

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_\_

# Mapping the Earth

The Physical Setting: Earth Science

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## Lab Activity: Latitude and Longitude

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### INTRODUCTION:

The system that is used to locate and describe your position on Earth's surface is latitude and longitude. Originally used by cartographers for creating maps and captains for navigation on the open ocean, latitude and longitude has become a part of nearly everyone's daily life. Whether using turn-by-turn directions with your GPS device or locating a friend's location, latitude and longitude are the basis for many different applications in every day life.

### OBJECTIVE:

You will learn how to locate the star Polaris in the nighttime sky and to determine positions on Earth using the coordinate system of latitude and longitude.

### VOCABULARY:

Latitude

Equator

Polaris

Longitude

Prime Meridian

Geographic Poles

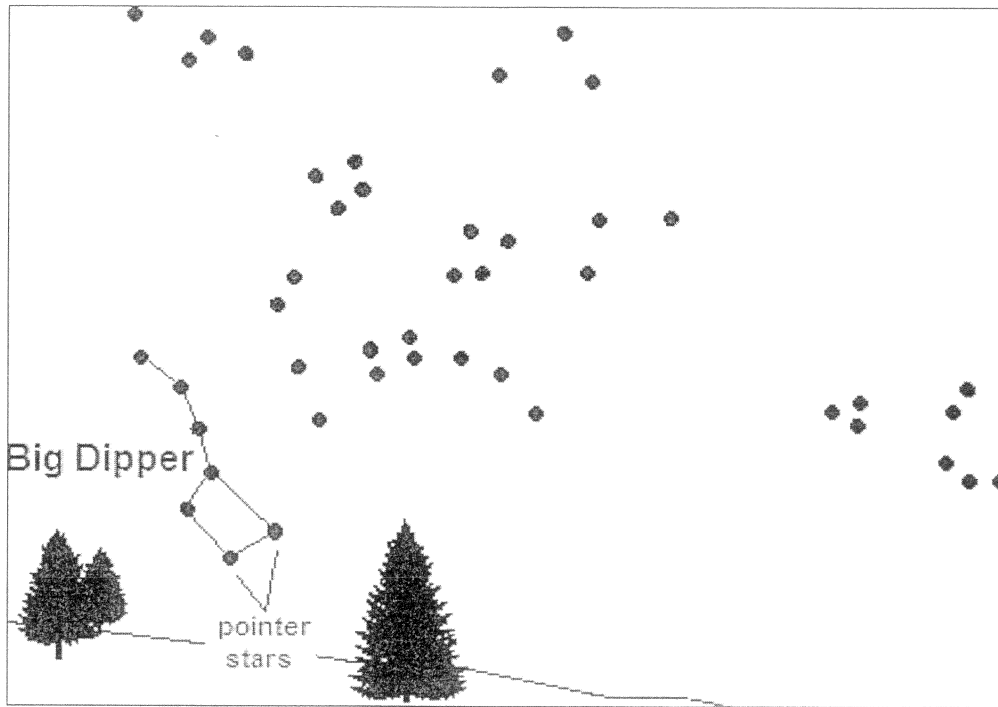
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## PROCEDURE A:

1. Locate the big dipper (bright group of stars in the constellation Ursa Major).
2. Following the pointer stars, move five times the distance that separates the pointer stars.
3. Circle the star and label it Polaris.
4. Label on the diagram (in the space provided) the direction an observer would be facing.

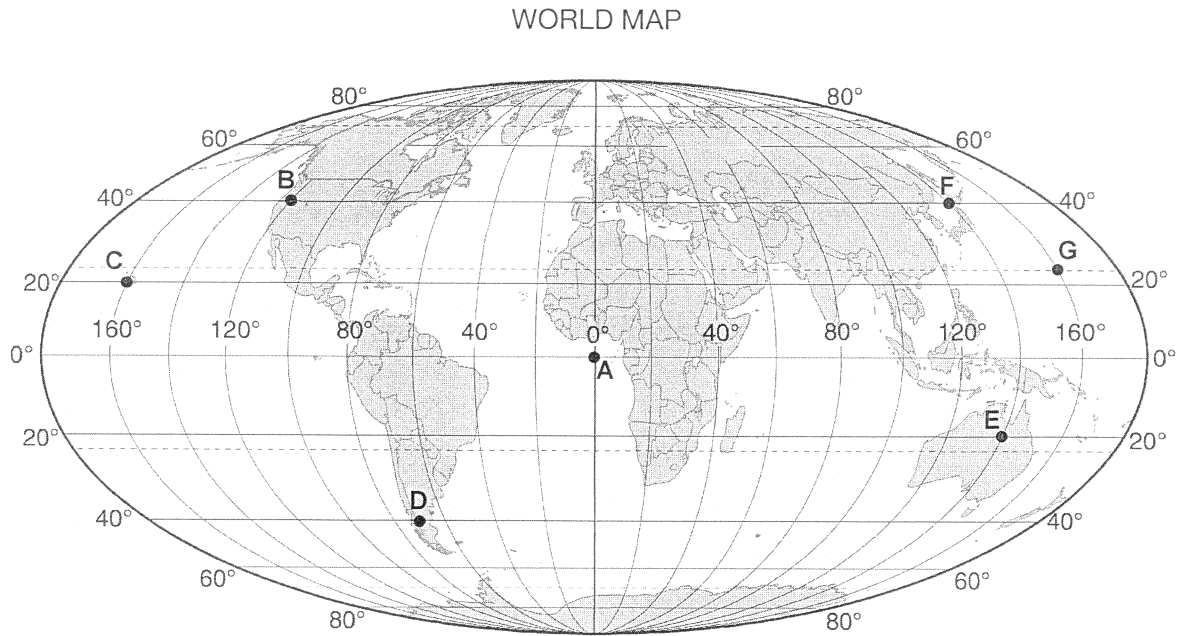


Observer's Direction: \_\_\_\_\_

# Lab Activity: Latitude and Longitude

## PROCEDURE B:

1. Trace over the Equator and Prime Meridian.
2. Use the World Map below to locate and record the approximate latitude and longitude coordinates on to Report Sheet 2 (include compass directions).



## REPORT SHEET 1

Location	Latitude	Longitude
A		
B		
C		
D		
E		
F		
G		

# Lab Activity: Latitude and Longitude

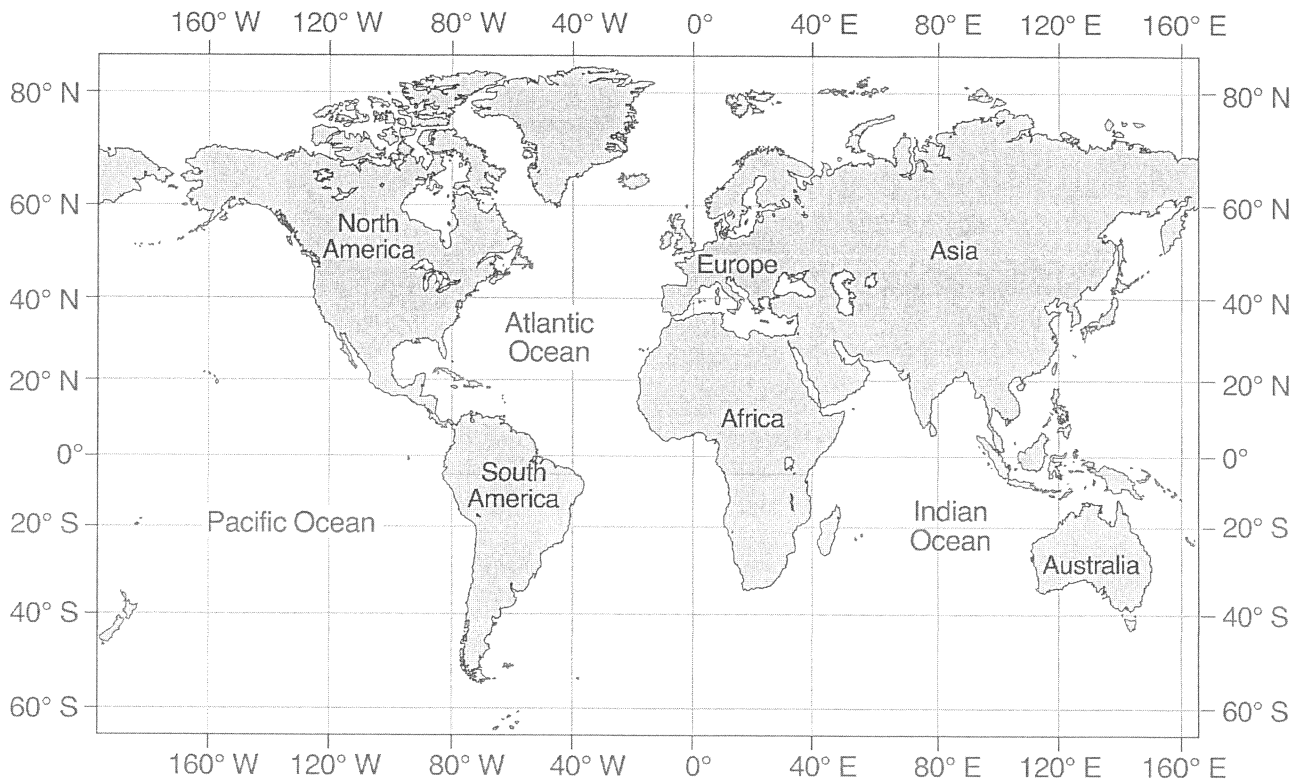
## PROCEDURE C:

1. Trace over the Equator and Prime Meridian.
2. Use the Data Chart and World Map provided below to plot the following latitude and longitude coordinates. Be sure to label each point with the correct letter.

DATA CHART

Location	Latitude	Longitude
A	40° N	160° W
B	40° S	40° E
C	20° S	80° W
D	80° N	120° W
E	0°	0°

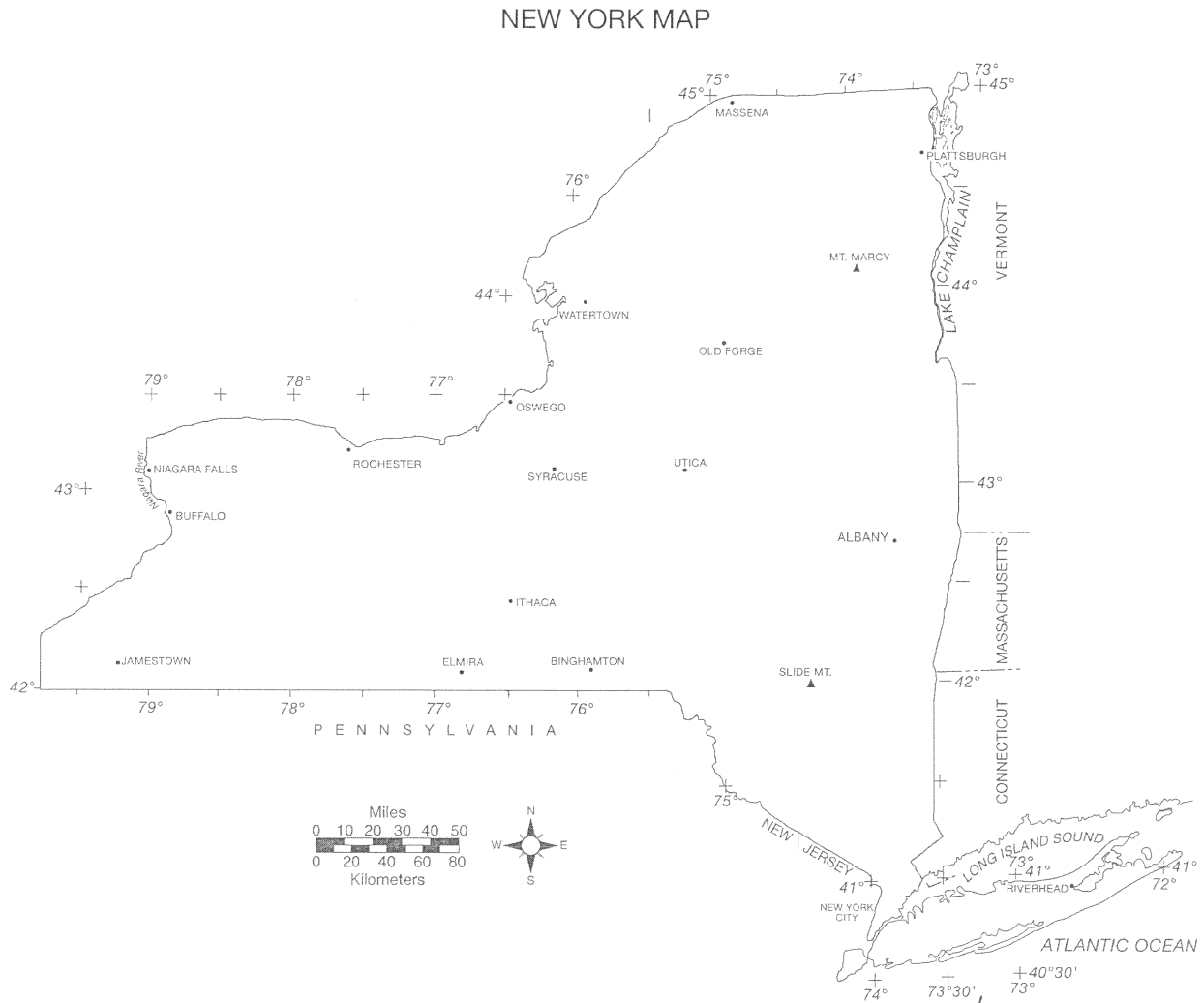
WORLD MAP



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## PROCEDURE D:

Use the New York Map to locate and record the approximate latitude and longitude coordinates of the listed cities:



*Must include degrees and minutes!*  
 DATA CHART 2

Location	Latitude	Longitude
Watertown		
Niagra Falls		
Old Forge		
Oswego		

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## DISCUSSION QUESTIONS:

1. What is the largest possible latitude that one can reach?
2. What is the latitude of the South Pole?
3. Explain why two circles of latitude never touch?
4. What is your exact location if you are crossing the Prime Meridian and the altitude of Polaris is  $50^\circ$ .
5. On the surface of the Earth, it is approximately 6,200 miles from the equator to the North Pole or South Pole. How many miles is it between two parallels  $1^\circ$  apart?
6. What is the maximum number of degrees of longitude possible?
7. Explain why the distance between two meridians at the North Pole is 0 miles?

**CONCLUSION:** Describe how latitude and longitude coordinates are used to locate positions on Earth?