

NAME: _____ PERIOD: _____ DATE: _____

LAB PARTNERS: _____ LAB #5

LOCATING POSITIONS ON THE EARTH USING LATITUDE AND LONGITUDE

Phenomena:

The GPS systems we have today rely on satellites and technology like phones to tell you where you are and where you are traveling. Now imagine there all GPS systems stopped working. How would you know where you are? Is there is another way to know your location without using technology?

How GPS Works Today: https://www.youtube.com/watch?v=wCcARVbL_Dk

INTRODUCTION

To determine locations on the Earth's surface, you must have points of reference. A coordinate system, which is a system of imaginary lines, has been developed. The latitude-longitude coordinate system is the most commonly used system to locate places on the Earth's surface. Latitude is the angular distance north or south of the equator. Longitude is the angular distance east or west of the prime meridian. In this lab you will be using different views of the Earth's latitude-longitude system to locate and describe locations on Earth's surface.

NGSS Standard(s):

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity



MATERIALS

Pencil with eraser
Globe
Computer

PROCEDURES:

1. Part 1: Answer the questions
2. Part 2: Identify the latitude and longitude of the given cities
3. Part 3: Plot letters A-J on the world map given the latitude and longitude
4. Part 4: Identify the latitude and longitude to the nearest minute for cities in New York State
5. Part 5: Using a Globe, identify the latitude and longitude for the given cities
6. Part 6: Answer the questions using the information from the lab and the provided video

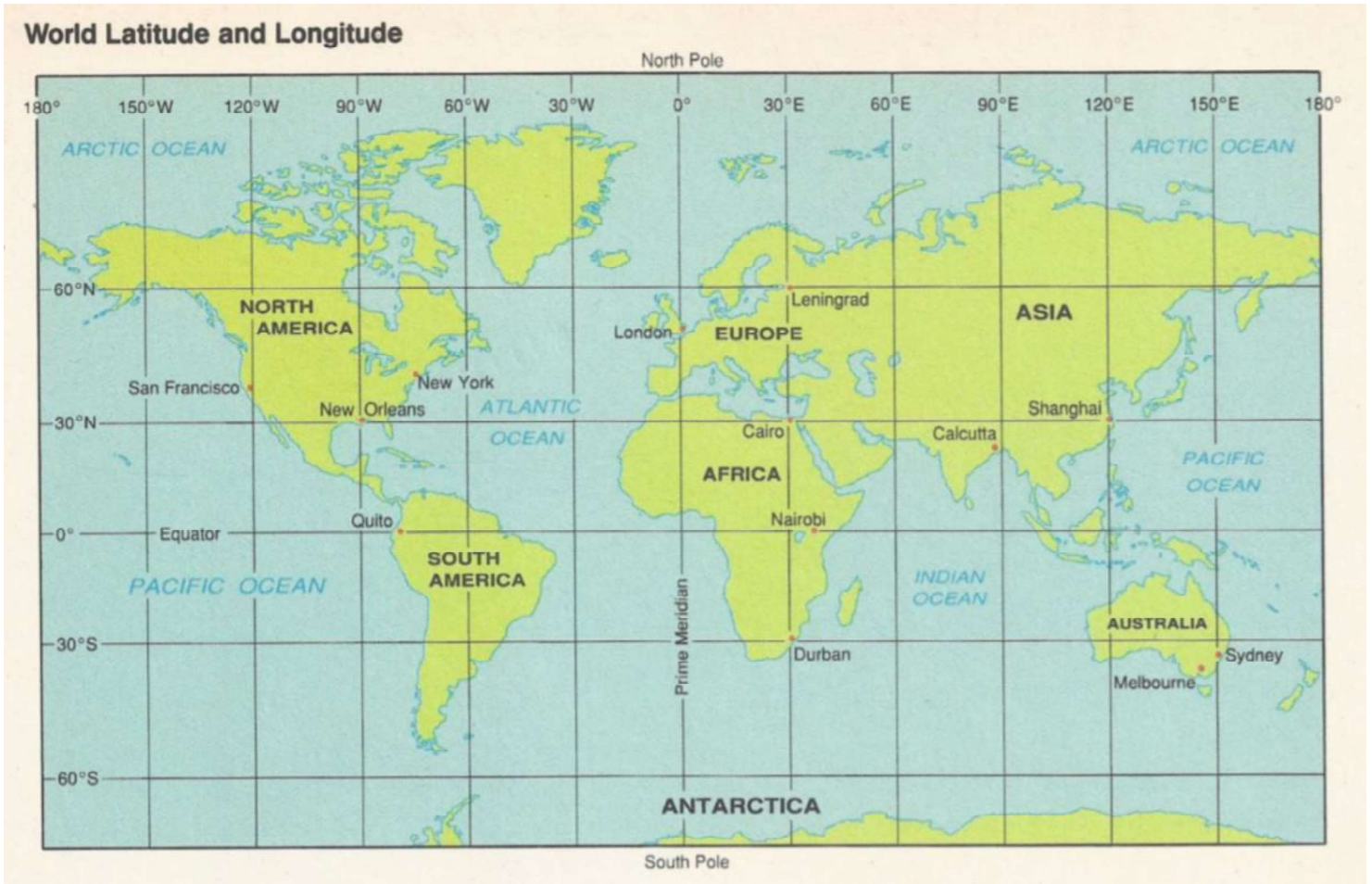
PART 1

Answer the following questions that will help you through this lab

1. From what reference line on the earth is latitude measured? _____
 - a. What is the latitude of this line? _____
2. From what reference line on the earth is longitude measured? _____
 - a. What is the longitude of this line? _____
 - b. Through what city does this line pass? _____

PART 2

Using the model of the World Map, identify the latitude and longitude with compass direction of the following cities.

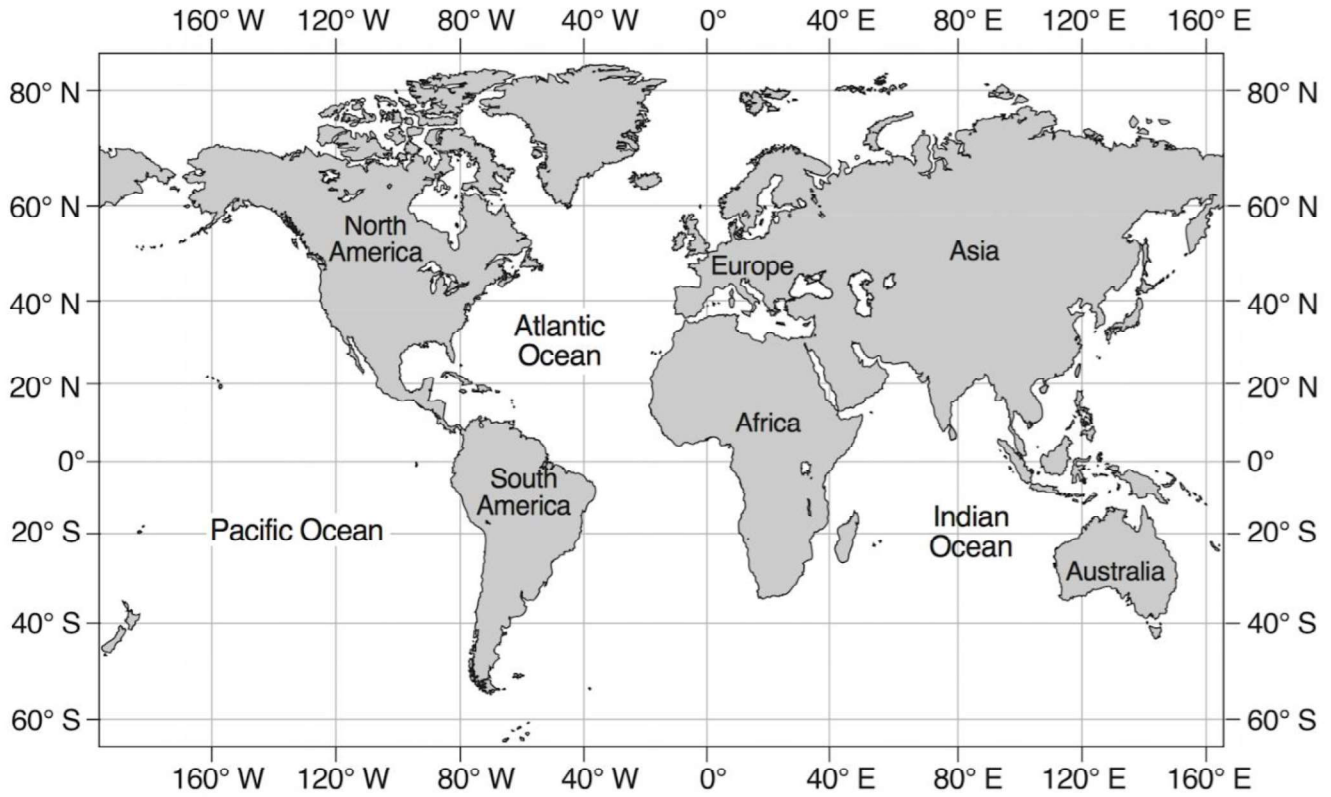


1. Durban: _____, _____
2. Melbourne: _____, _____
3. London: _____, _____
4. New York _____, _____
5. San Francisco: _____, _____
6. Shanghai: _____, _____
7. Quito: _____, _____
8. Nairobi: _____, _____
9. Leningrad: _____, _____
10. Calcutta: _____, _____

PART 3

Place the following point for each city on the Mercator Model of the World Map.

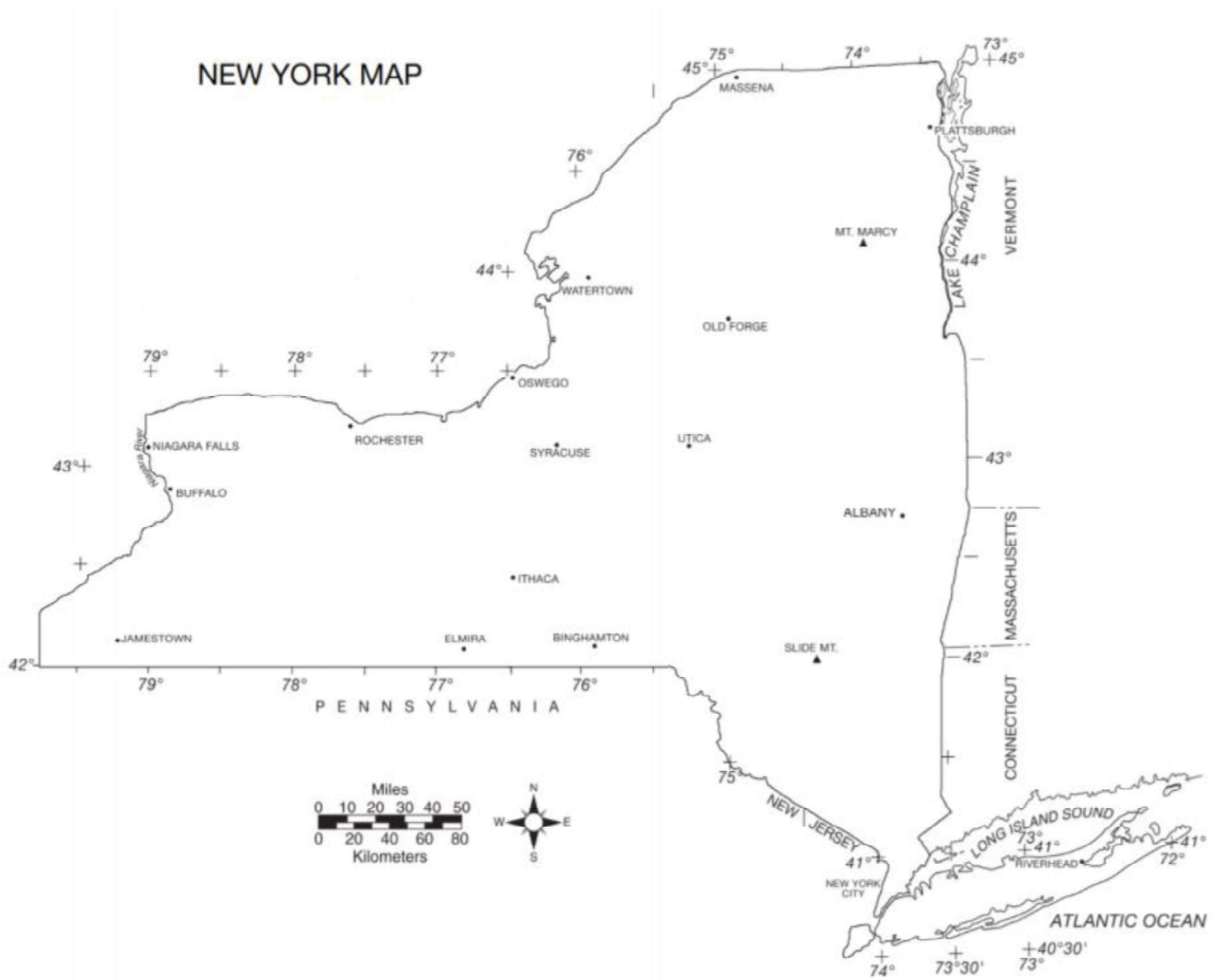
WORLD MAP



Point	City	Latitude	Longitude
A	Detroit, Michigan	42°N	83°W
B	Cape Town, South Africa	33°S	18°E
C	Chihuahua, Mexico	28°N	106°W
D	Stockholm, Sweden	59°N	18°E
E	Moscow, Russia	55°N	37°E
F	Rockhampton, Australia	23°S	150°E
G	Anchorage, Alaska	61°N	149°W
H	Buenos Aires, Argentina	34°S	58°W
I	San Juan, Puerto Rico	18°N	66°W
J	Francistown	21°S	27°E

Part 4

Use the model of New York State to identify the latitude and longitude to the nearest minute with compass direction for each city.



1. Ithaca: _____, _____
2. Niagara Falls: _____, _____
3. Albany: _____, _____
4. Riverhead: _____, _____
5. Old Forge: _____, _____
6. Syracuse: _____, _____
7. Massena: _____, _____
8. Oswego: _____, _____
9. Utica: _____, _____
10. Plattsburg: _____, _____

PART 5

Use a globe to find the latitude and longitude of the latitude and longitude of the following cities:

City	Latitude	Longitude
San Francisco, California		
Paris, France		
Tokyo, Japan		
Sydney, Australia		
Mexico City, Mexico		

Part 6

Answer the following conclusion questions based on this lab:

1. Using google Earth, look up any city you want. Looking in the bottom right corner, write down the latitude and longitude with compass direction of this city:

City: _____ ; Latitude: _____, Longitude: _____

a. How does google Earth modify the use of the latitude/longitude coordinate system?

2. How has human activity changed the use of latitude and longitude?

3. Why is latitude and longitude important for humans to know if GPS systems exist?

4. Watch this video then answer the following questions: <https://www.youtube.com/watch?v=20SlkraEGHs>

a. Why is having a GPS system important?

b. What is the relationship between latitude/longitude and the GPS system we have today?