

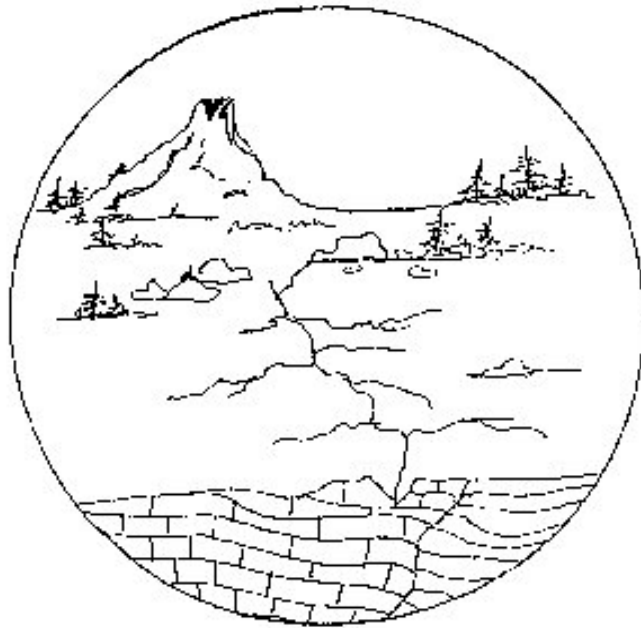


Plate Tectonic Cycle

Earth's Moving Force



SIXTH GRADE WORKBOOK



student _____

PLATE TECTONIC CYCLE - VOLCANOES (6)

LAB

PROBLEM: Do the different types of volcanoes occur in certain areas around the world?

PREDICTION: _____

PROCEDURE:

Locate the following volcanoes on the map or globe provided. Use three colors of stick-on dots, use one color for composite, one for shield, and one for cinder cone. Put the number of the volcano you are plotting on the dot, and then locate the dot on the map or globe and decide if you can see a pattern. The class will then discuss this to see if there is a world wide pattern.

COMPOSITE COLOR OF DOT

1. Mt. St. Helens, Washington
2. Mt. Lassen, California
3. Mt. Shasta, California
4. Mt. Etna, Italy
5. Mt. Vesuvius, Italy
6. Camignin, Philippines
7. Mt. Fuji, Japan
8. Lado, Philippines
9. Mt. St. Augustine, Alaska
10. Mt. Rainier, Washington
11. Mt. Adams, Washington
12. Glacier Peak, Washington

SHIELD COLOR OF DOT

13. Kilauea, Hawaii
14. Helka, Iceland
15. Mauna Loa, Hawaii
16. Surtsey, Iceland
17. Mauna Kea, Hawaii
18. Level Mt., Alaska
19. Newberry, Oregon
20. Azul, Chile
21. Hualalai, Hawaii
22. Nunak Island, Alaska

CINDER CONE COLOR OF DOT

23. Parcutin, Mexico
24. Cerro Negro, Nicaragua
25. Brown Mt., Oregon
26. St. Paul Is., Alaska
27. Sand Mt. Field, Oregon
28. Sunset Crater, Arizona
29. Jordon Craters, Oregon

Type of map projection used. _____

CONCLUSION:

Do you see a pattern? _____ Explain in detail. _____

After the class discussion, did you see a pattern? _____

PLATE TECTONIC CYCLE - VOLCANOES (6)

POST LAB

DIRECTIONS: Find the active volcanoes in the area assigned by your teacher. Record the following information about each volcano. Plot the location of each volcano the map.

1. NAME OF VOLCANO: _____
WHERE LOCATED: _____
TYPE OF PLATE BOUNDARY _____
WHEN IT ERUPTED _____
COMPOSITION OF LAVA ERUPTED _____
WHAT HAPPENED: How long did the eruption last, what was erupted, what kind of property damage (if any) occurred _____

2. NAME OF VOLCANO: _____
WHERE LOCATED: _____
TYPE OF PLATE BOUNDARY _____
WHEN IT ERUPTED _____
COMPOSITION OF LAVA ERUPTED _____
WHAT HAPPENED: _____

3. NAME OF VOLCANO: _____
WHERE LOCATED: _____
TYPE OF PLATE BOUNDARY _____
WHEN IT ERUPTED _____
COMPOSITION OF LAVA ERUPTED _____
WHAT HAPPENED: _____

4.. NAME OF VOLCANO: _____
WHERE LOCATED: _____
TYPE OF PLATE BOUNDARY _____
WHEN IT ERUPTED _____
COMPOSITION OF LAVA ERUPTED _____
WHAT HAPPENED: _____

PLATE TECTONIC CYCLE - VOLCANOES (6) - POST LAB

PLOT YOUR VOLCANOES ON THE WORLD MAP

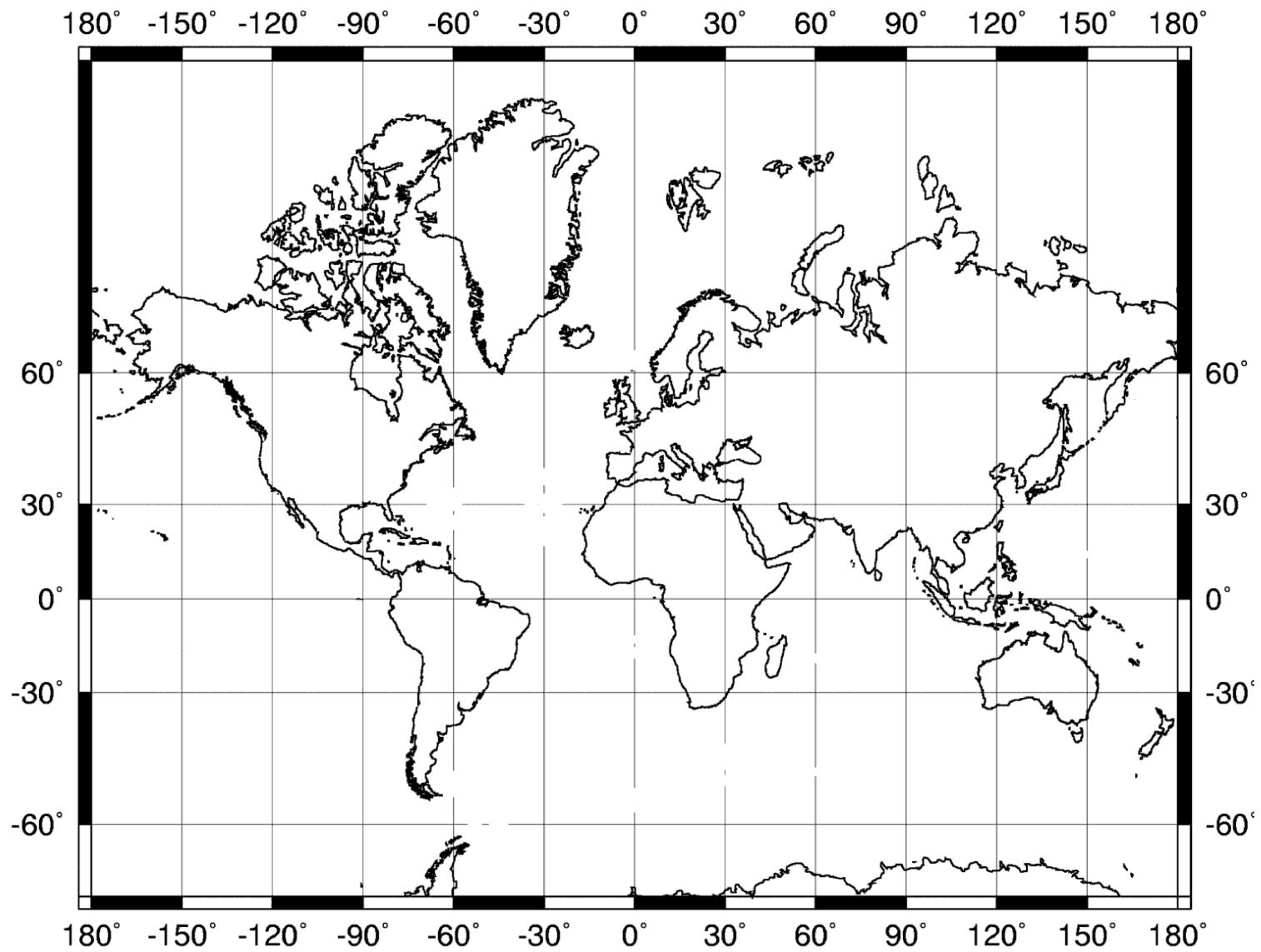


PLATE TECTONIC CYCLE - EARTHQUAKES (6)

LAB

PROBLEM: Do waves pass through different substances differently?

PREDICTION: _____

PROCEDURE: Earthquakes produce seismic waves. This lab will explore how waves behave as they travel through different substances.

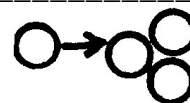
EXERCISE I. MATERIALS: 4 pennies, 4 nickels, graph paper

1. Place 1 penny about 8 inches away from another penny on top of the graph paper. Snap one penny into the other. Record the motion of the penny and how far the penny moved.

2. Repeat the exercise, replacing one penny with a nickel. Use the same amount of "snap" as in the picture to the right. Record what happens.



3. Place the pennies as in the picture to the right. Snap one penny. Record what happens.



4. Repeat the exercise using nickels. Record what happens.

5. Repeat #4, except use one penny behind the shooting line. Is there a difference? _____ If so, why? _____

EXERCISE II.

MATERIALS: density timer

Tap one side of the density timer. Do the waves travel differently through the oil and water? Record what happens. _____

EXERCISE III.

MATERIALS: 1 balloon filled with water, one balloon filled with air.

Tap the side of each balloon. Is there a difference between the two? Why? _____

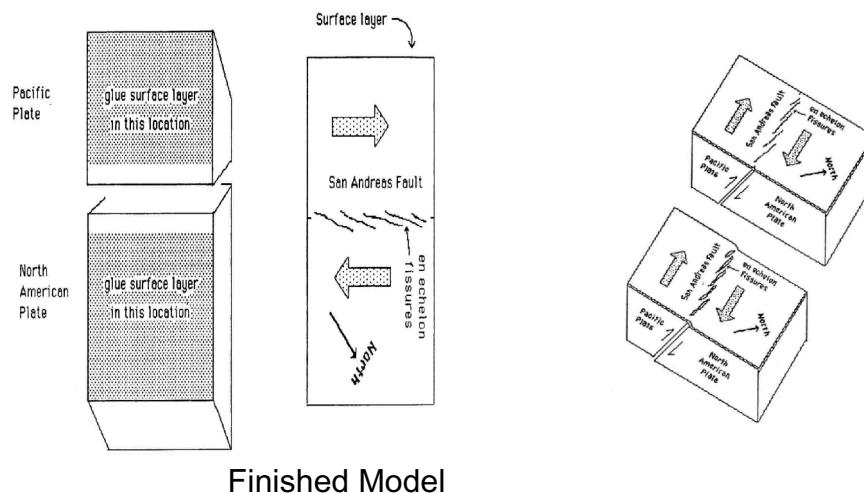
CONCLUSION: If waves go through different substances at different speeds, how can we use this information to determine what is inside the earth?

PLATE TECTONIC CYCLE - EARTHQUAKES (6) - POST LAB

MAKING A PAPER MODEL OF THE 1989 LOMA PRIETA EARTHQUAKE

INSTRUCTIONS:

1. Cut out all three pieces of the model (next page).
2. Fold the two large pieces into box shapes, as illustrated. Make sure you fold all the areas before you start gluing.
3. Glue the tabs of the two boxes and assemble them.
4. Glue the surface layer to the tops of the two boxes. Be careful that the area of the fissures remains glue free.
5. To simulate the earthquake displacement, shift the "Pacific plate" box upward and to the north. Notice how the fissure buckles.



Model (Instructions on next page)



PLATE TECTONIC CYCLE - EARTHQUAKES (6) - POST LAB

Cut the model as shown below.

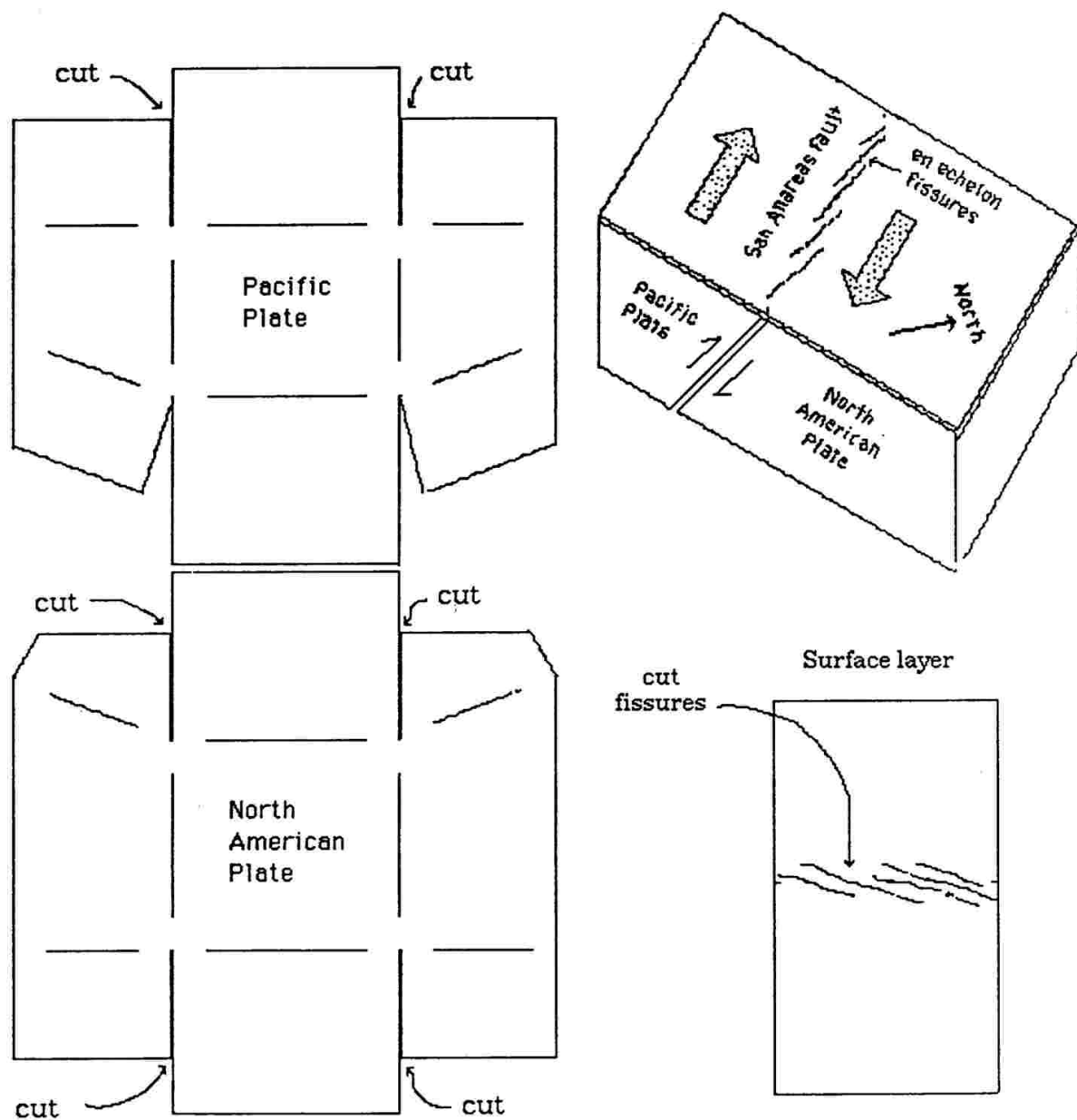
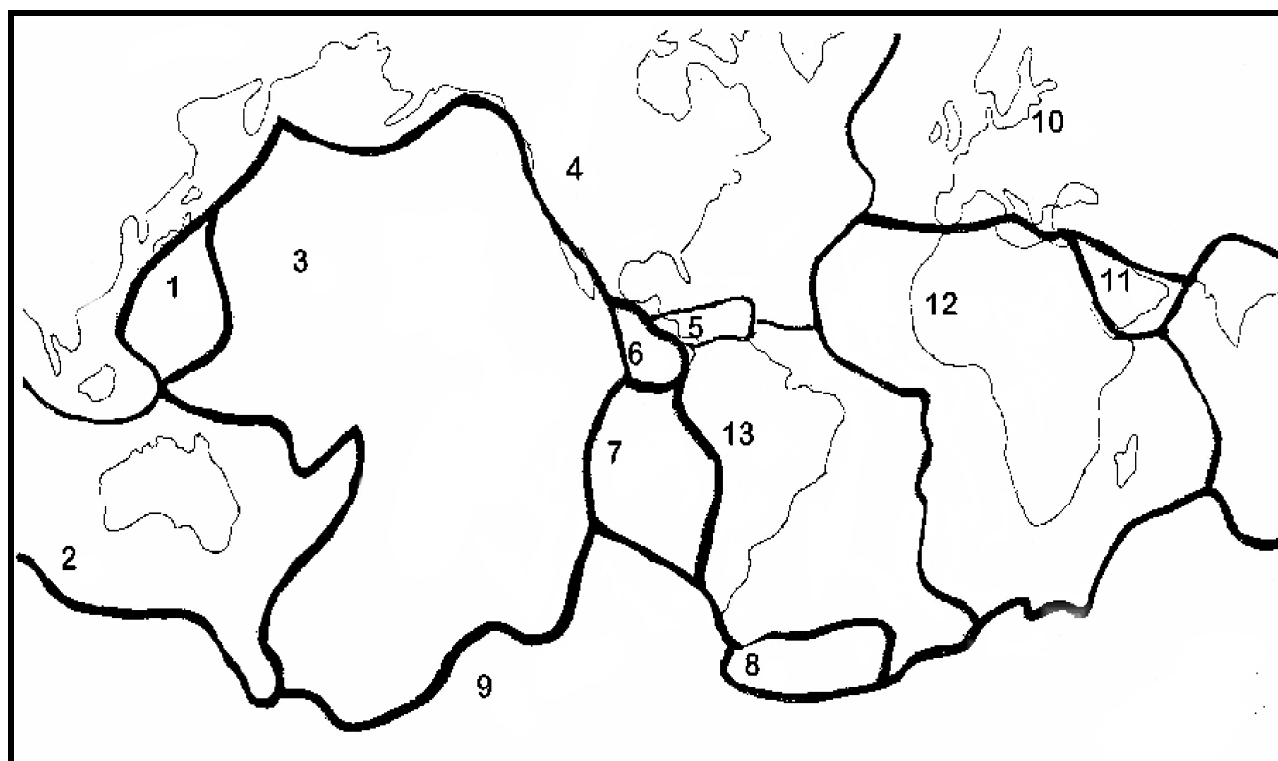


PLATE TECTONIC CYCLE - PLATE TECTONICS (6)

PRE LAB

Name the plates. Use your imagination! Look at a globe and relief map of the world and find features that might be associated with these boundaries. Label them on the map. Your teacher will go over the “real” names of the plates.



1	8
2	9
3	10
4	11
5	12
6	13
7	

PLATE TECTONIC CYCLE - PLATE TECTONICS (6) LAB

PROBLEM: What do earthquakes and volcanoes have to do with plate tectonics?

PREDICTION:

MATERIALS: Wall map of earthquakes and/or volcanoes of the world; NOAA/NESDIS icosahedron globe, crayons

PROCEDURE:

Using the information about what defines a "plate", color the continents so they can be easily seen. Use a pencil to draw on the map, where you think the plates are. Look at the larger maps for more detailed information to help you decide. Cut, fold, and paste the globe together.

ANSWER THE FOLLOWING QUESTIONS:

1. How many plates have you defined?

2. Are there any "problem" areas?_____ List them:

3. Where are there earthquakes and no plate edges?

4. Where do two plates meet in the United States?_____

CONCLUSION:

How many plates did you find? What was your criteria for defining these plates?

PLATE TECTONIC CYCLE - PLATE TECTONICS (6) LAB

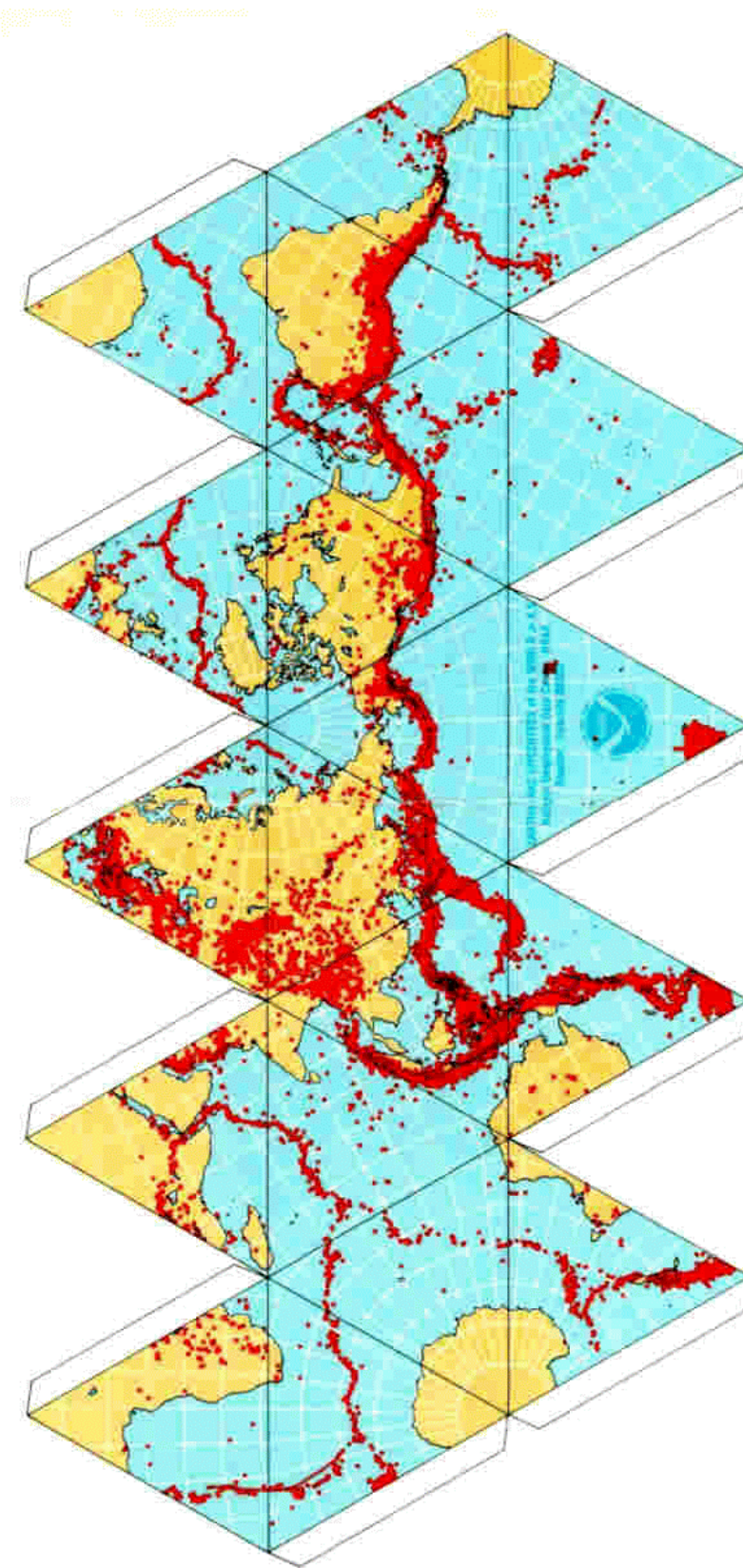


PLATE TECTONIC CYCLE - PLATE TECTONICS (6)
LAB

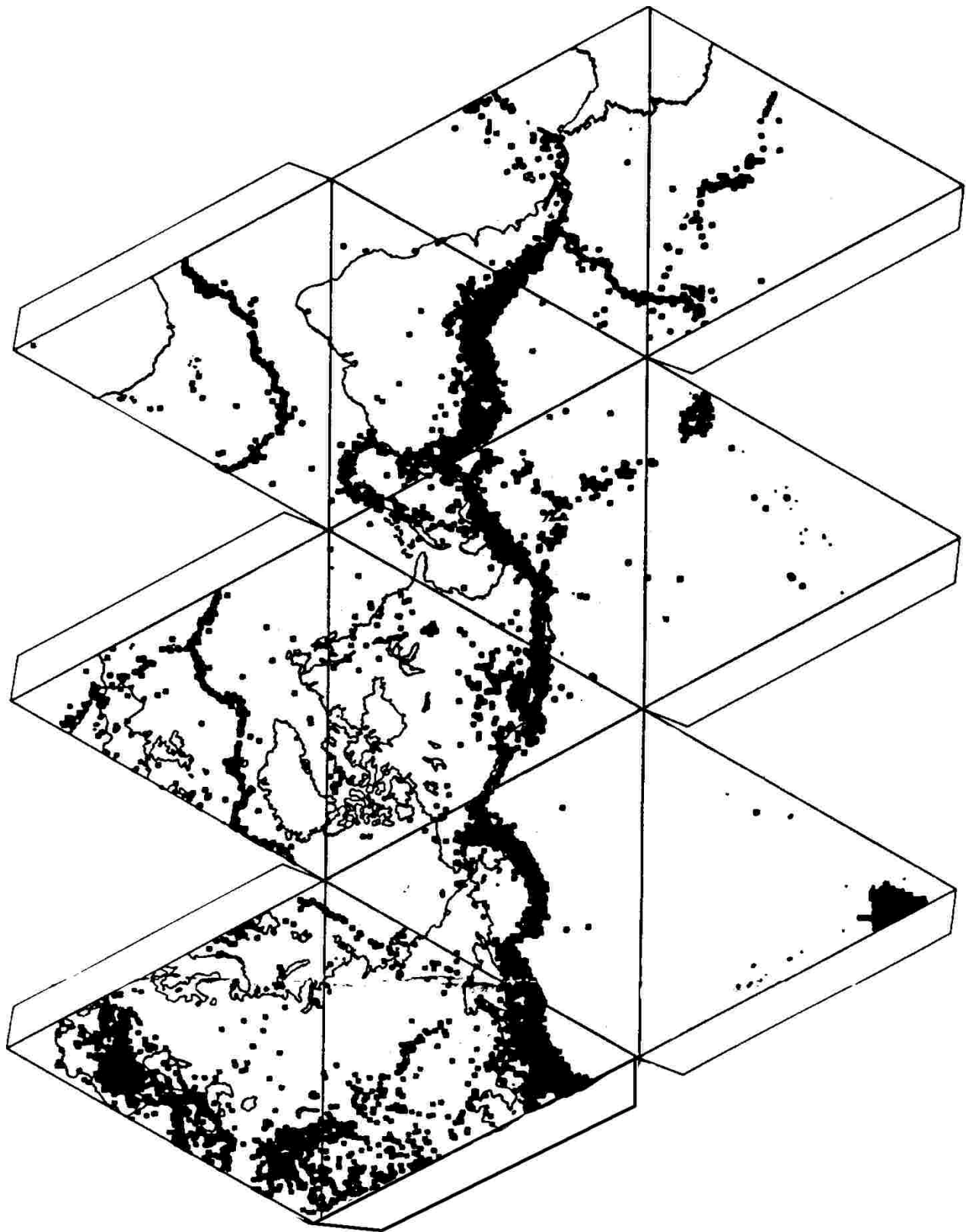


PLATE TECTONIC CYCLE - PLATE TECTONICS (6)
LAB

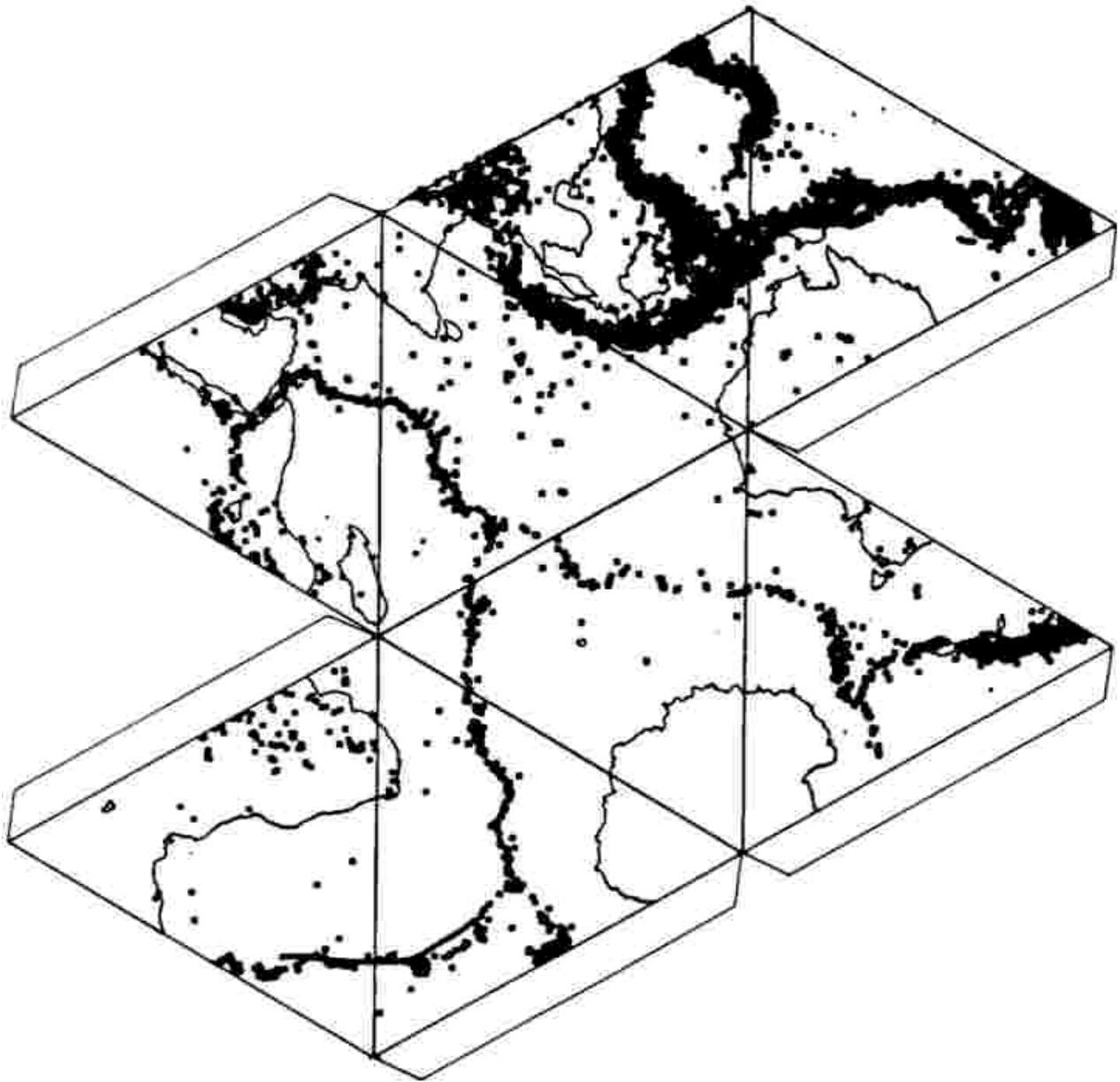


PLATE TECTONIC CYCLE - PLATE TECTONICS (6)

POST LAB

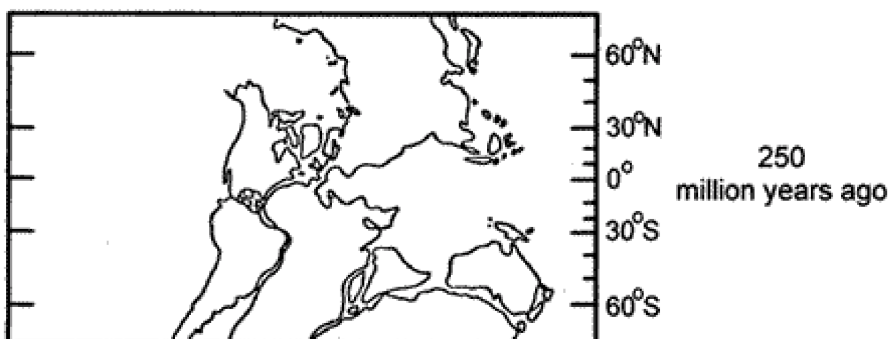
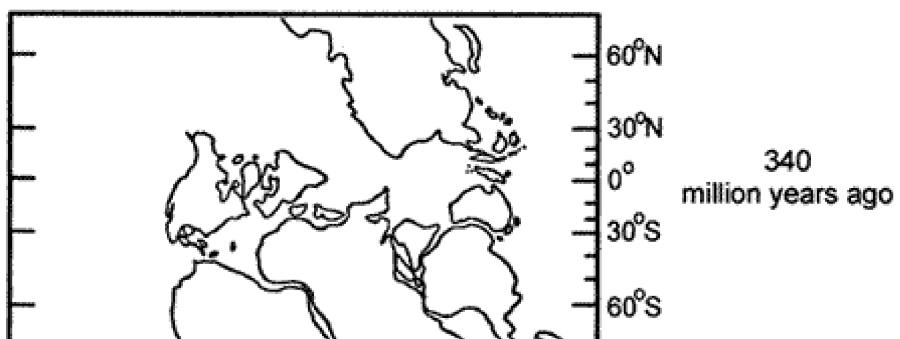
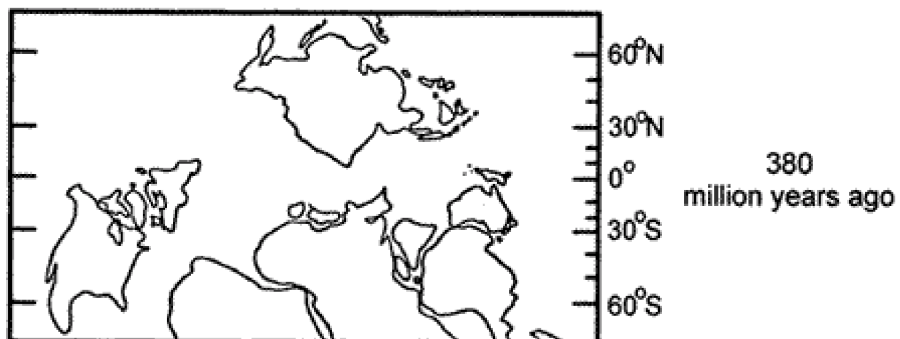
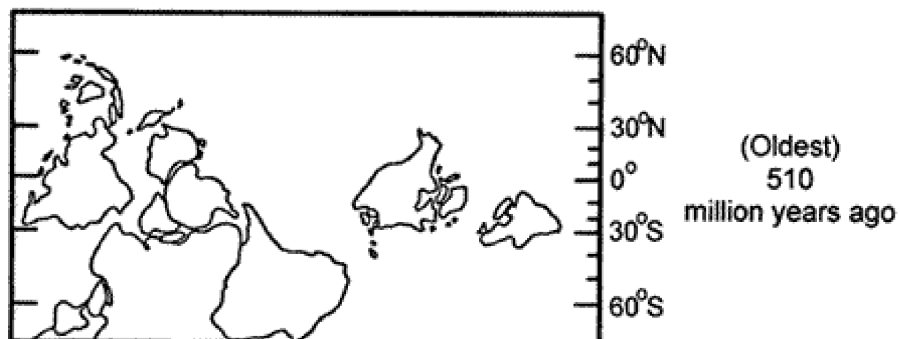


PLATE TECTONIC CYCLE - PLATE TECTONICS (6)
POST LAB

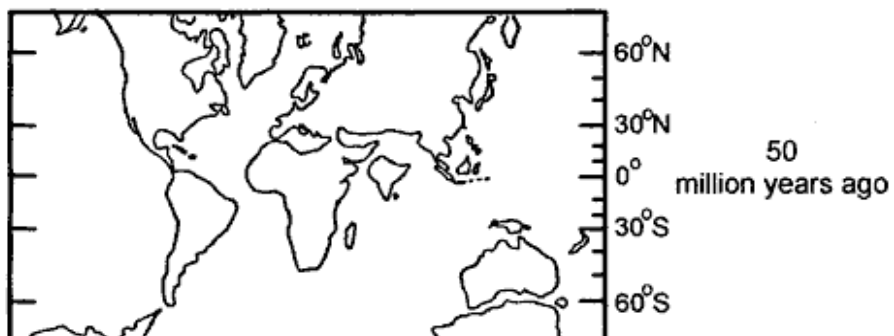
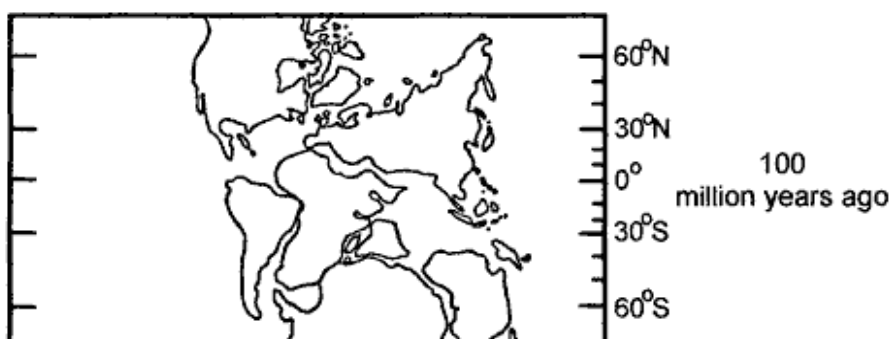
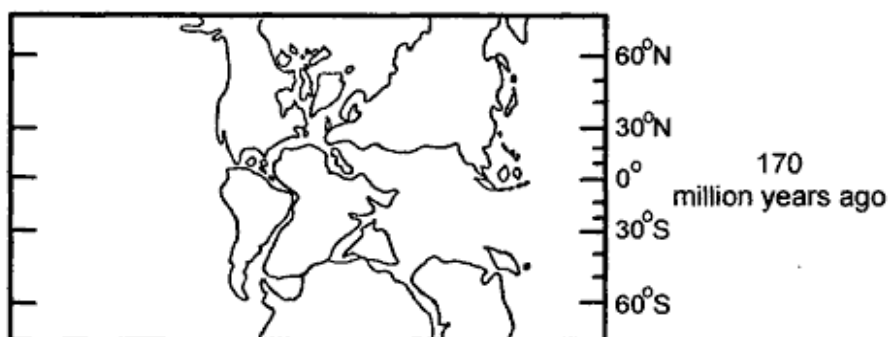
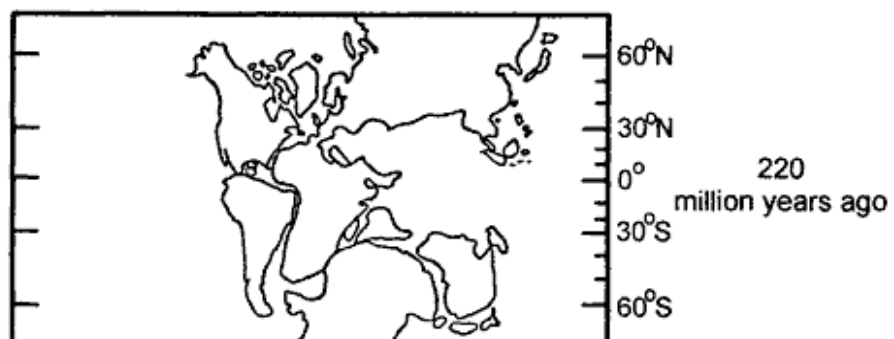


PLATE TECTONIC CYCLE - HAZARDS (6)

PRE LAB

Examine the maps of Alaska and Hawaii. These maps show Modified Mercalli Scale intensities of earthquakes that occurred between the years of 1971-1980. The higher the intensity of the earthquake, the stronger it was.

1. Which state had the most earthquakes? _____

2. Which had the strongest earthquakes?

3. Color in red the areas you think would be the most hazardous to live in. Why are these areas dangerous?

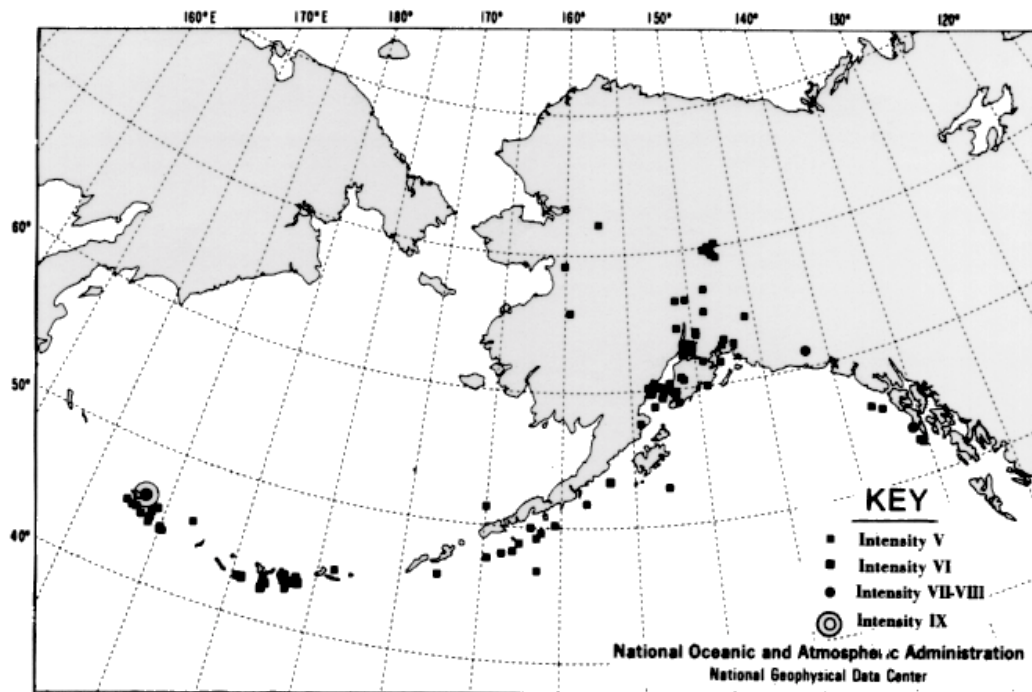
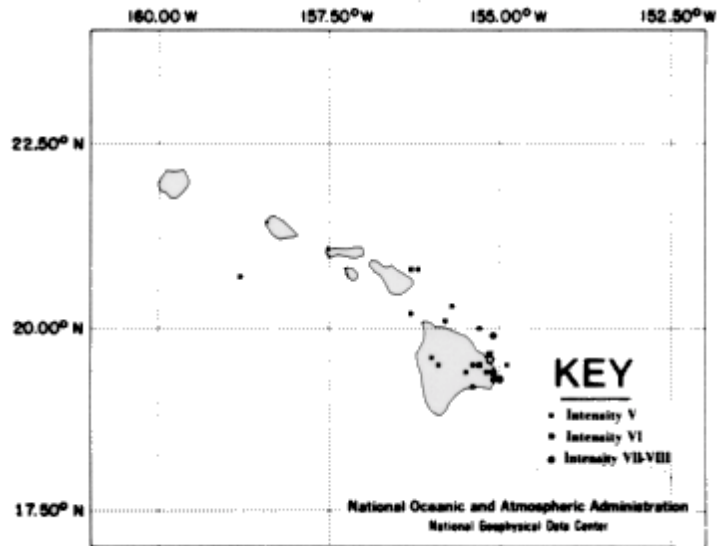


PLATE TECTONIC CYCLE - HAZARDS (6)

LAB

PROBLEM: What types of damage can be caused by an earthquake?

PREDICTION: _____

PROCEDURE:

Use the following intensities on the Shaker Boards:

- A. slow-long board (low intensity)
- B. quick-long board (high intensity)
- C. slow-side board (low intensity)
- D. quick-side board (high intensity)

Build a structure that you feel can withstand an earthquake. Test the different intensities described above. Test A, B, C, and then D. If the structure falls down during one intensity rebuild it the same way and test the other intensities. Redesign structure and retest only those intensities in which the original design failed.

Type of building material: _____

INTENSITY	DRAW STRUCTURE AND STATE THE DAMAGE THAT OCCURRED
A	
RECORD ANY CHANGES MADE:	
B	
RECORD ANY CHANGES MADE:	
C	
RECORD ANY CHANGES MADE:	
D	
RECORD ANY CHANGES MADE:	

CONCLUSION: Can structures be designed to withstand different earthquake intensities?

How? _____

PLATE TECTONIC CYCLE - HAZARDS (6)

Write an essay with the following lead sentence.

"It was a hot, blistering day when the big earthquake occurred. I was home..."

[illegible]