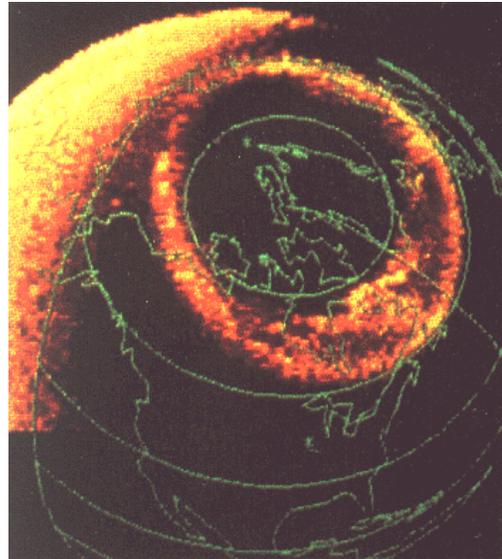
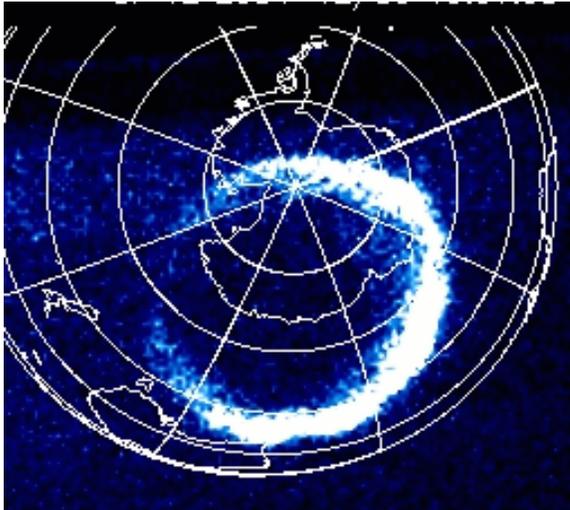


The North and South Magnetic Poles.

The aurora form a glowing halo of light above Earth's North and South Polar Regions. Because aurora are caused by charged particles that are affected by Earth's magnetic field, the Auroral Ovals are centered in Earth's magnetic poles, not its geographic poles about which the planet rotates.

The photos below, were taken of the two polar aurora by the IMAGE FUV (Left) and the Polar (right) instruments. The data has been colorized to bring out details of interest to scientists.



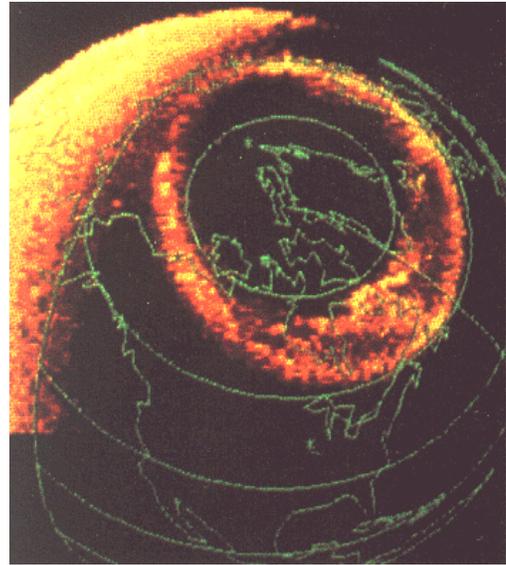
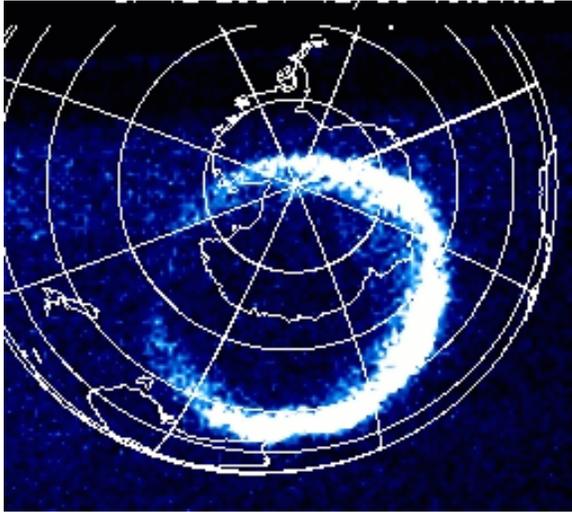
Question 1 - The South Magnetic Pole is located in the Northern Hemisphere. From the appropriate image above, locate this magnetic pole on a map.

Question 2 -- The North Magnetic Pole is located in the Southern Hemisphere. From the appropriate image above, locate this magnetic pole on a map.

Question 3: -- From the geographic clues in the map, estimate the diameter of the auroral oval in kilometers. (Hint: The radius of Earth is 6,378 kilometers)

Question 4: – What interesting geographic features would you find if you traveled to each of the magnetic poles? If you were going to undertake an expedition to each pole, describe your journey starting from your city or town and mention any special or unusual gear you would bring.

Question 5: Using a compass, and the idea that likes repel and opposites attract, why don't the names of the magnetic poles match the hemispheres they are in?



Question 1 - The South Magnetic Pole is located in the Northern Hemisphere. From the appropriate image above, locate this magnetic pole on a map.

Answer: *The right-hand image from the Polar satellite shows the Arctic Region and the contours of Greenland and North America/Canada. From a world map, students can estimate that the center of the auroral oval is near longitude 105 West and latitude 83 North)*

Question 2 -- The North Magnetic Pole is located in the Southern Hemisphere. From the appropriate image above, locate this magnetic pole on a map.

Answer: *The left-hand image from the IMAGE satellite shows Antarctica. The center of the auroral oval is near longitude 110 West and latitude 72 South.*

Question 3: -- From the clues in the map, estimate the diameter of the auroral oval in kilometers. (Hint: The radius of Earth is 6,378 kilometers)

Answer: *The diameter of each coordinate grid covers Earth, so the diameter of the grid is the diameter of Earth. Calculate the scale of each image (kilometers per millimeter) and multiply by the diameter of each auroral oval in millimeters. For the north polar aurora, its diameter is about 6400 kilometers. For the south polar aurora, the diameter is about 6,000 kilometers.*

Question 4: – What interesting geographic features would you find if you traveled to each of the magnetic poles? If you were going to undertake an expedition to each pole, describe your journey starting from your city or town and mention any special or unusual gear you would bring.

Answer: *Accept any reasonable answer related to icy climates (Antarctica – permanent ice) or the north polar sea (ice or water location depending on season)*

Question 5: Using a compass, and the idea that likes repel and opposites attract, why don't the names of the magnetic poles match the hemispheres they are in?

Answer: *In the Northern Hemisphere, the 'N' on the compass is a north-type magnet by the way we defined the naming convention for magnets, so it will be attracted to a south-type pole, which is therefore the polarity of the pole in the Northern Hemisphere.*