Antarctica
“The Last Wilderness”
Welcome to TAS (Tanglin Antarctic Survey) as a new geographical technician you will need to get up to speed on life in Antarctica as quickly as possible. Perhaps one day you will make it to the mainland, meanwhile use the links below to initiate your research.

http://en.wikipedia.org/wiki/Antarctica
http://www.coolantarctica.com/
http://www.discoveringantarctica.org.uk/

1. Where is Antarctica? Describe the location.
2. Who was the first person to reach the South Pole?
3. What is the latitude of the South Pole?
4. What lines of longitude meet at the South Pole?
5. What countries claim rights to Antarctica?
6. What country is the nearest to Antarctica?
7. What country has control of the base at the South Pole?
8. What is the name of the mountain range in Antarctica?
9. What is the highest mountain on Antarctica?
10. What oceans would you travel through going from Singapore to Antarctica?
11. What is the coldest temperature ever recorded on Antarctica?
12. How many South Pole’s exist? What are their names?
13. Antarctica has the lowest/highest level of humidity.
14. Antarctica has the lowest/highest average altitude.
15. Antarctica has the lowest/highest temperature ever recorded.
16. Antarctica has the lowest/highest population per continent.
17. How many seas surround Antarctica? What are their names?
18. What is the only direction that you can go from the South Pole?
19. Name the two large ice shelves that flow out from Antarctica.
20. If you were to travel along the 30ºW longitude line from Antarctica, which continent would you reach? ………………………………….. If you were to travel along the 150ºW longitude line from Antarctica, which continent would you reach? …………………………………..

Now add your own questions!

a.

b.
Use an atlas to fill in the blank details on the map below.

Google Earth - Antarctica
Go to Google Earth and get an image of Antarctica and paste it here.

Is there lots of detail in Google Earth for Antarctica?
Go up to the top toolbar and open **VIEW** then click on **GRID**. This will add a layer of lines of **longitude** and **latitude**.

1. Does all of Antarctica lie within the **Antarctic Circle**?  
   ............................... Make a copy of the image and paste below

2. Use the ruler tool to measure the **widest part** of Antarctica. ............km

3. How far is it from Singapore to the South Pole? .................................km

4. Use the ruler tool again, start on Singapore and measure a line **north** from Singapore using the measurement you found of the **width** of Antarctica.

5. Make a copy of the image and paste below.

To explore Antarctica more open up the left tool bar and look in the **layers** section. **Click Gallery** and you will see more icons. Use these to answer the following.

6. Are there any **Volcanoes** on Antarctica?

7. **Click on the 360 icon,** Find Scott’s hut at Terra Nova, click and go into the **360**. Take a snapshot of the view from Scott’s Hut. Paste your view here....
"Great God! This is an awful place," – What happened to Scott?

Robert Falcon Scott 1912

Who was this man? What did he do? Why did he write the above?

http://www.coolantarctica.com/Antarctica%20fact%20file/History/Robert%20Falcon%20Scott2.htm

ISCE 2012

What is this? Find out what these people are doing. Follow them - where are they and what is it like?


http://www.isce2012.co.uk/
Selling Antarctica

- Size – 15 million sq. kilometres (45 times the size of G.B.).
- Antarctica is found almost entirely south of the Antarctic circle (66° south).
- Ice depth – over 3000m in the Bently Subglacial Trench.
- Average ice depth – 2,500m (Ben Nevis is 1,343m).
- 98% covered by ice.
- The weight of the ice is so great that it has made a deep hollow in the land surface.
- Antarctica doubles its size during the winter when sea ice forms around the edges.
- Highest point – Vinson Massif 5,140m.
- First person to realise Antarctica was there – Captain James Cook.
- First person to reach the South Pole – Roald Amundsen Dec. 14 1911.
- Coldest temperature -89.2° C at the USSR base Vostok 1983.
- Average temperature -15° C on the coast, -50° C inland.
- Boiling water would freeze instantly on Antarctica.
- Contains 90% of the world’s fresh water (frozen as ice).
- If all the ice melted, world sea level would rise by 90m.
- The Southern Ocean surrounds Antarctica. This is made up of parts of the Atlantic, Pacific and Indian Oceans.
- No trees, only about 350 species of mosses, algae and lichens.

- Seven species of penguin live and breed within the Antarctic region.
- The waters surrounding Antarctica are home to the blue, fin, sei, mink, humpback, sperm and orca whales.
- First person born on Antarctica was Emilio Palma on January 7th 1978.
- Resources and minerals found around and under the ice include; oil, coal, copper, gold, manganese, silver, lead, zinc and titanium.
- There are no polar bears on Antarctica, they are found around the North Pole.
- The Ross Ice Shelf is the size of the state of Texas in the USA.
- In the last 20 years more than 9,000 meteorite fragments have been found on the ice sheet.
- The ‘aurora australis’ or southern dawn is a spectacular natural light phenomenon that is seen in the sky over Antarctica.
- Scientists now think the size of Antarctica is getting smaller due to the ‘greenhouse effect’ – the earth getting warmer.

**TASK**

Why are countries so keen to claim parts of Antarctica? Using the information in the fact file, maps and any other details you can find sell Antarctica as if it were a property in an estate agency. Find out what it has that countries are so keen to get. Fill in the sheet over the page with your work.
Use this page to plan out your Estate Agents poster selling Antarctica.
HOW COLD IS IT AT McMURDO STATION?

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>J</th>
<th>F</th>
<th>M</th>
<th>A</th>
<th>M</th>
<th>J</th>
<th>J</th>
<th>A</th>
<th>S</th>
<th>O</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation (mm)</td>
<td>15</td>
<td>21</td>
<td>24</td>
<td>18</td>
<td>24</td>
<td>25</td>
<td>16</td>
<td>11</td>
<td>12</td>
<td>10</td>
<td>10</td>
<td>16</td>
</tr>
</tbody>
</table>

The maximum temperature is _______ in the month of ____________________

The minimum temperature is _______ in the month of ____________________

The total precipitation for the year is ______________

Use the above figures to draw out a climate graph on the grid below

Precipitation is shown on a bar graph (Shade in blue)
Temperatures are shown as a line graph (Go over the line in red)

Extension - How different is the climate at the South Pole? Check this link!

http://www.coolantarctica.com/Antarctica%20fact%20file/antarctica%20environment/climate_graph/vostok_south_pole_mcmurdo.htm
Life at the South Pole can be Dark

Complete the following statement and table:

On June 21st it is ................................ in the northern hemisphere, and ................................ in the southern hemisphere. On this day everywhere ................................ of the Arctic Circle has 24 hours of daylight and everywhere south of the Antarctic Circle has 24 hours of darkness.

On December 21st it is winter in the ................................. hemisphere, and summer in the ................................. hemisphere. On this day everywhere north of the Arctic Circle has 24 hours of .................................. and everywhere south of the ................................. Circle has 24 hours of daylight.

If you are going to walk to the South Pole it would be best to do it when the South Pole has .................................

How do the hours of daylight and darkness change at the South Pole throughout the year?

<table>
<thead>
<tr>
<th></th>
<th>North Pole Dec 21st</th>
<th>North Pole June 21st</th>
<th>South Pole Dec 21st</th>
<th>South Pole June 21st</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of Darkness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours of Daylight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Hint – use 0 or 24 only*
Antarctica has an abundance of animal life, almost all of it being dependent on the sea; in fact the largest truly land animal is a wingless midge about 13mm / 0.5 of an inch long. As the animal life is dependent on the sea and are mainly warm blooded, they tend to be pretty large as a survival technique against the extreme and relentless cold. That Antarctica can support such an abundance of large animals is a result of the productivity of the southern polar sea.

Just who are the natural inhabitants of Antarctica? Make a list of some of the key players!
http://www.coolantarctica.com/Antarctica%20fact%20file/antarctica_animal.htm

Who’s eating who? What is Krill? Why is it important?
What is a food web? Find out what food webs look like from Antarctica. Paste a copy of one here. Who is at the top and the bottom? [http://www.bigelow.org/edhab/game.html](http://www.bigelow.org/edhab/game.html)

**Antarctic Wildlife - what can you find out?**

<table>
<thead>
<tr>
<th>My favorite penguin picture</th>
<th>Fantastic facts!</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Penguin" /></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical adaptions</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Behavioral adaptions</th>
<th></th>
</tr>
</thead>
</table>

My favorite whale picture

Fantastic facts!

Physical adaptions

Behavioral adaptions


Extension task - What could happen to upset the Antarctic ecosystem and food webs?

Here is a board game based on Antarctica. Have a look at it! In groups design and make a game on the natural world of Antarctica.

Game plan - Title........................................................................................................................................
What is life like at the South Pole?

http://www.usap.gov/videoclipsandmaps/spwebcam.cfm
http://en.wikipedia.org/wiki/Amundsen%E2%80%93Scott_South_Pole_Station

1. What is at the South Pole? Use the webcam - find out what’s there right now!
2. Find out the weather right now, go to Google Earth and click on the weather icon!
Human Antarctica: would you like to work there?

Could you work in Antarctica? ........................................
Are there any jobs available? [http://www.antarctica.ac.uk/employment/vacancies/index.php]

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Read the following details from Rebecca, a field assistant on Antarctica

Mountains to climb

“Basically my role is to take scientists off station, give them the training they need to operate safely while doing their research, and then look after them while we’re in the field. I’m called a Field Assistant, but essentially I’m a mountaineer. In three field trips this season, I’ve been involved in some fascinating work that I could never experience in the UK. The first place was called Mars Oasis, where scientists were measuring the impact of climate and UV on flora and fauna. Another took me to the South Shetland Islands via HMS Endurance and her Lynx helicopters; and the third saw me supporting a pair of palaeolimnologists who were collecting samples for climate analysis dating back 10,000 years.”

A long-term passion

“About four years ago, I was offered a job here; but because I was offered a chance to teach at the same time, I chose to do that. But ever since university, I’ve yearned to ‘go South’ to see something of the Antarctic, but also to gain and improve my polar skills and join up with some people with similar ambitions.”

The reality of life

“Out in the field, things can change quickly. Sometimes everything is a rush as you try to make the most of a weather window or get everything done for when the aircraft arrives. At other times, you have to wait while data is collected; field equipment fixed or the weather closes in.

But it’s not just about work. The experience is much broader and I’ve learnt carpentry skills, cooking tips, taken a few Spanish lessons and enjoyed various forms of skiing. Of course, it can be hard being cooped up sometimes. But where else can you get an experience like this?”

Most of the jobs in Antarctica are related to research, which involves lots of geography. Look at the following to see what it is like to live in Antarctica.

[http://www.antarctica.ac.uk/living_and_working/index.php]
You are going to apply for a job as a Field Assistant with the British Antarctic Survey. The job of a Field Assistant is to look after the scientists while they are collecting data and carrying out experiments in the dangerous Antarctic conditions. You may send a video application or write your application.

http://www.ellsworth.org.uk/

Dear Sir or Madam,

Why are you writing? What job are you applying for?
Where did you see the vacancy advertised.

A little about you, what you are doing now or have done recently that will fit with the job

Why you can do the job? What experience, achievements do you have?

Why do you want to work in Antarctica? What attracts you to the job?

I look forward to hearing from you shortly, in the meantime, should you have any queries, or wish to discuss my application further, please do not hesitate to contact me on......

Yours faithfully,
You are not adapted for survival in the cold like the wildlife. How would you survive the cold?

Work in groups for the following task.

Find out about surviving in Antarctica by using the following links. Produce a guide poster or leaflet on how to survive. One member of your group must come dressed to survive Antarctica for your next lesson.

http://www.coolantarctica.com/Antarctica%20fact%20file/science/clothing_in_antarctica.htm
http://www.discoveringantarctica.org.uk/multimedia/flash/5_whatnot.html
CONGRATULATIONS! You got the job!

Living and working in Antarctica?

Could you work here?

What would it be like to work in Antarctica? Write an email home to your family, describing your work and living conditions.

a. Your job: BAS Ice core researcher/biologist?
b. Clothes: Lots of them!
c. Home: Rothera Research Station and Tent
d. Length of stay: 12 months - 3 weeks in a tent
e. Home comforts: ?
f. Leisure time: Skiing
f. Colleagues: 9 and 1 million penguins!!!
COLD TOURISM

In the 2010/11 season Antarctica received over **33,000** tourists. These tourists arrived in boats and planes and actually went on to the mainland of Antarctica.

Would you like to do this? Or do you think tourists should be kept away and not encouraged to visit Antarctica?

Use the data in the table below to complete the pie chart to show the origin of the tourists who visit Antarctica. Or complete on excel (your Antarctic Training Manager will assist you here).

<table>
<thead>
<tr>
<th>Origin of tourist arrivals</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>37</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
</tr>
<tr>
<td>Canada</td>
<td>8</td>
</tr>
<tr>
<td>UK</td>
<td>8</td>
</tr>
<tr>
<td>Germany</td>
<td>7</td>
</tr>
<tr>
<td>Japan</td>
<td>3</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>24</td>
</tr>
</tbody>
</table>

What does this data tell you about the tourists that are visiting Antarctica?

…………………………………………………
…………………………………………………
…………………………………………………
…………………………………………………
…………………………………………………
…………………………………………………
…………………………………………………

Each division represents 10%
If you were a tourist on Antarctica what would you tell your relatives and friends back home?

Could you send an email or sms or get onto facebook on Antarctica? .................................................................
Pick a picture for your postcard and paste below. Is it as good as these?

Polar bears finally migrate to Antarctica
Protecting Antarctica

Antarctica’s status is regulated by the 1959 Antarctic Treaty and other related agreements, collectively called the Antarctic Treaty System. For the purposes of the Treaty System, Antarctica is defined as all land and ice shelves south of 60° S. The treaty was signed by twelve countries, including the Soviet Union (and later Russia), the United Kingdom, Argentina, and the United States. It set aside Antarctica as a scientific preserve, established freedom of scientific investigation, environmental protection, and banned military activity on that continent.

What countries claim they have land at Antarctica? Paste their flags here!

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 1</td>
<td>The area is to be used for peaceful purposes only; military activity, such as weapons testing, is prohibited, but military personnel and equipment may be used for scientific research or any other peaceful purpose.</td>
</tr>
<tr>
<td>Article 2</td>
<td>Freedom of scientific investigation and cooperation shall continue.</td>
</tr>
<tr>
<td>Article 3</td>
<td>Free exchange of information and personnel in cooperation with the United Nations and other international agencies.</td>
</tr>
<tr>
<td>Article 4</td>
<td>Does not recognize, dispute, or establish territorial sovereignty claims and no new claims shall be asserted while the treaty is in force.</td>
</tr>
<tr>
<td>Article 5</td>
<td>Prohibits nuclear explosions or disposal of radioactive wastes.</td>
</tr>
<tr>
<td>Article 6</td>
<td>Includes under the treaty all land and ice shelves south of 60 degrees 00 minutes south.</td>
</tr>
<tr>
<td>Article 7</td>
<td>Treaty-state observers have free access, including aerial observation, to any area and may inspect all stations, installations, and equipment; advance notice of all activities and of the introduction of military personnel must be given.</td>
</tr>
<tr>
<td>Article 8</td>
<td>Allows for jurisdiction over observers and scientists by their own states.</td>
</tr>
<tr>
<td>Article 9</td>
<td>Frequent consultative meetings take place among member nations.</td>
</tr>
<tr>
<td>Article 10</td>
<td>Treaty states will discourage activities by any country in Antarctica that are contrary to the treaty.</td>
</tr>
<tr>
<td>Article 11</td>
<td>Disputes to be settled peacefully by the parties concerned or, ultimately, by the International Court of Justice.</td>
</tr>
<tr>
<td>Articles 12, 13, 14</td>
<td>Deal with upholding, interpreting, and amending the treaty among involved nations.</td>
</tr>
</tbody>
</table>

Source: Richard Allaway
Complete the table on this page and use it to explain why you think each of the articles of the Antarctic Treaty exists. The first one has been done for you.

<table>
<thead>
<tr>
<th>Article</th>
<th>Summary of Article</th>
<th>Why do you think it is included in the Treaty?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only peaceful uses.</td>
<td>So that there is no pollution from military exercises or testing. No military personal present that might get involved with a 'land grab'.</td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12, 13 &amp; 14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Use the T-shirt above to plan out your ideas. Collect a large A3 copy of the T-shirt to draw your design. Good luck!