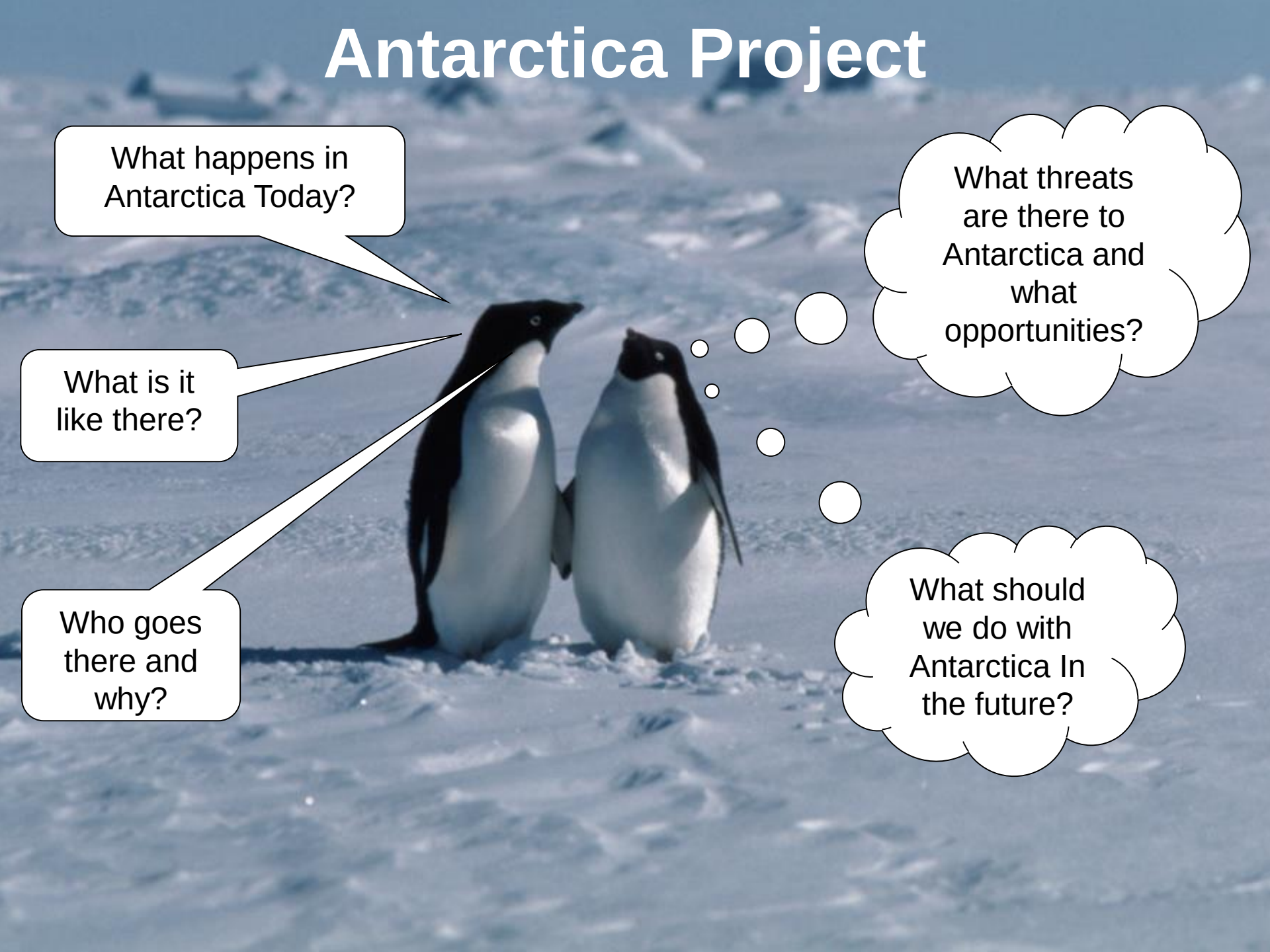
Antarctica Project Introduction
11-16 age group

A starting point for a project on Antarctica
Originally produced for students in the UK to help them prepare for their external examination coursework at age 16 (Geography GCSE)
Red text indicates action needed or delete that part

Pictures by Alan Light, Paul Ward
Text by Rachael Peryer, Paul Ward / CoolAntarctica.com

Antarctica Project

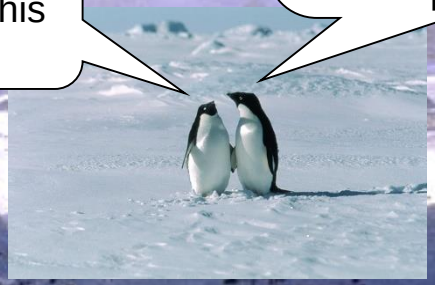


Your report on Antarctica should cover:

- What is Antarctica like?
- How is Antarctica used by people?
- What are the effects of these uses on the ecosystem?
- How can these pressures be managed?
- What are the aims of the Antarctic Treaty?
- What do different group of people think about the way Antarctica is managed?
- What do you think?

What is Antarctica like?

- We are going to watch a few short movies
- As you watch think about why this is called ‘the white continent’
- Try and describe the landscape you see



Antarctica is the world’s last great wilderness

What is Antarctica like?

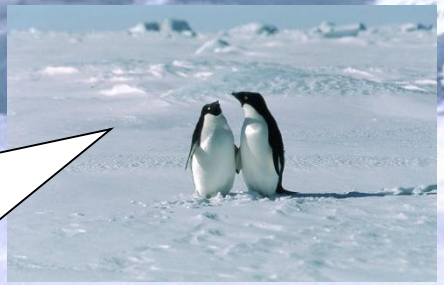
Use a world map and a close up map of the continent

Don't forget to give the map a title and scale and a N point!!

- Describe the location of Antarctica.
- What are the key features of Antarctica?
- How big is the continent?

- What is the landscape like? What else lives there?
- Describe what you have just seen on the movies

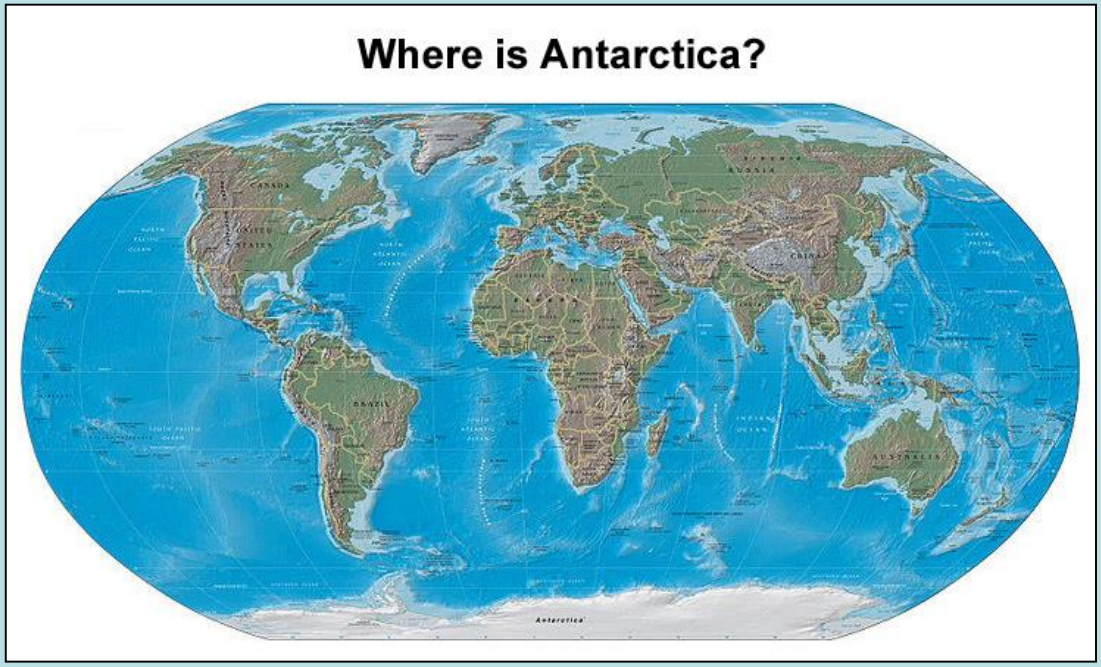
- What is the climate like?
- Why is the climate like this?



Draw a climate graph and describe what it shows. What else can you say about the climate?
Did you know Antarctica is a desert?

Now try and explain why this is such a special place

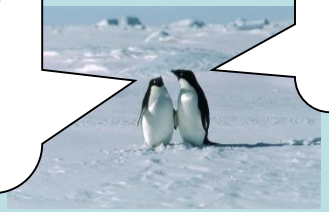
Locating Antarctica



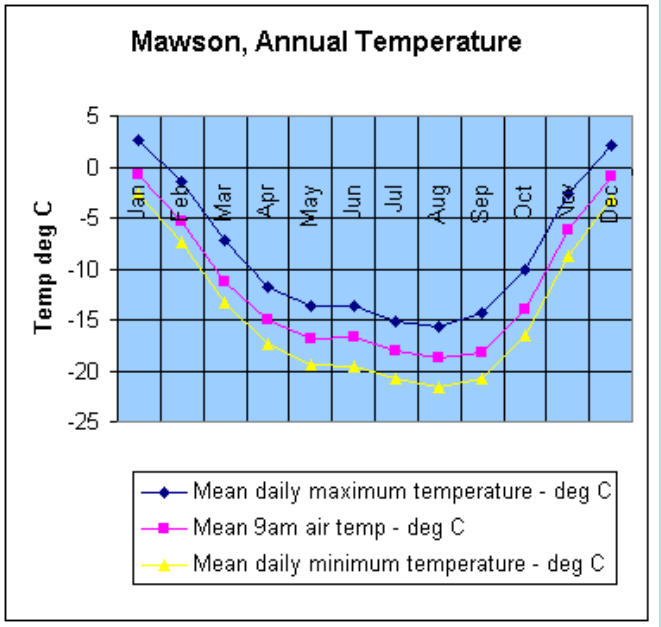
Remember distance and direction!

The Antarctic Climate

Now draw a graph of your own. Remember a bar chart for precipitation and a line graph for temperature



Describe what the graph shows. Include facts and figures



How does this compare with the climate in your country? Look in the atlas

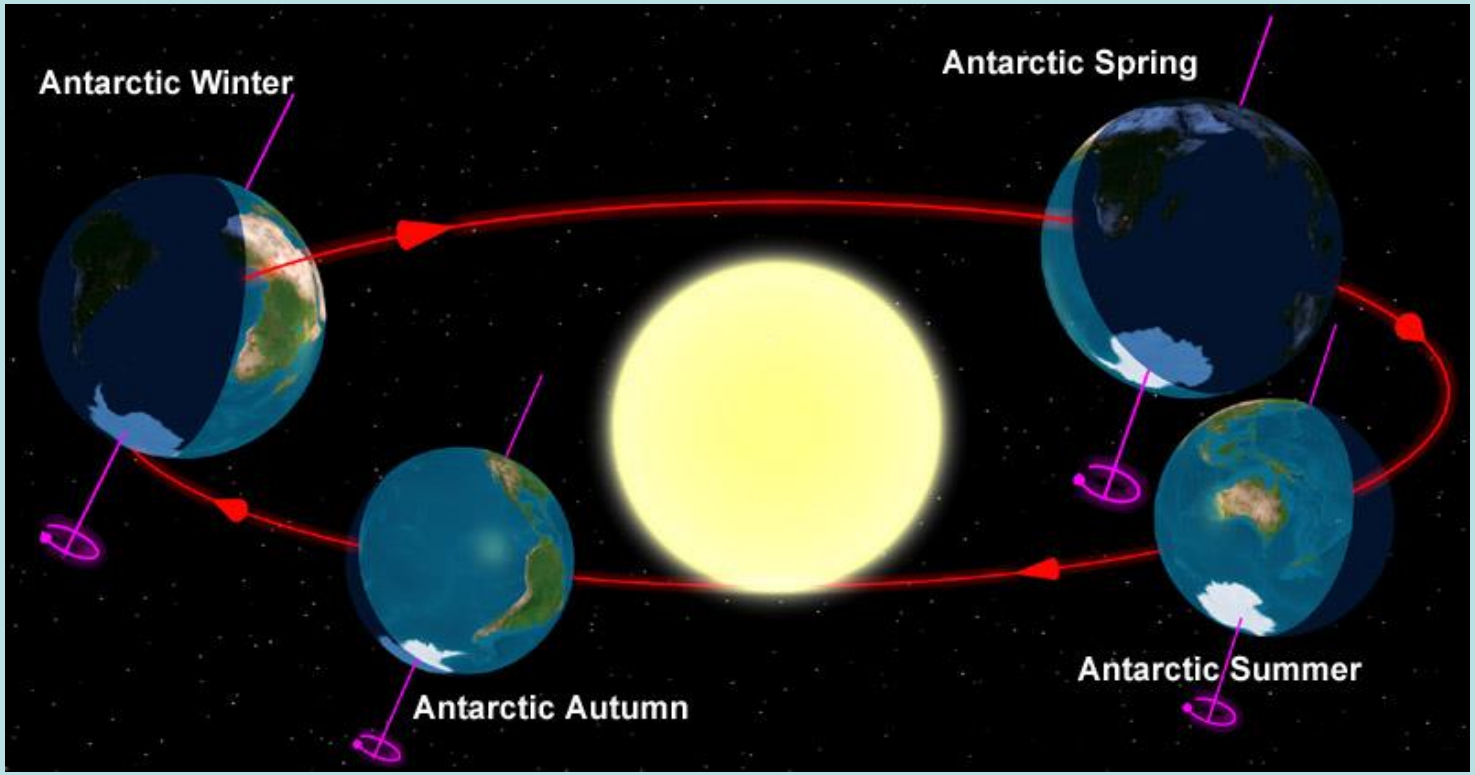
Temperature Data °C		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Range
Continental High Plateau	Vostok	-32.1	-44.3	-57.9	-64.7	-65.6	-65.2	-66.9	-67.6	-66.0	-57.1	-43.3	-32.1	-55.1	36.0
Continental Low Plateau	Byrd	-14.7	-19.8	-27.7	-29.7	-33.0	-34.1	-35.6	-36.7	-36.6	-30.2	-21.4	.14.4	-27.9	22.3
Continental High Latitude Coast	McMurdo	-2.9	-9.5	-18.2	-20.7	-21.7	-23.0	-25.7	-26.1	-24.6	-18.9	-9.7	-3.4	-16.9	23.8
Continental Low Latitude Coast`	Mawson	-0.7	-5.4	-11.2	-15.0	-16.8	-16.7	-18.0	-18.8	-18.2	-13.9	-6.2	-0.9	-11.9	18.9
Antarctic Peninsula	Rothera	1.0	0.1	-1.6	-3.7	-6.8	-8.8	-12.6	-11.8	-9.4	-7.2	-3.3	0.2	-5.3	13.6
Antarctic Islands	Orcadas	0.3	0.5	-0.6	-3.0	-6.7	-9.8	-10.5	-9.8	-6.4	-3.4	-2.1	-0.5	-4.3	11.0
Sub-Antarctic Islands	South Georgia	4.7	5.4	4.6	2.5	0.2	-1.5	-1.5	-1.5	0.1	1.7	3.0	3.8	1.8	6.9

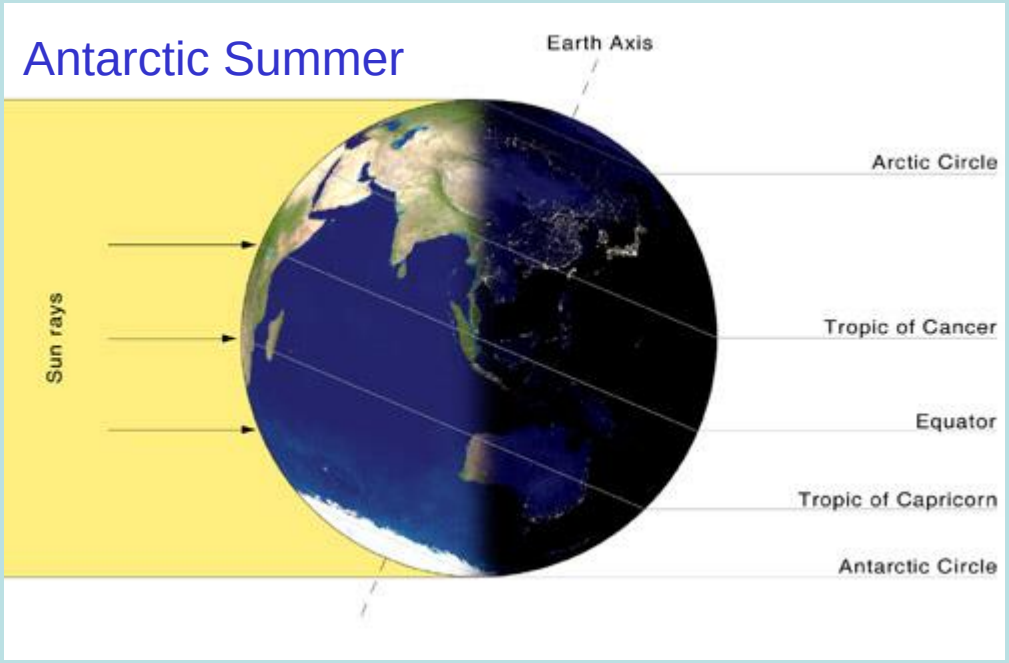
McMurdo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
Average daily temperature °C	- 2.9	- 9.5	- 18.2	- 20.7	- 21.7	- 23	- 25.7	- **26.1**	- 24.6	- 18.9	- 9.7	- 3.4	- **16.9**
Mean monthly rainfall* mm	15	21.2	24.1	18.4	23.7	24.9	15.6	11.3	11.8	9.7	9.5	15.7	Annual total 202.5

Why is Antarctica so cold?

Sunlight strikes the earth straight on (at a right angle) at the equator and then the angle gets more acute as you move away from the equator towards the poles. This means that at the poles the available sunlight and heat is spread over a greater area. The tilt of the earth as the seasons go by make this effect even greater in the winter.

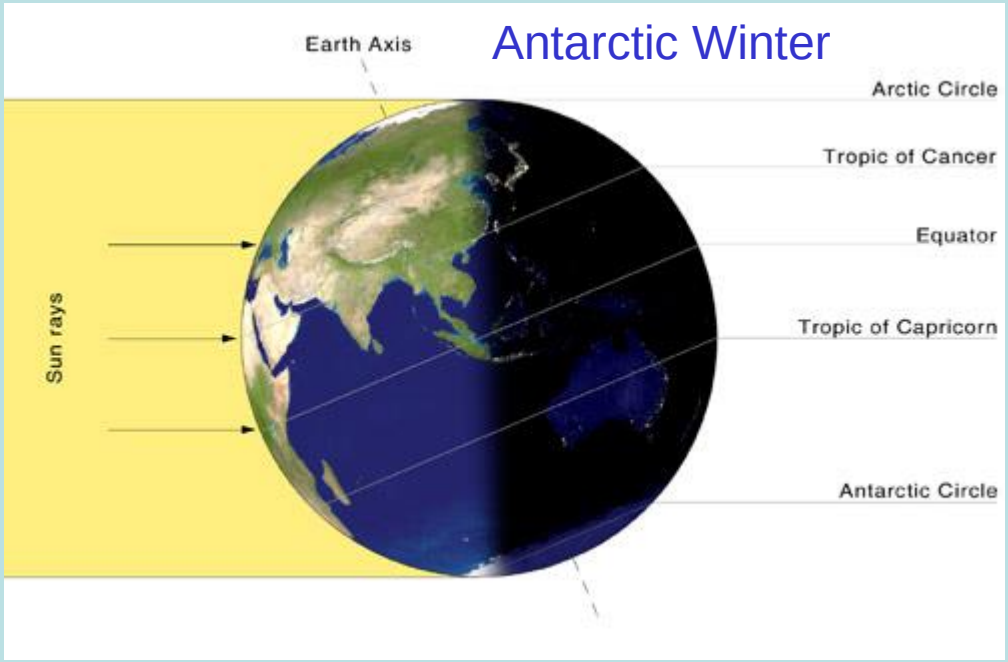
Antarctica is also the highest continent. Temperature falls as altitude increases. Antarctica is a landmass and so apart from the coasts is not affected by sea temperatures which stop it getting quite so cold for so long as in the Arctic.





Left - In the Southern (austral) summer, the continent of Antarctica is facing the sun and gets more energy. That part of the continent that is inside the Antarctic Circle has some time of 24 hour light, where the sun never dips below the horizon.

Right - In the Southern (austral) winter, the continent of Antarctica is facing away from the sun and gets less energy. That part of the continent that is inside the Antarctic Circle has some time of 24 hour darkness, where the sun never rises above the horizon.

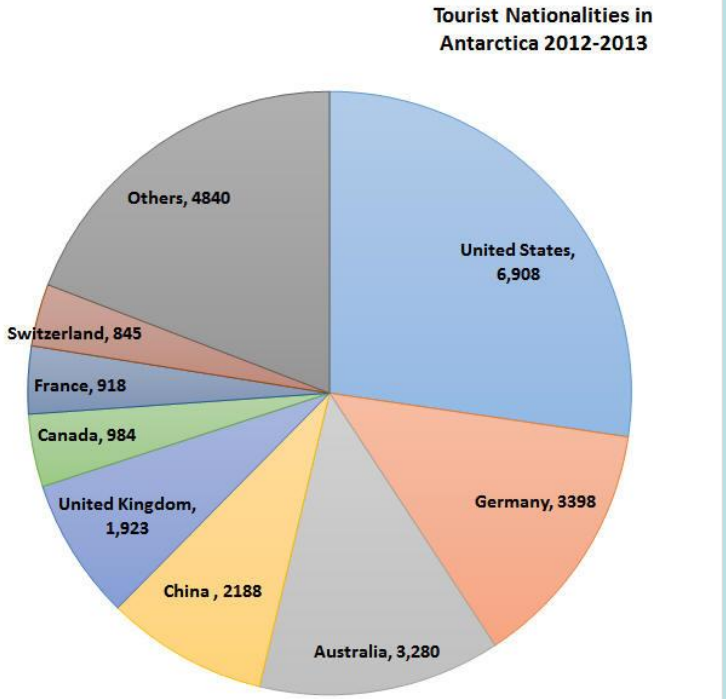


Antarctica is certainly the most pristine place on earth although it is not as unspoiled as may be imagined. For more than a hundred years people have travelled to Antarctica and most parts have now been visited. More than just footprints have been left and more than just photographs have been taken.

Some Antarctic species have been taken to the verge of extinction for economic benefit. Others have been killed or disturbed; soils have been contaminated, sewage has been discharged into the sea and rubbish that will not decompose or break down has been left behind in even the remotest parts.

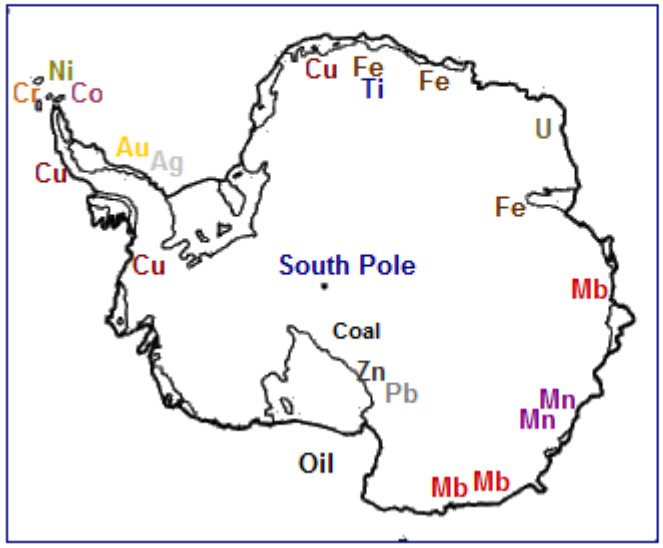
Recently attitudes have changed as we begin to realise that there are **few unvisited places left on earth** and that they are tremendously important to humanity. Antarctica's clean air, water and ice of are of importance to science for understanding how the Earth's environment is changing both naturally and as a result of human activity.

Tour operators are beginning to tap a huge and ever increasing demand to visit the Earth's last great wilderness. Both science and tourism have the potential to damage the very qualities that draw them to Antarctica.



Mining in Antarctica

Mineral map of Antarctica showing known significant deposits of various minerals



Key

- Ag - Silver
- Au - Gold
- Co - Cobalt
- Cu - copper
- Cr - Chromium
- Fe - Iron
- Mb - Molybdenum
- Mn - Manganese
- Ni - Nickel
- Pb - Lead
- Ti - Titanium
- U - Uranium
- Zn - Zinc

How is Antarctica used by people?

Find out facts about each of these uses. Write a short paragraph about each one. Don't forget to include facts and figures. Some pictures would be good

Threats to Antarctica

Scientists could make a mistake, I mean – look at him!

Look Mum a Human!

I think he's a tourist

There's another one over there taking pictures look

Exactly - like contaminating Lake Vostok

I gets my photo taken lots coz I is well pretty

Don't be silly dear there's no such thing

That could never be repaired again

What about Global Warming?

No more ice

No more tummy sledging

Nesting places harder to find

Mining for minerals could be seriously bad news!

I don't want them catching all our fish

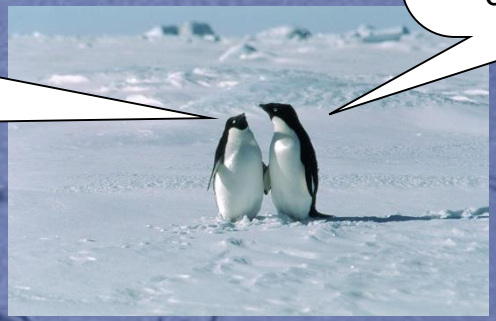
Catching our krill would be worse

What happen if they start to fall out over owns Antarctica?

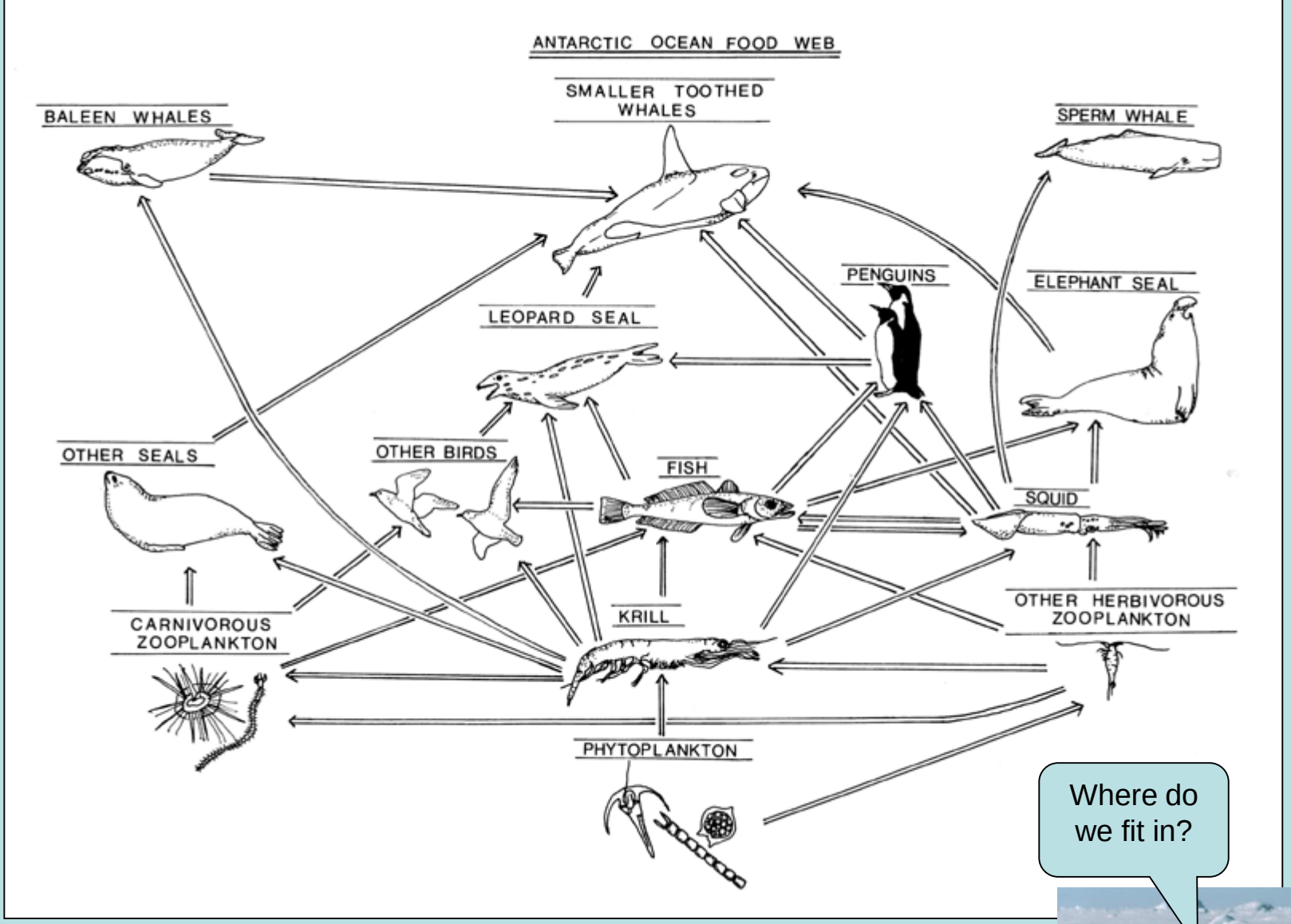
What effects do these uses have on Antarctica?

Who's eating who?

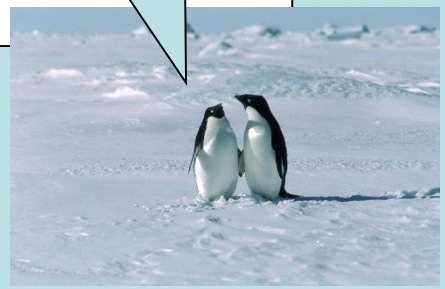
To get the marks here you have to talk about the ecosystem



I'd better revise this and think about consumers producers, herbivores, carnivores etc.



Where do we fit in?



Describe how the food web is affected by people…….
Remember if the krill dies then the whole food chain is affected

Antarctica has a fragile ecosystem

Mainly because a lot of the marine life relies on krill, which is at the bottom of the food chain. If the number of krill was to decline, this could have knock-on-effects on the other creatures that depend on krill for their survival.

The amount of plankton (producer) blooms would increase as the primary consumer has been removed.

Plankton absorbs carbon dioxide and the Southern Seas act as a carbon sink. This may help to reduce the greenhouse effect.

How can the pressures on Antarctica be managed?

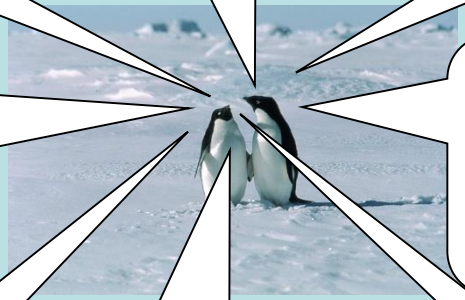
All Agreed?

Without an international agreement like the Antarctic Treaty there would be a free-for-all in Antarctica – anybody could do or take what they want.
Come up with a list of five rules that you agree are the bare minimum for any Treaty that decides what goes on in Antarctica.

Use this **word bank** for useful words to include in your five rules:
Ban | Quota | Limit | Introduce | Prohibit | Prevent | Protect | Reduce | Improve | Enhance | Monitor

"It is in the interest of all mankind that Antarctica shall continue to be used forever for peaceful purposes and shall not become the scene or object of international discord"
The Antarctic Treaty, 1961

The Antarctic Treaty



Claims to own parts of Antarctica are not allowed

No military activity is allowed

Some materials aren't even allowed to go there e.g. polystyrene

All rubbish must be taken away from Antarctica

Any proposals for using Antarctica have to be investigated. If they will damage the environment they are not allowed!

Mining is banned at the moment

Testing nuclear weapons and dumping nuclear waste is banned

Fishing is carefully controlled

The Treaty says Antarctica is a good place for scientific research. Countries who conduct research in Antarctica have to share their results with other members of the treaty

The 1961 Antarctic Treaty Covers 5 Main Areas

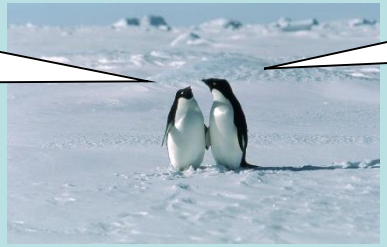
- No military use shall be made of Antarctica, though military personnel and equipment may be used for peaceful purposes.
- There will be complete freedom of scientific investigation.
- Antarctic Treaty Nations will exchange plans for their scientific programmes, scientific data will be freely available and scientists will be exchanged between expeditions where practical.
- No activities under the Treaty will affect claims to sovereignty of any part of Antarctica made by any nation.
  All territorial claims are put aside for the duration of the Treaty.
- Nuclear explosions and nuclear waste disposal are banned from Antarctica.

What are the good and bad things about these ideas?

What are the different viewpoints about Antarctica and the way it should be used?

Discovering Antarctica - Which view of the future?

Sidney Suit doesn't really care about what happens to us and our home!



Laura Leaf has a different view!

Different people have different views

Greenpeace….
An environmental pressure group

You must explain why they hold the view they have

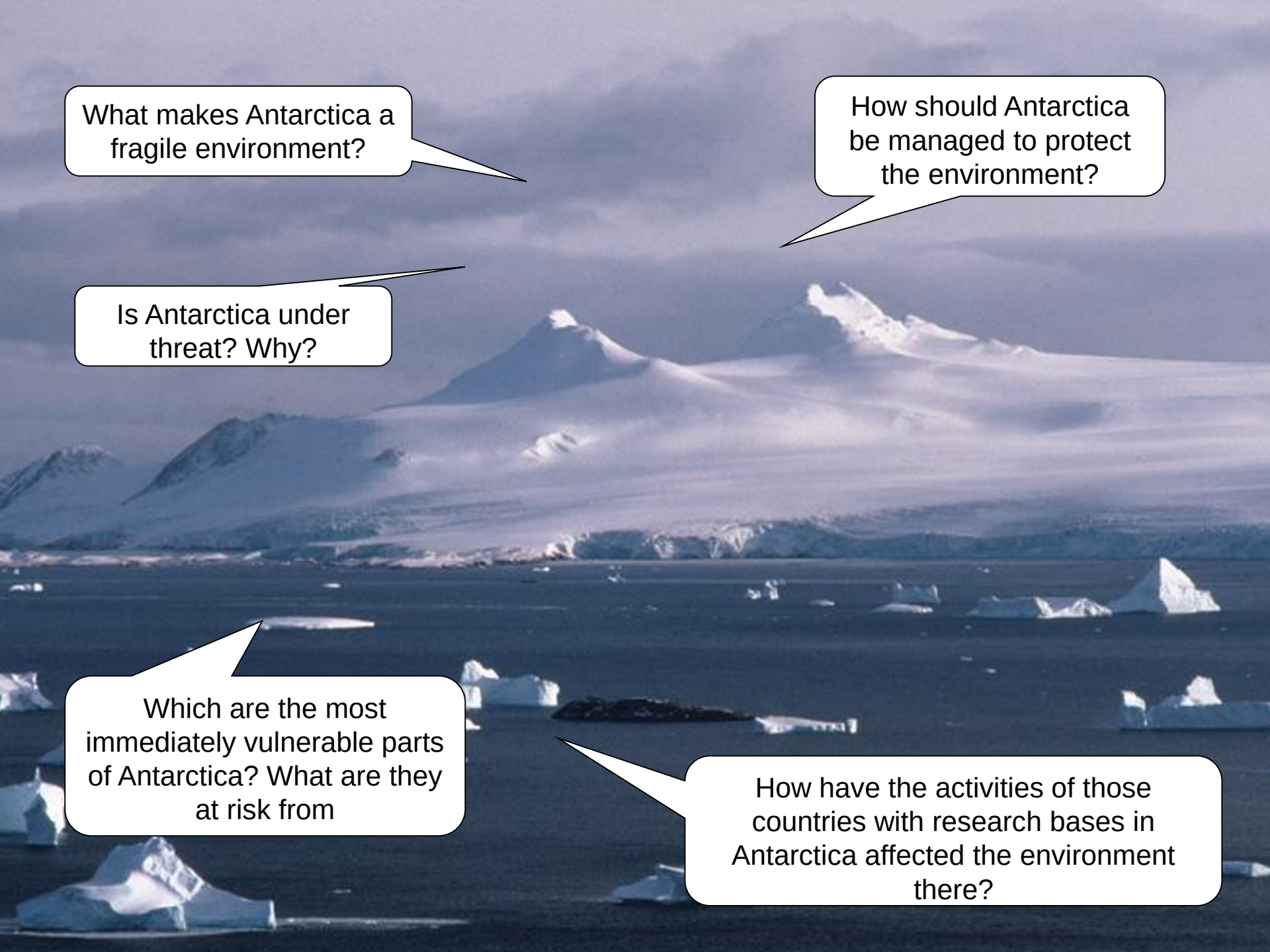
Ban Ki Moon
United Nations
Secretary General

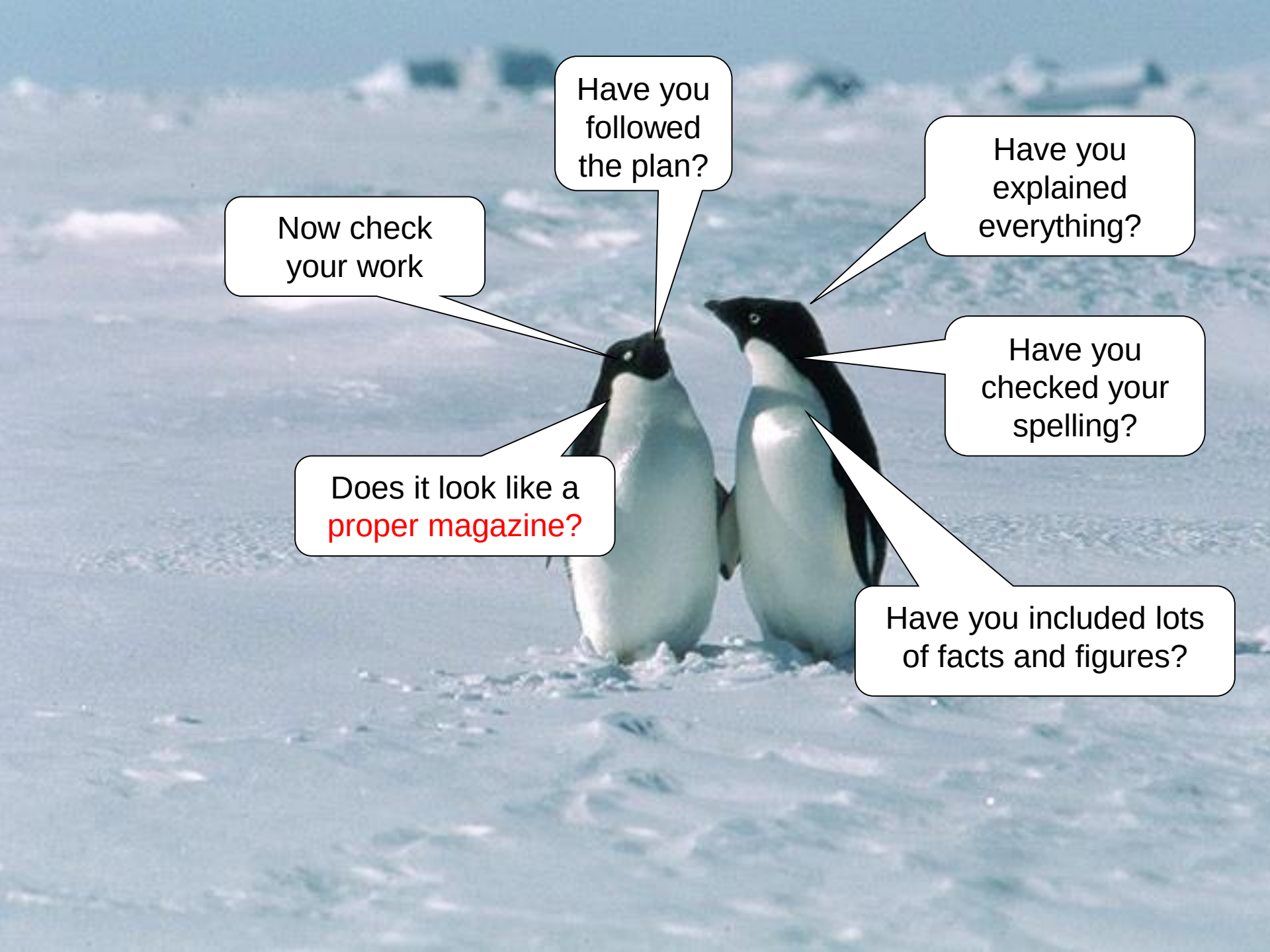
Tourists visiting Antarctica

Hands off Antarctica!

Tony Hayward….
Boss of the big oil company BP


What do you think?
Why do you think that?
What is the future for Antarctica?


What makes Antarctica a fragile environment?
How should Antarctica be managed to protect the environment?
Is Antarctica under threat? Why?
Which are the most immediately vulnerable parts of Antarctica? What are they at risk from
How have the activities of those countries with research bases in Antarctica affected the environment there?


Have you followed the plan?
Have you explained everything?
Now check your work
Have you checked your spelling?
Does it look like a proper magazine?
Have you included lots of facts and figures?