



Space

Collecting information about conditions at the poles can be difficult. Satellites spinning around the earth are being launched this year to collect more data, especially about sea ice patterns and the hole in the ozone layer. Scientists are also trying to set up better star observatories at the poles. You can launch a 'virtual balloon' into space by doing some activities like the ones listed here, or others listed at the IPY website:

http://www.ipy.org/index.php?/ipy/detail/ipy_2007_2008_school_launch_event)

Atmosphere

The atmosphere above Antarctica is very important since much of the earth's climate is controlled by air and ocean currents moving from here. The other important thing that we measure in Antarctica is the size of the hole in the ozone layer. The hole was caused by CFCs and other chemicals. It is thought it will disappear by 2060, but meantime it is letting UV radiation reach the earth. Sun screen cuts down the effect of UV radiation.

Try testing a range of products:

- * Collect some plastic containers such as takeaway food dishes. The flat round ones work best. Smear the inside base with sun screen. Repeat with other dishes for other sun screens. Put the dishes on top of a newspaper. Leave in the sun for a week. Come back and check how much the print has faded under each sun screen. Which one do you think worked best?

Other things to try:

- * Make dew and frost using moisture from the air. Collect a cup, ice and salt. Put the ice in the cup. Dew will form on the outside of the cup because the air beside the cup cools down and condenses on the cup as water. Turn the dew into frost by adding salt to the ice. The ice will get colder and make the water on the outside of the cup freeze.
- * The closest we can get to knowing what the weather is like in Antarctica is to visit a mountain in winter. Organise to visit Mt Wellington, Cradle Mountain, Mount Field National Park or Ben Lomond. Dress for the conditions! Have a go at building snowmen or go tobogganing.



Polar Explorer



Sail on the 'Pilosa'

Welcome to our ship as we sail off to explore the Polar areas. Our ship is named 'Pilosa' for two reasons. Firstly, its letters stand for the themes to explore in the International Polar Year (IPY). They are

P
e
o
p
l
e

I
c
e

L
a
n
d

O
c
e
a
n
s

S
p
a
c
e

A
t
m
o
s
p
h
e
r
e.



As well, *pilosa* is a Latin word meaning hairy, and hair, wool and fur keep us warm. And boy, will it get cold as we continue our journey! Here are six challenges for each of the themes.

How you tackle this challenge is your choice. Maybe you want to just choose one theme and become a specialist. Maybe you want to try something from each theme.

It's over to you to plan your trip and get under way!

People

People who live in polar areas need to keep warm:

- ☺ Make some soup and put it in mugs, one for each person. Cover the top with plastic wrap to keep it clean. Your challenge is to keep it hot for an hour! Imagine the soup mug is a foot and 'dress' it in suitable clothing. You might try woollen socks, or plastic garden boots, or ... Make each mug of soup wear different 'clothes'. Whose soup is still warm enough at the end?



Other things to try:

- ☺ Make a model igloo using mini marshmallows or ice cubes
- ☺ Find out the jobs that people do and run mock interviews for positions at Casey Station, a research station in Antarctica.

Ice

Ice at the poles can be frozen fresh water from glaciers or frozen salt water from oceans. The amount of each is important because they freeze at different temperatures. The frozen water controls ocean currents. Fresh water freezes at 0°C. Salt water freezes at - 2°C. You can show the difference that salt has on temperature by making chocolate custard ice cream:

- ≈ Collect a tub of chocolate custard, a plastic snack size sealable bag, a plastic sandwich size sealable bag, crushed ice and cooking salt. Put a few tablespoons of custard in the snack size bag and make sure it is well sealed. Put the snack bag in the sandwich bag then add ice and salt to fill the sandwich bag (about 2 cups of ice to 2T of salt). Seal the bag and wrap it in a towel to stop your hands getting cold. Shake it for 5 minutes.

Other things to try:

- ≈ Try to make ice cream without adding salt to the ice.
- ≈ You can make sherbet by freezing pineapple juice.
- ≈ Use a 500g coffee tin instead of the sandwich bag, half fill it with ice/salt mix, add a tetra pack of custard and fill it up with more ice/salt. Seal it well then roll the tin around the ground like a soccer ball. Check it out after ten minutes for rock 'n' roll ice cream ...



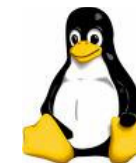
Land

Animals near the North Pole live on land that is permanently frozen for most of the year. Getting around on snow and ice is very different to getting around on soil or grass.

- * Try ice blocking on a grassy bank compared to sliding down a plastic strip. If you can't make large ice blocks, you can do a similar test using a large sheet of cardboard from a carton.

Other things to try:

- * Watch the movie *Ice Age 2* and imagine what it would be like for the Arctic animals if the ice all melted.
- * Try cross country skiing, grass skiing or 'skiing' in the hall using paper plate snow shoes.



Oceans

Near Antarctica, the water rises up and conditions are great under the sea ice for tiny phytoplankton to grow. These are eaten by tiny prawn-like animals called krill. Krill are very good food. They are eaten by seals, whales, birds, fish, penguins, squid and zooplankton. Get an idea of the importance of krill to whales by making a krill-mobile:

- ≈ Collect two 10 cm squares of cardboard, a reel of strong cotton, a needle, old printed paper (e.g. a damaged book), scissors and a picture of a whale.
- ≈ Cut out a whale shape on one of the cardboard squares, and tie it to a 30 cm long cotton thread near its head. Tie a figure-of-eight knot above the whale then use the needle to place the whale thread through the exact centre of the other cardboard square so that it rests on the knot. Tie a second knot above the cardboard. Then make a loop at the thread end.
- ≈ Now make a meal for your whale! Cut krill shapes as strips from the printed paper, 5mm wide and 40mm long. Thread them on cotton threads of different lengths, ten krill per thread, so that they hang under the cardboard square around the whale. Add as many as you like to make the mobile look good. (A large whale can eat half a million krill per meal. I reckon you won't want to make that many!)

Other things to try:

- ≈ Watch the movie *Happy Feet*. (In fact, the penguins eat more krill than fish in real life.)
- ≈ You could make the mobile above with a penguin in the centre instead of the whale.