Name: _____

Date: _____ Period: _____

Lab Activity: Crustal Boundaries

INTRODUCTION:

According to the plate tectonic theory, Earth's surface is divided into moving plates. A large, mobile slab of rock that is part of Earth's rigid outer shell known as the lithosphere. This includes rocks of the upper crust and upper mantle.

The boundaries between plates are of three general types. The boundaries between plates that are moving apart is termed diverging, while a boundary between plates that are moving toward each other is called converging. A transform boundary is found where two plates are moving horizontally past one another.

OBJECTIVE:

You will distinguish between diverging, converging, and transform tectonic plate boundaries. You will also use ocean floor depth data to construct a ocean bottom profile and identify the key features of a specific type of plate boundary.

VOCABULARY:

Diverging Plate Boundary -

Sea-floor Spreading -

Mid-ocean Ridge -

Rift Valley -

Converging Plate Boundary -

Subduction -

Transform Plate Boundary -

Lab Activity: Crustal Boundaries

PROCEDURE A:

1. Using a blue colored pencil, draw a horizontal line across the “North Atlantic Ocean Bottom Profile” at a depth of 0 km. This represents the ocean surface (sea level).
2. Construct and ocean bottom profile on the graph titled “North Atlantic Ocean Bottom Profile” using the ocean depth data provided.
3. Color the area below the constructed ocean bottom profile brown. This represent the lithosphere (Earth’s crust) under the ocean.
4. Color the area between the blue ocean surface line and the lithosphere blue.
5. Label the following ocean floor features:
    - Mid-Atlantic Ridge
    - Rift Valley
    - Continental Shelf
    - Deep Ocean Floor
6. Based on your knowledge of Earth Science, draw arrows at the bottom of the “North Atlantic Ocean Bottom Profile” to indicate the direction of plate movement.

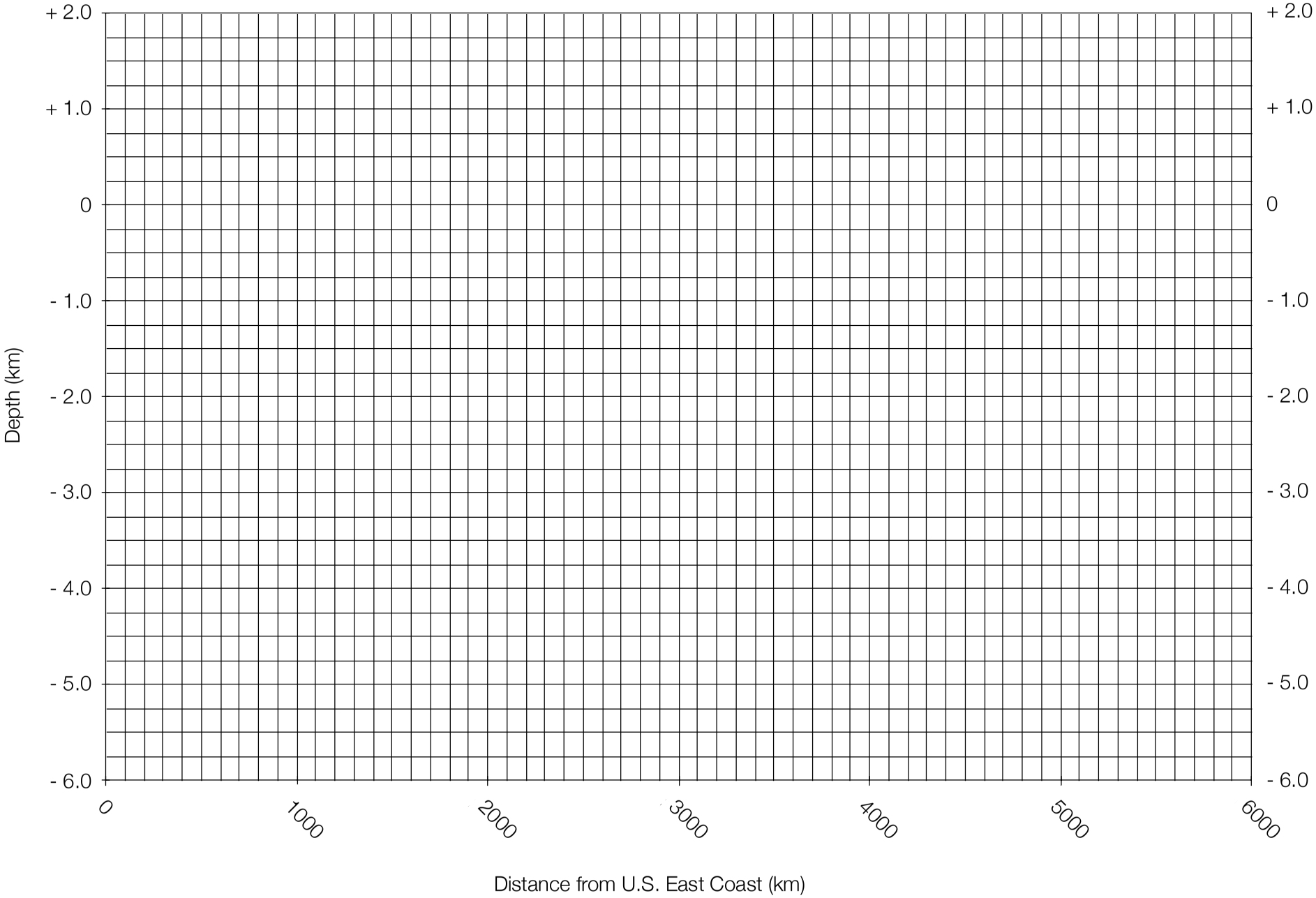
OCEAN DEPTH DATA

Distance (km)	Depth (km)
0	0
100	-0.25
200	-2.75
400	-3.75
500	-3.75
600	-4.5
2000	-4.5
2500	-4.0

Distance (km)	Depth (km)
2900	-2.75
3000	-1.75
3050	-3.0
3100	-2.5
3200	-3.0
3500	-3.5
3600	-3.75
3650	-3.75

Distance (km)	Depth (km)
4000	-4.0
4500	-4.5
5000	-5.0
5300	-4.5
5800	-3.75
5900	-0.25
6000	0
-	-

North Atlantic Ocean Bottom Profile



Lab Activity: Crustal Boundaries

PROCEDURE B:

1. Plot the “Earthquake Depth Data” below onto the “Peru-Chile Trench” graph on the next page.
2. Draw a best-fit line for the plotted points showing the trend in data.
3. Assuming the best-fit line is the upper surface of a subducting plate, label the following:
    - South America Plate
    - Nazca Plate
    - Continental Crust Density
    - Oceanic Crust Density
    - Arrows showing subduction

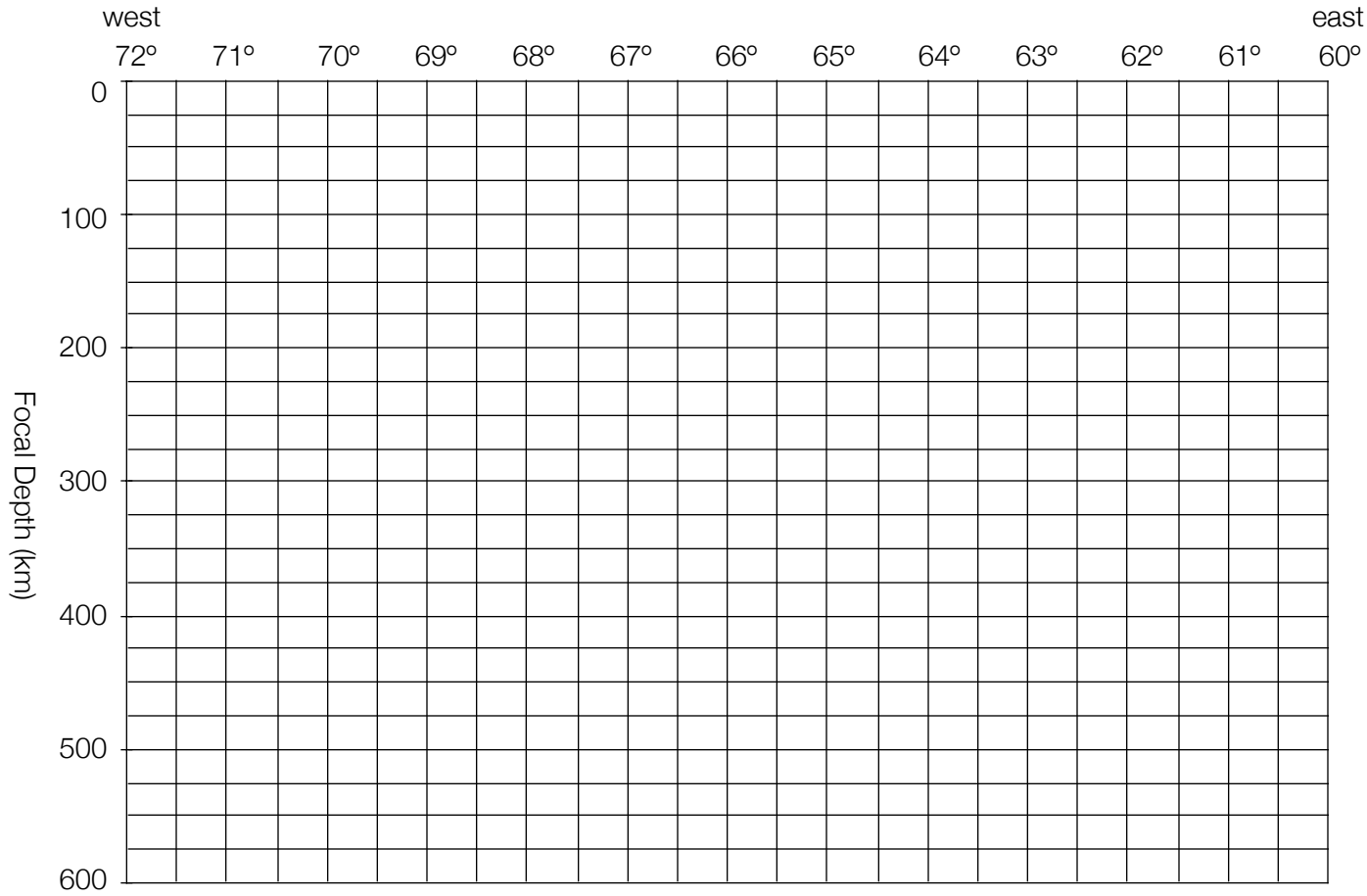
EARTHQUAKE DEPTH DATA

Longitude (ºW)	Focus Depth (km)
67.0	175
63.5	325
69.5	75
62.5	475
70.5	25
61.5	525
68.5	125
70.0	25
69.0	100
65.5	300
64.0	350
70.5	75

Longitude (ºW)	Focus Depth (km)
66.5	225
68.5	150
67.5	200
67.5	125
69.5	100
68.0	100
68.0	150
67.5	175
68.5	75
70.0	100
65.0	275
70.0	50

Lab Activity: Crustal Boundaries

PERU-CHILE TRENCH



Lab Activity: Crustal Boundaries

DISCUSSION QUESTIONS:

1. At what type of plate boundary is new oceanic crust formed?

2. What prominent sea-floor feature is located in the central Atlantic Ocean?

3. As distance form the mid-ocean ridge increases what happens to the age of the sea-floor?

4. Describe the pattern of earthquake depth along the Peru Chile Trench?

5. Name two geologic features that can be found at a subduction zone.

CONCLUSION: List and describe the three types of plate boundaries.