Ross Sea region has been discussed for the last five years. This region is home to over a million Adélie penguins, and more than 100,000 emperor penguins. If the marine protected area is established, banning all the fishing there, Mumble and his family will have enough fish to catch.



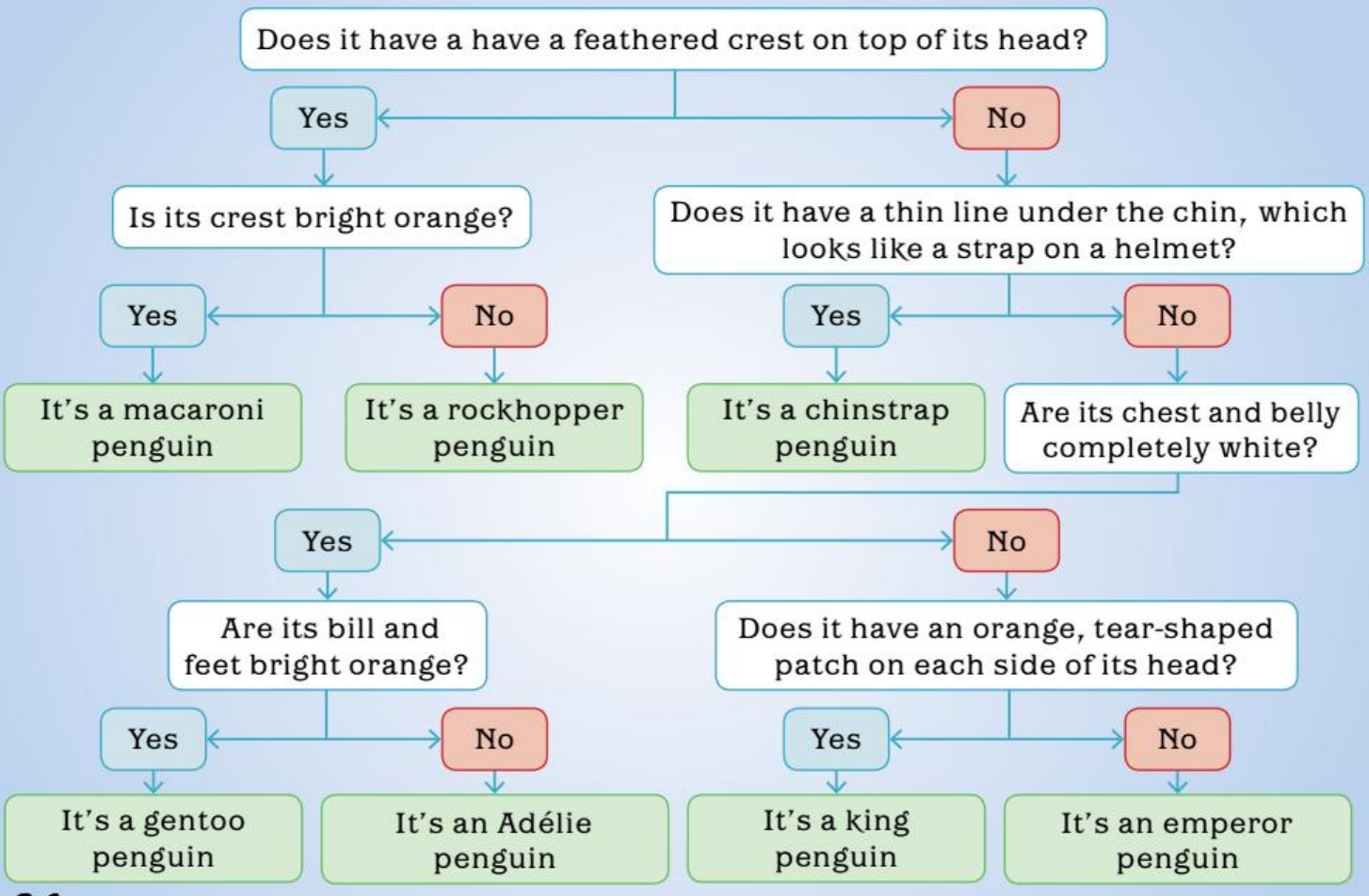


Fun fact: An Adélie penguin would beat you in a race by tobogganing. On smooth patches of snow and ice, they push themselves along on their bellies to save energy and move quicker!

THE Penguin Puzzle

Charlie snapped these wonderful photos of various penguins he spotted on the trip to Antarctica. Can you help him name each penguin correctly? Use the chart below to work out the names of the penguins, and write them under each photo.





Orca (killer whale)



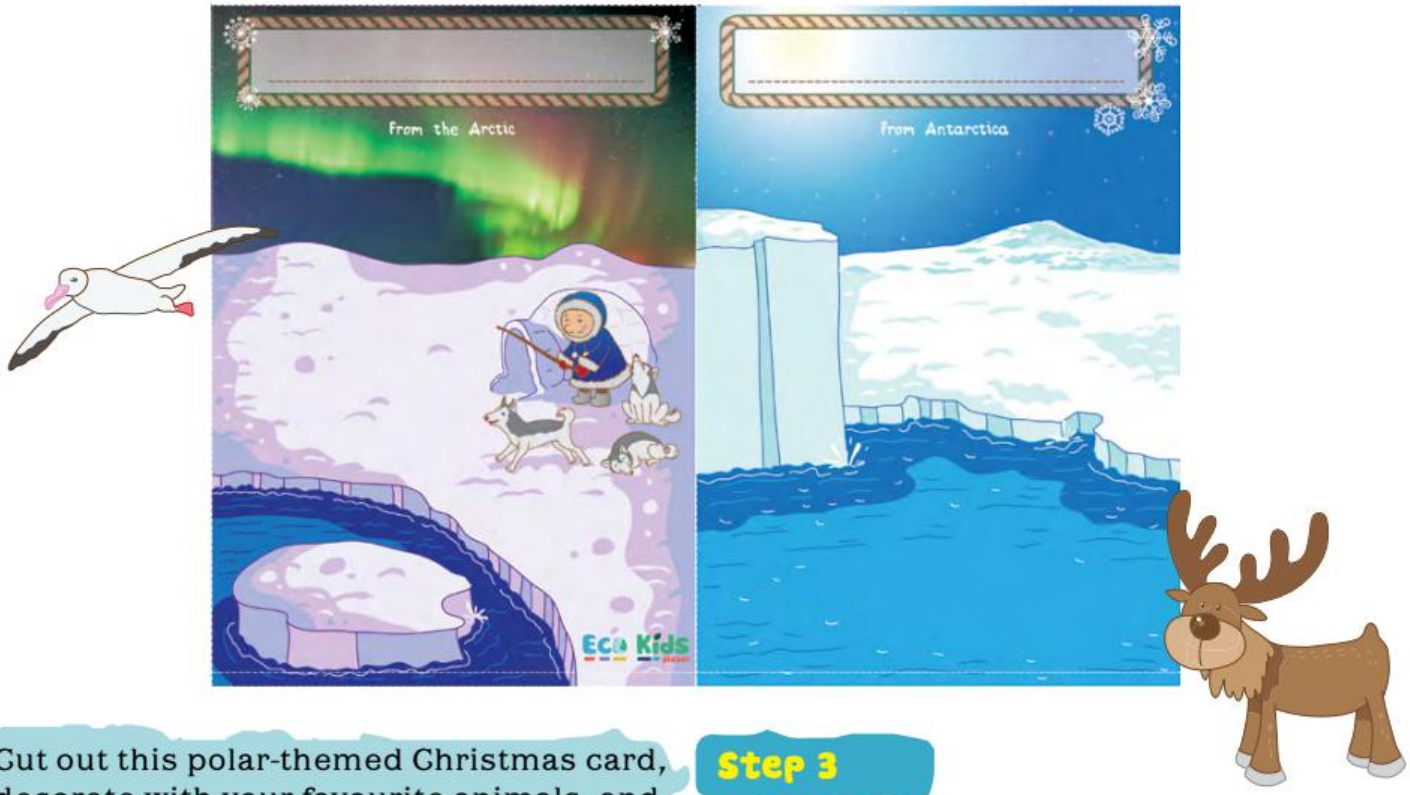
Did you know?

- Killer whales have a black back, white chest and sides and a white patch above each eye.
- Much like packs of wolves or prides of lions, killer whales often hunt cooperatively in pods for food. They work together to encircle and herd prey into a small area before attacking.

For more colouring activities, check out 'Colour & Learn Animals' at brainbox.co.uk.

Greetings Card Craft

Cut out and keep, or give it to someone special!



Cut out this polar-themed Christmas card, decorate with your favourite animals, and send it to someone special. Or perhaps you received this magazine for Christmas? Then turn it into a 'thank you' card instead; there is a space for you to add your own greeting.

Step 1

Carefully cut out the card on page 17 along the dotted line and fold it in half. Write your greeting in large letters in the space. For example: Merry Christmas, Happy New Year, Seasons Greetings, Thank You.

Step 2

Cut out the animals on page 19 and decide which polar region they belong to.

Step 3

Arrange the animals on to the correct background. Hint: don't glue flippers and antlers to the card; instead, fold them to make a pop-up effect.





Step 4

Write a message to your special person inside your card and draw your favourite animal. There is a space for you to write some fascinating facts about your animal or some interesting information you have learned about Antarctica.

Your finished card will fit in a size A5 envelope.

Don't forget to take a picture of your card and send it to us at hello@ecokidsplanet.co.uk or post on facebook.com/ecokidsplanet. Charlie, Amy and Simon would love to see your creations.



_____

From the Arctic



Eco Kids planet

_____

From Antarctica

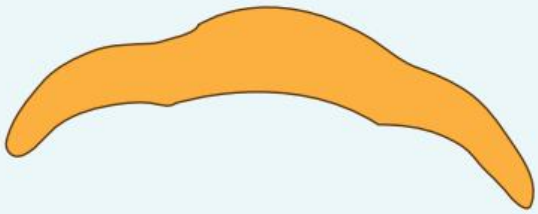


My favourite animal

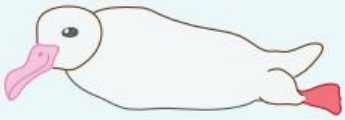
Greeting Card Extras

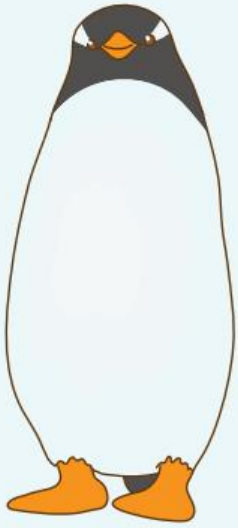
Cut out to create animals and arrange them on your card. See instructions on page 16.





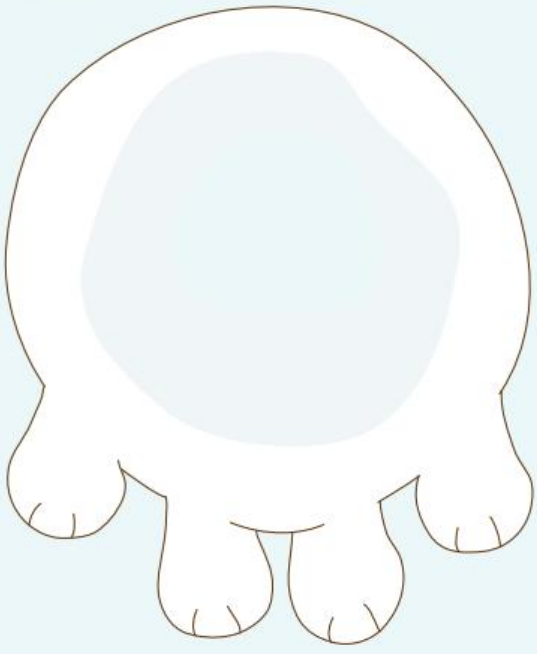


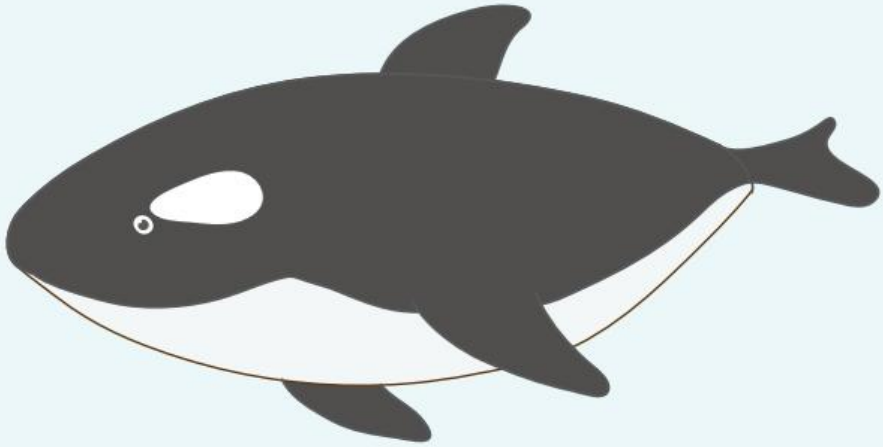
















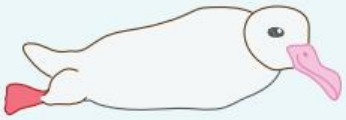
Greeting Card Extras



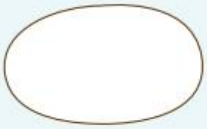


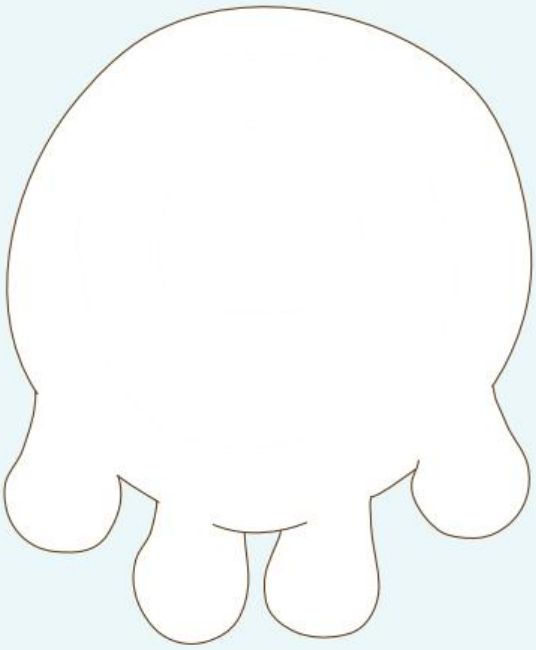


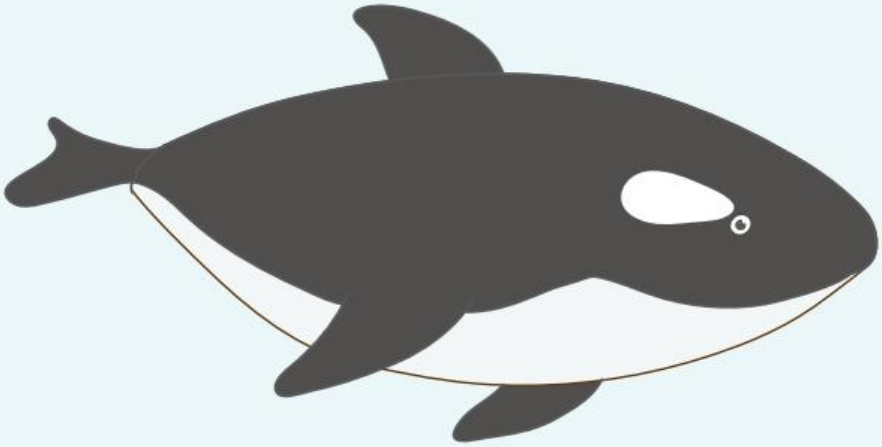


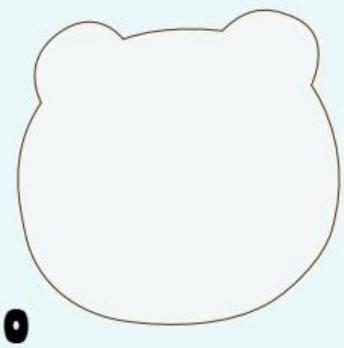


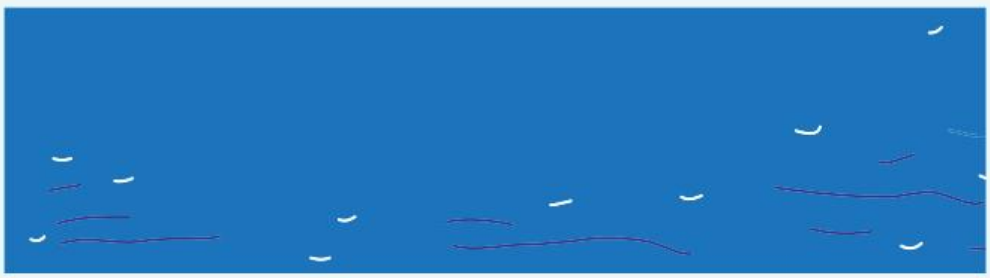












The Arctic

The Arctic is partially frozen Arctic Ocean surrounded by treeless permafrost land.



Over 40 different ethnic groups.

Indigenous people

Arctic Ocean

14 to 16 million km² covered in ice in the winter

2m thick on average

Ice cover

Animals and plants



Terrestrial plants: flowering plants, dwarf shrubs and trees, herbs, mosses, lichens.



Land animals: Arctic foxes, lemmings, reindeer, snowy owls.



Seabirds: Arctic skua, Atlantic puffins.



Marine animals: 2.3% of all world marine species — whales, dolphins, porpoises, walruses, seals, polar bears.



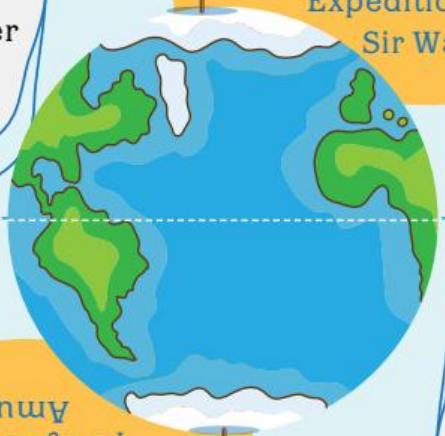
6 April 1969

The British Trans-Arctic Expedition led by Sir Wally Herbert.

-40°C in winter

0°C in summer

Temperature





14 dec 1911

The Norwegian party led by Roald Amundsen.

-60°C in winter

-28°C in summer

Temperature

The Southern Ocean

17 to 20 million km² covered in ice in the winter

1 m thick on average

Ice cover



No indigenous population – it's just too cold!

Indigenous people

Animals and plants



Marine animals: 3.1% of all world marine species – whales, dolphins, porpoises, seals.



Seabirds: penguins, albatrosses, south polar skuas, Arctic terns.



Land animals: wingless midge.



Terrestrial plants: two flowering plants, lichens, mosses.

The Antarctic

The Antarctic is the Antarctica continent covered with an immense ice sheet and surrounded by the Southern Ocean.

Wandering albatross



© Chris & Monique Fallows / naturepl.com

Test Your Knowledge







Across

3. Which country was the first to reach the South Pole? (6)
4. Family of whales with comb-like plates rather than teeth (6)
8. This whale is famous for its singing (8)
11. To fly effortlessly on air currents (5)
12. The biggest animal that has ever existed on earth (4, 5)
14. What type of penguin is the Amigos group from *Happy Feet*? (6)
15. What type of penguin is on the cover of this magazine? (6)
16. A super dry, cold and uninhabited area, Antarctica is a _____ (6)
18. March of the emperor penguins to their breeding grounds (9)

Down

1. The Dutch word ijsberg means ice _____ (8)
2. A supercontinent that existed 150 millions years ago (7)
5. A large group of emperor penguins packed tightly together to keep warm (6)
6. Hunting and killing whales for their oil, meat and baleen (7)
7. The biggest of all penguins (7)
9. To give birth (whales) (5)
10. Which bird has the largest wingspan? (9)
13. The Arctic _____ makes the longest migration of all animals on earth (4)
17. Penguins' biggest predator is the leopard _____ (4)

True or False Quiz

1. There are only two species of plant that grow in Antarctica _____
2. The South Pole is home to seals, penguins and polar bears _____
3. Only half of an iceberg can be seen above water _____
4. Antarctica is a desert _____
5. The mighty emperor penguin is on top of the Antarctica food chain _____
6. Penguin feathers are waterproof _____
7. Penguins are cold-blooded animals _____
8. Blue whales feed mainly on krill _____

See answers on ecokidsplanet.co.uk/free-resources/

TOP MAGNIFICENT-ANTARCTIC-SUPER-MIGRATOR TRUMPS!

For this issue's TOP TRUMPS, the Eco Kids decided to choose four fascinating animals that travel thousands of miles every year to spend winter in warmer climes. No need for speed when endurance is the name of the game. Three of these magnificent Antarctic migrators remain vulnerable and endangered – and each keeps the same mate for life.

1. BLUE WHALE

Mighty mammal, groovy-throated giant and BIGGEST, beautiful baleen whale!

SIZE & WEIGHT 10/10: The **largest animal on earth** – in fact, the largest animal ever to have existed! Blue whales are bigger than the biggest dinosaurs and weigh a whopping 190,000kg (that's roughly 25 African elephants). A blue whale's tongue weighs as much as an elephant and its heart weighs the same as a car. Males measure up to 27m and females up to 33.5m long.

EATS 10/10: **Krill** (tiny, shrimp-like crustaceans), sucking up as much as 5,443kg per day in feeding season, which lasts eight months of the year. They fast for the other four months, and live off their blubber. Blue whales have baleen plates (giant combs) instead of teeth to filter out krill!

LIVES 9/10: For **90 years** or more.

MIGRATION MADNESS 8/10: Cruising at about 20km per hour, blue whales travel several thousand kilometres towards the equator every year to mate and calve in a warmer climate.

SUPER-SKILLS 10/10: Apart from their prize-winning size, they can **sing** – they have the most powerful voice of any animal, and their deep songs can be heard through **vibrations** that travel thousands of kilometres.

POPULATION 2/10: Around 12,000 and **endangered**. Hunted almost to extinction by whaling, their numbers are slowly rising after the 1986 whaling ban. (Pre-whaling numbers: possibly 300,000.)



ECO ISSUES: Chemical and sound pollution, habitat loss due to climate change and over-fishing are forcing blue whales to migrate across even greater areas in search of food.

FUN FACT: Biologists are able to measure a dead blue whale's age by counting the layers of waxy substance in its earplugs – a bit like counting the rings in a tree.

2. HUMPBACK WHALE

"A humpback whale, immensely long, who sang to the snail a wonderful song"
(From The Snail and the Whale, by Julia Donaldson)

SIZE & WEIGHT 10/10: Another massive member of the baleen family, the humpback weighs around **4,800kg.** Males measure approximately **12.9m** and females **13.7m**.

EATS 9/10: **Krill.** Humpbacks have a special feeding method called **bubble-netting**: two whales swim down below the krill, then spiral back up to the surface, forcing the krill into a central whirl of confusion and bubbles. The whales then swim up open-mouthed, and voila – even *faster* food!

LIVES 5/10: For **50 years**.

MIGRATION MADNESS 7/10: Like blue whales, humpbacks spend about four months of the year travelling from the Antarctic to warmer climes. They swim at about 4.8km per hour to conserve energy on the long journey.

SUPER-SKILLS 10/10: Singing! Humpback whales are famous for their songs. They sing to communicate, find a mate and locate food. Their songs can go on for several hours and, like a choir, other humpbacks join in. Songs sometimes reach as far as 5,000km away – *truly awesome!*

POPULATION 4/10: Around **40,000** and endangered. (Pre-whaling numbers: **100,000.**)

ECO ISSUES: The humpback faces similar issues to the blue whale. Although their numbers have also increased since the whaling ban, both breeds remain **endangered**. Both humpbacks and blues also risk injury and death from boats crashing into them, and still face the threat of illegal whaling.



FUN FACT: There are several species of barnacles that only exist on the skin of lumpy, bumpy humpback whales!



3. WANDERING ALBATROSS

Glorious, gliding, wide-winged wonder of the skies!

WINGSPAN & WEIGHT: 3.5m (that's roughly the height of two adults) and the largest wingspan of any bird. Chicks are heavier than adults: 10kg at their biggest.

EATS 7/10: Albatrosses can dive for krill, squid and fish up to 5m deep!

LIVES 6/10: For 60 years.

MIGRATION MADNESS 8/10: Albatrosses travel millions of kilometres in a lifetime! Native to Antarctica, they migrate north to remote islands to nest each winter, and are known to fly thousands of kilometres to find food for their young.

SUPER-SKILLS 8/10: Gliding! Albatross wings are adapted to glide rather than flap. This means they can travel vast distances by gliding on air currents using the minimum amount of energy.



POPULATION 5/10: Approximately 26,000 and vulnerable. Like all these animals, the albatross mates for life and only produces one chick every two years. The chicks need feeding every three to four days for four months, and remain in ground nests, where both chicks and eggs are easy targets for small predators, such as rats.

ECO ISSUES: These beautiful birds face so many threats. Perhaps the two worst are:

- **Long-line commercial fishing:** Birds dive for the line baits, become hooked and are then dragged underwater by the fishing boat and drown – 100,000 albatrosses die this way each year.
- **Plastic waste:** Tens of thousands of chicks die every year when their parents feed them plastic waste from the ocean, having mistaken it for food.

4. ARCTIC TERN

Steady, brave and brilliant bird!

WINGSPAN & WEIGHT 2/10: With a wingspan between **63.5cm and 76.2cm,** and weighing just **100g,** the Arctic tern is easily the smallest of this BIG group.

EATS 6/10: One of the few birds other than hummingbirds that can hover, the tern then dive-bombs for fish and also enjoys insects. During its long migration, the tern stops to feed in a fish-rich area in the middle of the Atlantic Ocean.

LIVES 5/10: For 30 or more years.

MIGRATION MADNESS 10/10: Despite its size, this plucky little bird holds the **record for the longest migration** ever recorded, with an annual round trip of 90,000km, from Antarctica to Greenland and back! Like the albatross, this bird mainly glides, making a massive detour on the way back to take full advantage of the strong global winds that carry it along. The tern even manages to sleep on the wing!

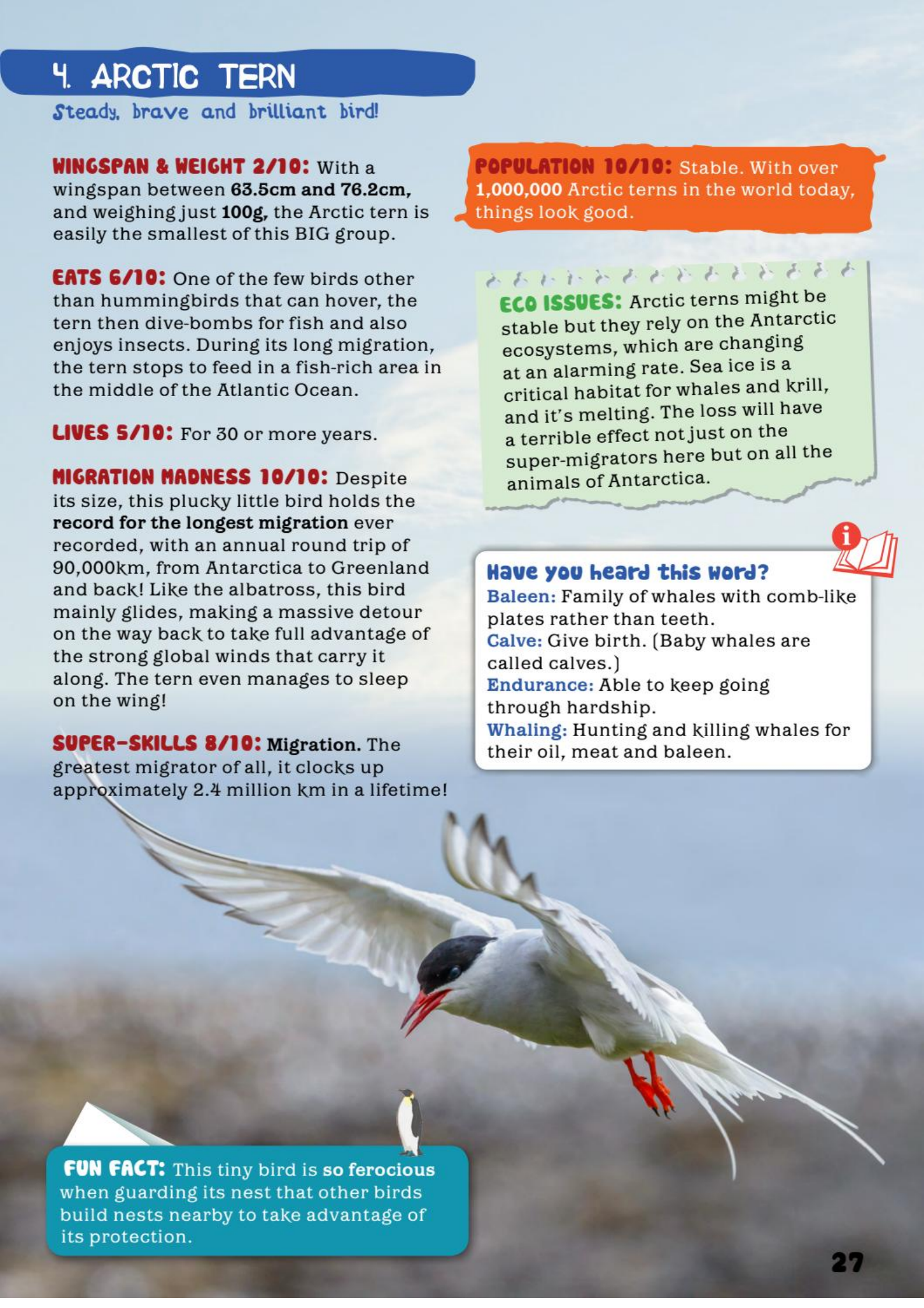
SUPER-SKILLS 8/10: **Migration.** The greatest migrator of all, it clocks up approximately 2.4 million km in a lifetime!

POPULATION 10/10: Stable. With over **1,000,000** Arctic terns in the world today, things look good.

ECO ISSUES: Arctic terns might be stable but they rely on the Antarctic ecosystems, which are changing at an alarming rate. Sea ice is a critical habitat for whales and krill, and it's melting. The loss will have a terrible effect not just on the super-migrators here but on all the animals of Antarctica.

Have you heard this word?

Baleen: Family of whales with comb-like plates rather than teeth.
Calve: Give birth. (Baby whales are called calves.)
Endurance: Able to keep going through hardship.
Whaling: Hunting and killing whales for their oil, meat and baleen.



FUN FACT: This tiny bird is **so ferocious** when guarding its nest that other birds build nests nearby to take advantage of its protection.

Gloriously Dangerous

Antarctic Exploration

1901–1904: A British explorer, Robert Falcon Scott, leads the Discovery expedition, but fails to reach the South Pole by only 740km.



1911: Norwegian explorer Roald Amundsen is the first to reach the South Pole, beating the second British expedition led by Scott by just over a month.



1914: Irish explorer Ernest Shackleton sets off to cross the Antarctic continent via the South Pole. He never reaches the continent. Crashing in the ice on his ship, Endurance, just 150km away from the land, he drifts away and reaches Elephant Island after 14 agonising months.

1897–1922: 16 major expeditions set off to discover the new land.

1897 | 1901–1904 | 1911 | 1914

1897–1922: The heroic age of Antarctic exploration

Early 20th century –

… and its dirty secret

Extremely cold temperatures, frozen land and an absence of rain make Antarctica a perfect natural fridge. Before people arrived on this remote, desolate continent, there weren't too many things to store – perhaps only the Dry Valleys preserved canvases of seals, turned into mummies by severe cold and wind.

Now the storage is full. The bits of ice-free land are covered with scrap and waste dumped by expeditions. Abandoned vessels, vehicles, decaying field huts and open pits of trash have become an ordinary part of the Antarctic landscape.

Antarctica has been inspiring explorers for centuries. From the time Captain John Davis, an American seal hunter, set foot on the frozen land in 1821, explorers from around the world have been lured by the mysterious icy continent and its amazing wildlife. This timeline shows major expeditions throughout history.

Numerous whaling voyages set off to the Antarctic region to hunt whales for their blubber.



1957: The first permanent station, the Amundsen-Scott Station, is built on the geographic South Pole.



Dozens of research expeditions take place to explore and to learn more about the continent.

1957 **1960**

- 1960: The whaling period **1947–2015: Intensive exploration and research**

The whale hunters established several whaling stations on the Antarctic islands to process whales' blubber. These stations have now turned into ghost towns with the abandoned vessels, factories and equipment.



During the first expeditions, waste wasn't managed properly. Explorers dumped garbage into the ocean or on to the sea ice to let it float away in the ocean. They left more than 70 waste sites with oil cans, broken-down car batteries and machinery – creating **thousands of tons of waste**.



Keeping Antarctica Clean

At the end of the 20th century, **the Antarctic garbage rules** were created. All countries carrying out research in Antarctica signed the Madrid Protocol, taking responsibility over the environment of the sixth continent.

1. They agreed to clean up the mess left by the earlier expeditions.
2. Dangerous materials such as polystyrene beads (plastic 'peanuts' found inside boxes with fragile items) became banned on the continent. The plastic foam doesn't decay and, once it gets into the sea, it floats there forever, killing animals that mistake it for food.
3. All waste is now separated – to recycle or return to the research stations' home countries.

Today, people working in Antarctica try to **minimise their ecological footprint**. Research stations are equipped with up to 20 different trash bins to be shipped off the continent.

IT'S TIME FOR CHILLING SCIENCE!

ICEBERG INVESTIGATION...

See for Yourself!

What happens to water when it freezes? Why do big icebergs float on water? We'll answer these questions with a simple (and very cold) experiment! Brrrr...

Materials you need:
- A plastic cup
- A permanent marker
- A transparent bowl

STEP 1:

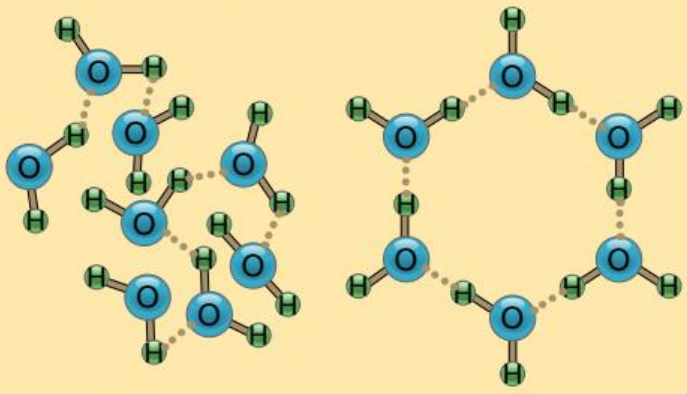


How do you do it?
- Fill the plastic cup with tap water, then mark the level of the water with the marker.
- Gently put the cup in the freezer – be careful not to tip any water out of the cup.
- Leave the cup in the freezer for a few hours or overnight.
- Once you see that the water has frozen and become ice, take the cup out of the freezer.
- Now check the level of ice: is it higher or lower than the mark you made before?

What do you see?
The level of ice is higher than the mark you made before for the water.

What happened?
You can see that even though you didn't change the amount of water, the ice is almost overflowing from the cup. This is because water expands when freezing, due to changes in its molecular structure. A water molecule is made of an atom of oxygen and two atoms of hydrogen, strongly bonded together. Different water molecules interact with each other by creating flexible, weak bonds. When water freezes, water molecules create more bonds between each other, and need more space... That's ice!

Here you can see an illustration of the process:



Water Ice

STEP 2:

How do you do it?

- Fill a transparent bowl with water, take the ice out of the plastic cup and place it in the bowl of water.
- Have a look at what is happening to your piece of ice: does it sink or does it float?



What do you see?

The ice is floating in water – it doesn't sink!

What happened?

From step 1, we learned that the same amount of water takes up more space when it turns to ice. This means that ice is less dense than water (the same amount of water takes up more space in the form of ice).

If you look closer at the ice in your bowl, you will see that most of your ice remains below the surface. The same thing happens to big icebergs floating on seawater in the Arctic and Antarctic! You can only see the tips of the icebergs.



Cool Iceberg Facts!

The word iceberg comes from the Dutch word 'ijsberg', which means ice mountain.

We can only see the tip of the iceberg above water – typically only 10%, meaning a whopping 90% is hidden below the surface!

Icebergs are usually made from snow that fell thousands of years ago.

For the most curious of you,
here's a really interesting video:
www.youtube.com/watch?v=UukRgqzk-KE

Over to You



Snowy Owl's Rendezvous:
from the Arctic to Scotland to...



Daisy (age 8) in Chester, United Kingdom





Harry (age 6) in Bath, United Kingdom



Esther (age 8) in Exeter, United Kingdom



Maeve (age 6) in Leeds, United Kingdom



Here is Emily (age 8) and Sacha (age 5) with their fiery masterpieces from the previous issue. A fun and very sticky activity! Well done!

Please email your letters, pictures and drawings to hello@ecokidsplanet.co.uk or write to Eco Kids Planet, 41 Claremont Road, Barnet, EN4 0HR.

The Antarctic FOOD CHAIN



Amy has been thinking about food chains in the Antarctic ever since she caught sight of a killer whale chasing an Adélie penguin. In such harsh conditions, every animal is fighting for survival.

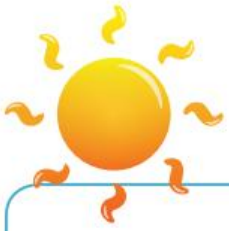
A food chain shows where the energy goes (in other words, what gets eaten by what).

Plants are called **producers** – they make their own food by photosynthesis. All animals are **consumers** – they consume (eat) food to get their energy.

Help Amy complete the food chain by writing the name of each living thing in the box, then use these words to label your food chain: 'eaten by', 'predator', 'prey', 'consumer', 'producer'.



Hint: a food chain starts with a plant.





Squid



Krill



Phytoplankton



Killer whale

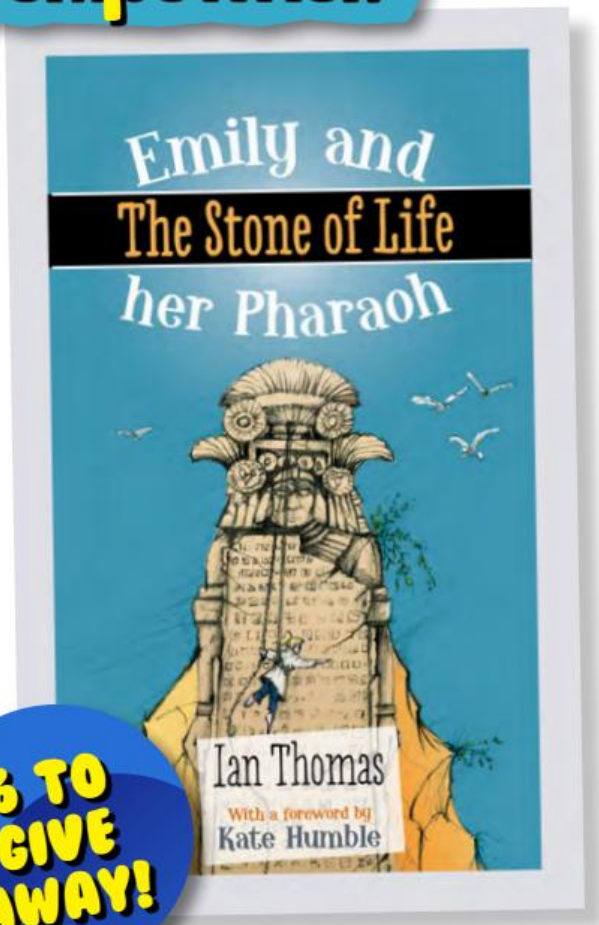


Gentoo penguin



Leopard seal

Competition



6 TO GIVE AWAY!

RRP £12.99

Emily and her Pharaoh

Brace yourself for a magical adventure in this brilliant book! *The Stone of Life* is the third instalment in Ian Thomas' series of time-travelling adventures with Pharaoh, an ancient whale who wants to show the human race how to save the marine environment. When Emily visits Mexico to explore the damaged coral reef, Pharaoh whisks her away on a thrilling and dangerous quest to find a vital message written on a sacred stone. Can Emily help to save the planet?

To enter:

Unscramble these five anagrams to reveal the names of five marine animals.

1. LUBE WHEAL
2. HARKS
3. STRAYING
4. PAROLED SALE
5. SEASHORE

Send your answers to win@ecokidsplanet.co.uk

Closing date: 7 January 2016

WE'D LOVE TO HEAR FROM YOU! Your chance to tell us what you think

What's the best thing in this issue of Eco Kids Planet?

.....

What's your least-favourite thing in this issue?

.....

Which magazines and websites do you use to help you with schoolwork?

.....

What would you like to read about in the future issues of Eco Kids Planet?

.....

Your details!

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Date of birth .....

Address .....

Postcode .....

Telephone .....

E-mail .....

Parent/guardian's name .....

Parent/guardian's signature .....

I acknowledge my child's participation in the reader survey.

Send your entries to:
E: hello@ecokidsplanet.co.uk
Post: Eco Kids Planet, 41 Claremont Road, Barnet, EN4 0HR

Eco Kids Planet will not share your personal details with third parties. For details of our privacy policy, please go to ecokidsplanet.co.uk.

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Eco Kids Planet 2015 Bundle



IN THE NEXT ISSUE OF ECO KIDS PLANET

Issue 15

CHINA:

Bamboo Forests of the Giant Panda

The Bamboo Bear
Life and struggle of the giant panda

Kung-Fu Panda
Fact & Fiction







Animal Top Trumps
INSIDE CHINA'S CONIFEROUS FORESTS

Celebrating Chinese New Year
THE YEAR OF THE FIRE MONKEY

