

**Worksheet: A VIRTUAL VISIT TO THE TOP OF THE WORLD**

*This exercise will introduce you to polar oceanography and how events that occur in oceans thousands of kilometers away affect you in the mid-latitudes.*

A. If you traveled to the North Pole, what would conditions be like there? Would you be able to stand on solid land? Ice? Would you be floating on open-ocean? If you are standing on ice, what is under that ice? Write your thoughts below.

B. What do you think the weather is typically like? How cold is it? Is it typically stormy or fair?

C. Identify the latitude at the North Pole.

**90 ° N**

D. How far is the North Pole from your community? Express your answer in kilometers. To help you answer this question, visit a geocoding Web site such as <http://www.wunderground.com> or <http://geocoder.us> to help you find the latitude and longitude of your community. You may also look at the page "**U.S. Map.**" You may use the relationship that 1 degree of latitude equals approximately 110 kilometers to calculate your distance.

**This provides an opportunity to discuss why longitude is irrelevant to this particular calculation: Regardless of the students' home longitude, travelling to the North Pole means you are travelling due North, thus to determine distance in kilometers, you only need to know the latitude of the North Pole (90°N) and the students' own latitude. You may wish to use a globe to illustrate the concept that it does not matter where (which longitude) you are starting from.**

E. Look at the images at [http://www.arctic.noaa.gov/gallery\\_np.html](http://www.arctic.noaa.gov/gallery_np.html) (both real-time and archived) or look at the images on the page "**Images from the Arctic.**" Do these pictures help you to answer any of the questions you've pondered? Do they raise any additional questions? If so, add those questions below.

**The North Pole appears to be an ice-covered barren region. The ice however is only 2-3 meters thick, covering a vast ocean beneath.**

F. Look at the page "**North Pole Weather Data From 2007**" or view real-time weather data (graphical format) for the North Pole at [http://www.arctic.noaa.gov/gallery\\_np\\_weatherdata.html](http://www.arctic.noaa.gov/gallery_np_weatherdata.html). What is the average summer temperature at the North Pole?

**From this chart, the average temperature is -1°C between June and August. Temperatures range from an average of 0°C in July to -35°C in February.**

G. If you have access to the internet, visit this interactive world climate data map: <http://www.climate-charts.com/World-Climate-Index-Map.html>. Locate the nearest reporting station to the North Pole. What is the name of this reporting station and how much annual precipitation is received there?

H. Use the same map to find the reporting station closest to your school. How much annual precipitation is received where you live?

**Minimal precipitation is received near the North Pole. This provides the opportunity to extend the lesson and study global climate patterns and identify the poles as a "frozen desert" where atmospheric subsidence guarantees (part of the global atmospheric circulation) minimal precipitation year-round.**

**Additional student questions raised may include:**

**1) Why are all the pictures from April – September? (This question opens the door to extend the lesson and explore the day/night pattern observed at the North Pole and the solar elevations observed during the 6 months of observed daylight. A possible graphic and explanation that can be used to initiate discussion is available at: <http://www.divediscover.whoj.edu/circulation/infomod.html>.)**

**2) Is the North Pole windy? (Yes.)**

**3) What life form(s) are found in the vicinity of the North Pole? (Polar bears and much more.)**

**4) How long are the days and nights? (Keep students focused on the lesson so they think about the fact that it is cold, dark for half of the year, and when the sun is above the horizon, it is not far above the horizon – ask students what kinds of polar ocean conditions result from this set of conditions?)**