



# Where in the World?

## Plotting Latitude & Longitude

### Background

Because our planet is a sphere, we need two types of reference lines to locate positions on the Earth and to make accurate maps. These imaginary lines are called *parallels of latitude* and *meridians of longitude*. The primary reference line of latitude is the *Equator*, and the primary reference line of longitude is the *Prime Meridian*.

### Summary

After learning the basics about latitude & longitude, students will plot locations on a map and answer questions about coordinates.

### Target Audience

Grades 6-7

### Time Required

Approximately 40 minutes.

### Florida State Social Studies Standards

**SS.6.G.1.4:** Utilize tools geographers use to study the world

**SS.6.G.1.1:** Use latitude & longitude coordinates to examine relationships

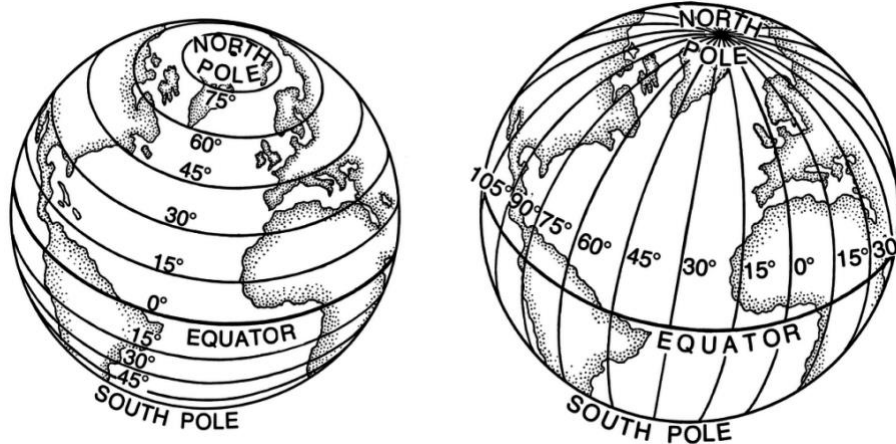
### Contents and/or Materials

World map

## Where in the World? A Lesson on Latitude and Longitude

### Background:

Because our planet is a sphere, we need two types of reference lines to locate positions on the Earth and to make accurate maps. These imaginary lines are called *parallels of latitude* and *meridians of longitude*. The primary reference line of latitude is the *Equator*, and the primary reference line of longitude is the *Prime Meridian*.



The Equator is an imaginary reference line drawn around the Earth halfway between the North and South poles. The Earth rotates daily on its axis, and the North and South poles are the two points where the axis enters and exits the Earth. Latitude is the distance measured in degrees, from 0 degrees to 90 degrees, north or south of the Equator. Parallels of latitude encircle the Earth, parallel to the Equator and to each other.

Except for positions located right on the Equator (0 degrees), degrees of latitude are labeled to tell whether they are north or south of the Equator. For example, Seward, Alaska is at 60 degrees north latitude; while Rio de Janeiro, Brazil is at 22.9 degrees south latitude.

Meridians of longitude are imaginary reference lines that pass from the North Pole to the South Pole, running perpendicular to the Equator. The 0 degrees line, called the Prime Meridian, runs through Greenwich, England, and is the starting point for all other lines of longitude.

Lines of longitude are numbered East and West from the Prime Meridian. East and West longitude meet at the 180 degrees meridian (the International Date Line), which runs through the Pacific Ocean.

To pinpoint a location more precisely, degrees are further subdivided into minutes and minutes into seconds.

1 degree = 60 minutes

1 minute = 60 seconds

The lines of latitude and longitude form a global grid system from which you can locate any point. This system is essential for ships at sea, such as the *JOIDES Resolution*, because they cannot use landmarks or coastal navigation aids such as buoys or channel markers while out in the open ocean. The *JOIDES Resolution* uses satellite navigation when in the open ocean- information from multiple satellites is received to tell the captain & crew where the ship is and what direction to travel. However, a ship's crew does not want to solely rely on computer-based navigational aids- what if something happens that disables the computer system? For this reason, ships also use paper-based nautical charts as a backup.

### **Activity:**

In this activity, you will be given the latitude and longitude coordinates of multiple locations around the world and will then plot these locations on a world map.

### **Coordinates to Plot:**

- Brothers Volcano: 34.88°S, 179.08°E
- JAMSTEC (Japan Agency for Marine-Earth Science and Technology) \*home of the Kochi Core Center/Repository: 35.32°N, 139.64°E
- Bremen Core Repository: 53.10°N, 8.85°E
- Gulf Coast Core Repository at Texas A&M University: 30.61°N, 96.33°W
- GNS (Geological and Nuclear Sciences, New Zealand): 41.11°S, 174.55°E
- WHOI (Woods Hole Oceanographic Institution): 41.52°N, 70.67°W

### **Follow-up Questions:**

1. The lines running north-south represent degrees of \_\_\_\_\_, which is measured from the \_\_\_\_\_ in a(n) \_\_\_\_\_ and \_\_\_\_\_ direction. These lines are known as \_\_\_\_\_ of \_\_\_\_\_.
2. The lines running east-west represent degrees of \_\_\_\_\_, which is measured from the \_\_\_\_\_ in a(n) \_\_\_\_\_ and \_\_\_\_\_ direction. These lines are known as \_\_\_\_\_ of \_\_\_\_\_.
3. The geographic grid used on Earth is based on the division of a circle into \_\_\_\_\_ degrees. Each degree is divided into \_\_\_\_\_ equal parts called minutes; each minute is divided into \_\_\_\_\_ equal parts called seconds.
4. Latitude is numbered from \_\_\_\_\_ degrees at the Equator to \_\_\_\_\_ degrees at either pole.
5. Longitude is numbered from \_\_\_\_\_ degrees at the Prime Meridian to \_\_\_\_\_ degrees at the International Date Line.

