Student Worksheet: Latitude and Longitude

Teacher Introduction

In the Target Moon mission students locate bases using latitude and longitude as reference points. Plotting the possible points of impact will require students to accurately predict the path of the comet and determine the areas of ejecta at each location in order to move the astronauts to safety.

A good understanding of latitude and longitude is essential to the Target Moon mission. This lesson reviews information usually covered in a social studies class but embeds it in a space science scenario with an approach that integrates it with science and math.

Duration

60 minutes

Materials

Student worksheet

U. S. or world map with latitude and longitude lines

Pencils

Paper

Vocabulary

equator: a circle of the Earth or celestial body that is equally distant from the two poles and divides the surface into northern and southern hemispheres.

latitude: the distance north or south of the equator.

longitude: the distance east or west of the prime meridian.

prime meridian: the meridian of 0 degrees longitude which runs through the original site of the Royal Observatory at Greenwich, England, and which forms the reference point for lines of longitude east and west.

Latitude and Longitude Review

Latitude is the distance north or south of the equator; imaginary lines measured in terms of 360 degrees of a circle help us locate points or locations on a sphere like Earth or the moon.

The equator is the line of 0 degrees latitude. Lines of latitude start from the equator and go north to the North Pole and south to the South Pole. The North Pole is labeled 90 degrees north latitude and the South Pole is 90 degrees south latitude. The latitude of every point in between must be some degree north or south from 0 to 90 degrees. One degree of latitude covers about 69 miles, or 111 kilometers.

These lines are called parallels of latitude because they run parallel to the equator.

Longitude

Longitude is the distance east or west of the prime meridian; imaginary lines measured in terms of 360 degrees of a circle help us locate points or locations on a sphere like Earth or the moon.

Longitude is measured the same way as latitude except that the lines run east and west. Lines of longitude are called meridians and just as latitude must have a starting reference line. Longitude lines begin at 0 degrees at the line that runs through Greenwich, England. This line is internationally accepted as the 0 degree longitude and is known as the prime meridian.

For even greater accuracy degrees of latitude and longitude are further divided into 60 minutes, and minutes are divided into 60 seconds. Students will not have to measure in minutes or seconds for their Target Moon mission.

Finding Locations

When you use a map to locate a position, you often use the degrees of latitude and longitude. These are called coordinates. If you know the coordinates of a point, you can use a map marked off in latitude and longitude to locate any point on the sphere.

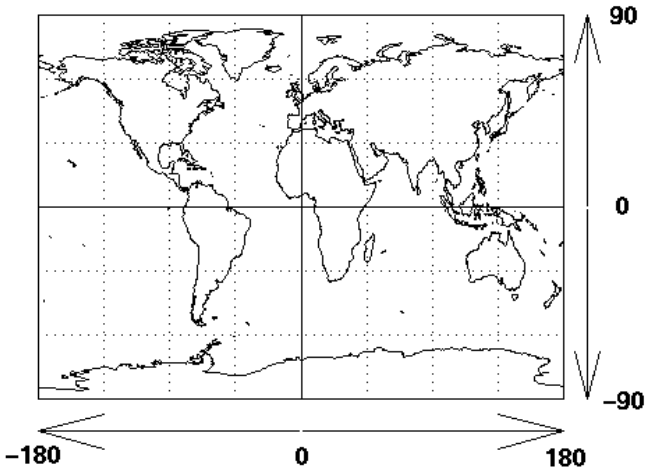

Image: http://jwocky.gsfc.nasa.gov/teacher/latlon.html

To identify locations with their coordinates (latitude and longitude) or to find locations using latitude and longitude, you must know how the lines are defined. Latitude is measured from the equator with positive values going north and negative values going south.

Longitude lines are measured from the prime meridian with positive values going east and negative values going west.

Procedure

1) Read the information about latitude and longitude in this lesson.

2) Find a city that you would like to visit and identify its latitude and longitude.

3) Write the coordinates on a piece of paper and trade coordinates with a classmate.

4) Your classmate is to identify the city you would like to visit using its latitude and longitude while you identify the city your classmate would like to visit.

5) If you both correctly identified the cities, move on to the next location. You can choose from the list below and add others of your own.

Locations to find:

- A city you would like to visit.
- The city in which you were born.
- The city in which a parent was born.
- Where you would like to vacation.
- Where you would like to live one day.
- Where your favorite sports team is located.
- The farthest place you have visited compared to where you live now.