

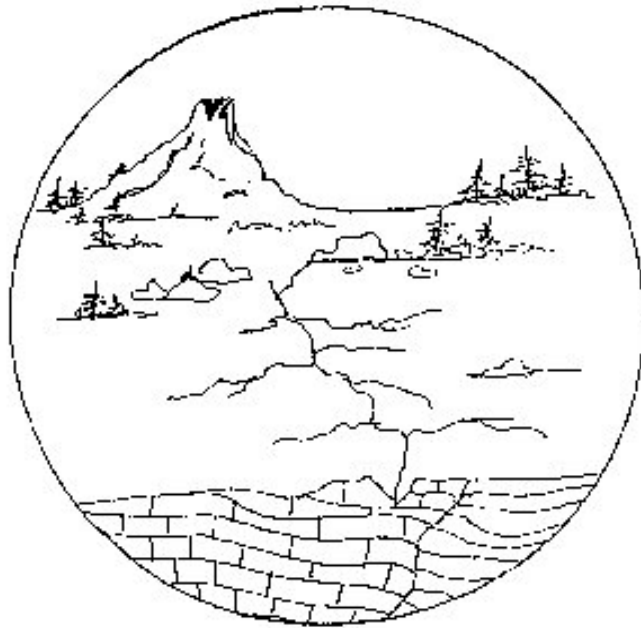


Plate Tectonic Cycle

Earth's Moving Force



FIFTH GRADE WORKBOOK



student _____

PLATE TECTONIC CYCLE - VOLCANOES (5)

LAB

PROBLEM: Do rocks produced by volcanoes provide clues about that volcanic eruption?

PREDICTION: _____

Look at a map and locate where the rocks came from in California. Describe the rocks in the area provided below. After learning about the type of eruption that caused the volcano, can you interpret if there is a difference in rock type between a violent eruption and a quiet eruption?

1. **GILROY, CALIFORNIA** - This ancient lava flow erupted with a powerful blast. Lava cascaded down the slopes of the growing volcano.

DESCRIPTION: _____

2. **CLEARLAKE, CALIFORNIA** - The cinders swished from the volcano, causing extensive deposits, (scoria). Flows of lava cooled quickly to form thick bands of obsidian.

DESCRIPTION: (scoria) _____

DESCRIPTION: (obsidian) _____

3. **BLACK BUTTES, CALIFORNIA** - Lava slowly moved from the crater of the volcano. A thick layer of basalt was deposited.

DESCRIPTION: _____

4. **MONO CRATERS, CALIFORNIA** - The volcano "coughed" violently, gas trapped in the molten rock formed pumice.

DESCRIPTION: _____

5. **MT. LASSEN, CALIFORNIA** - The magma chamber was cooling, but suddenly the volcano erupted.

DESCRIPTION: _____

CONCLUSION: Are there characteristics of volcanic rocks that indicate what type of eruption produces them?

Is there enough data here to really tell? Explain. _____

PLATE TECTONIC CYCLE - EARTHQUAKES (5) LAB

PROBLEM: How can a seismogram tell you the intensity of an earthquake?

PREDICTION: _____

EXERCISE I. Examine the seismograms on the next pages. Label them with a “P” and an “S” where you think the first P (primary wave) and S (secondary wave) waves occur.

EXERCISE II. Each seismogram records a different earthquake. Using a U.S. placemat find the appropriate areas of each earthquake. Examine where each seismogram was recorded. Assuming that this was near the epicenter of the earthquake, describe the seismogram: does it record a small, moderate, or large earthquake? Does the shaking happen all at once, or is it spread out? In addition, describe the kinds of damage that may have happened at the epicenter.

	DESCRIPTION OF DAMAGE
seismogram 1. location: intensity:	
seismogram 2. location: intensity:	
seismogram 3. location: intensity:	
seismogram 4. location: intensity:	

CONCLUSION: Can scientists predict the types of damage that may happen during an earthquake? How? _____

PLATE TECTONIC CYCLE - EARTHQUAKES (5)

LAB

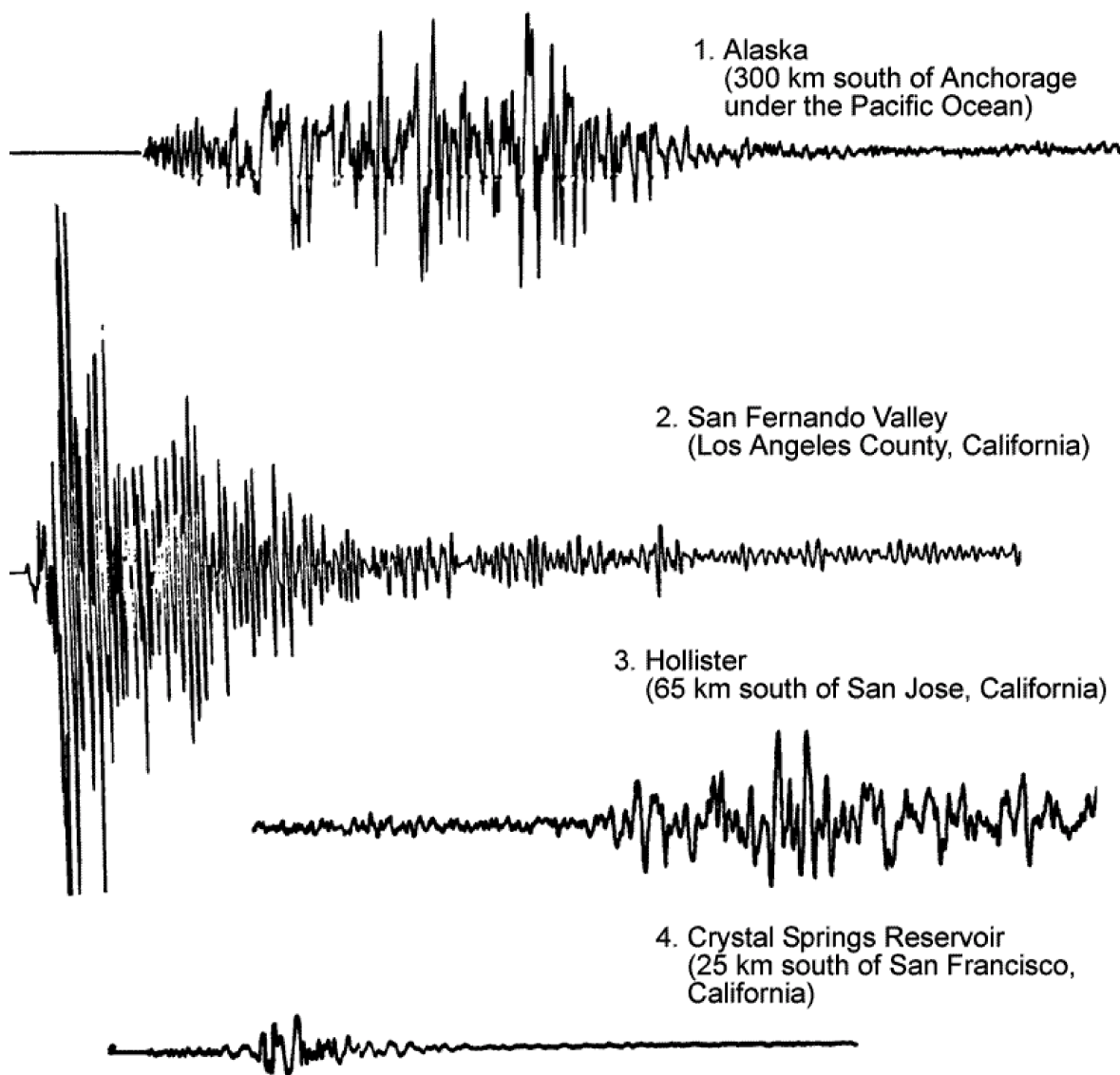
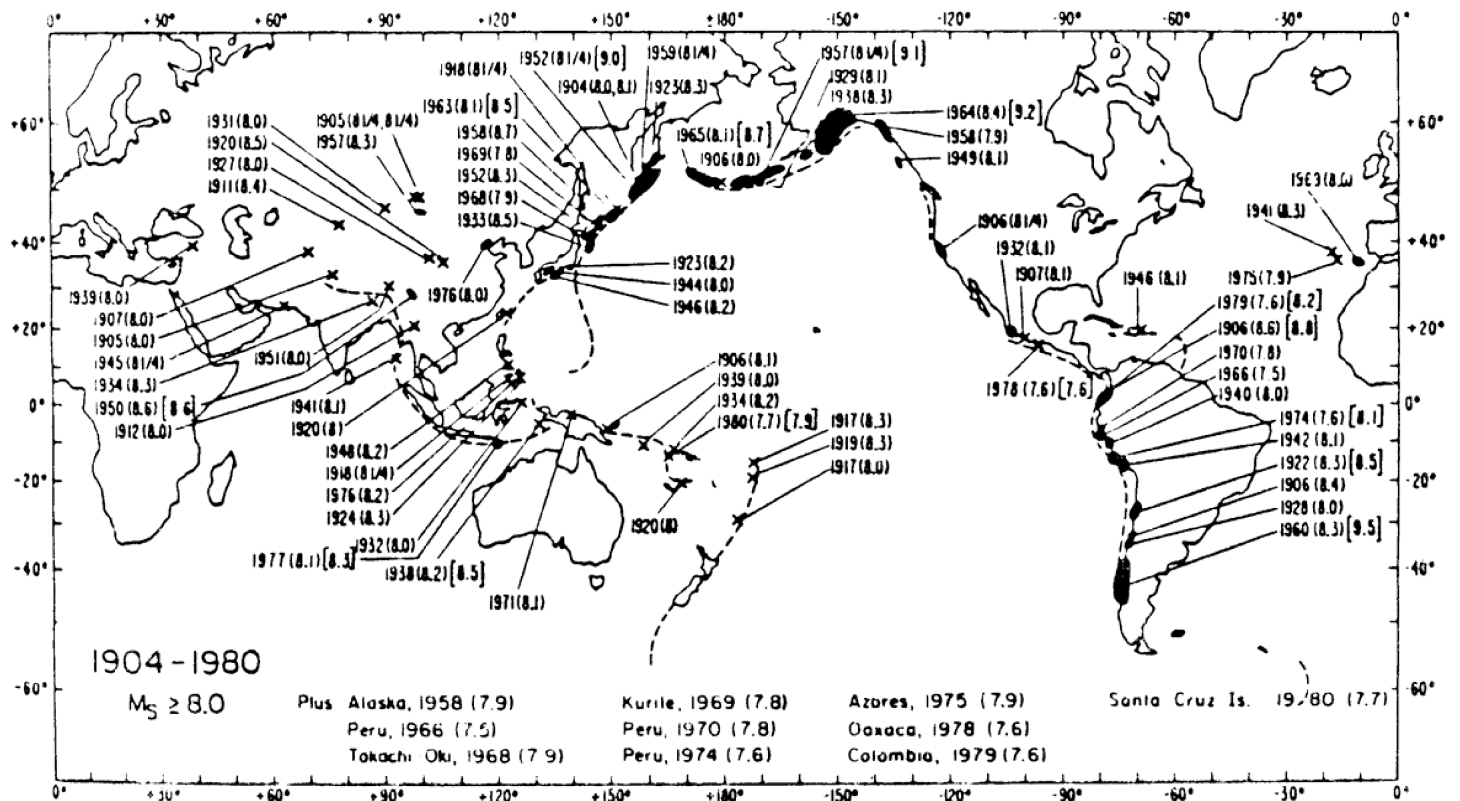


PLATE TECTONIC CYCLE - EARTHQUAKES (5)

POST LAB



1. Past earthquakes give us clues to where future earthquakes will happen. Using the map, list the areas where earthquakes are most likely to occur.

2. List the areas where large earthquakes are not likely to occur.

PLATE TECTONIC CYCLE - PLATE TECTONICS (5) LAB

PROBLEM: What theories can explain volcano and earthquake distributions on the Earth?

PREDICTION: _____

THEORY 1. EXPANDING EARTH

Make a paste mixture using approximately 1/4 cup water and 2 heaping teaspoons of flour. Blow up a balloon halfway. As one partner holds the balloon, the other partner will put a thin coating of mixture on about 1/4 of the balloon. This creates a model of the Earth's crust. As one partner slowly blows up the balloon; record what happens.








THEORY 2. CONTRACTING EARTH

Clean the balloon, and blow it up completely. Coat the balloon with the paste mixture to again model the crust. Deflate the balloon slowly, and record what happens.

THEORY 3. PLATE TECTONICS

Describe what happens when you apply equal or unequal pressures to the various objects, using your hands as charted below. Your teacher will clarify the diagrams.

Al=aluminum; w = wax paper;  = hand movement

	1  Al	2  Al  Al	3  Al W  Al	4 Al  W Al  Al
EQUAL PRESSURE				
UNEQUAL PRESSURE				

CONCLUSION: Which theory best explains the features of the Earth? Why?

PLATE TECTONIC CYCLE - PLATE TECTONICS (5)
POST LAB

TETRAHEDRON MAP

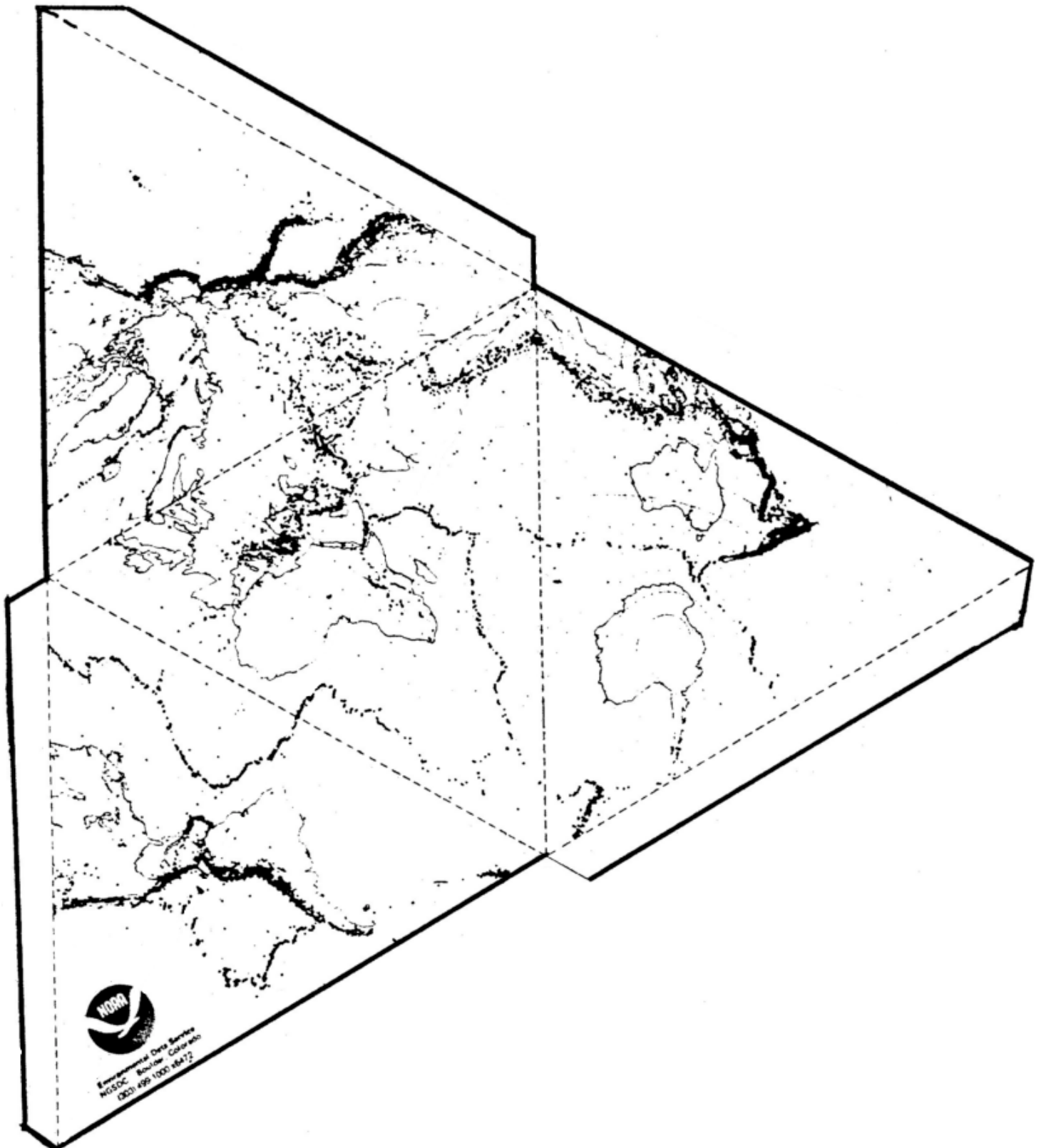


PLATE TECTONIC CYCLE - HAZARDS (5) LAB

PROBLEM: How dangerous are mudslides?

PREDICTION: _____

Some volcanic eruptions can cause massive landslides of mud, rock, debris, and water and debris that cascade down the slope of a volcano. In this lab, you will experiment with different mixtures see if you can find a formula that simulates real mudflows. Instead of mud, you will use flour; instead of rocks you will use corn meal or sand.

MATERIALS: corn meal or sand, water, measuring beakers, cups or other dome shaped objects, dishes, spoons, plastic trays

PROCEDURE: In this experiment you, are trying to create a fast-flowing, dangerous mudflow. You will perform four trials. For each trial, make a different formula of flour sand/cornmeal, and water. Measure the ingredients carefully; you will need to compare them to the rest of your class. After you make each mixture, pour a spoonful of it on top of your cup or dome, which is analogous to a volcano. Describe how the material flows down the side of the “volcano”. Record your measurements and observations in the diagrams below.

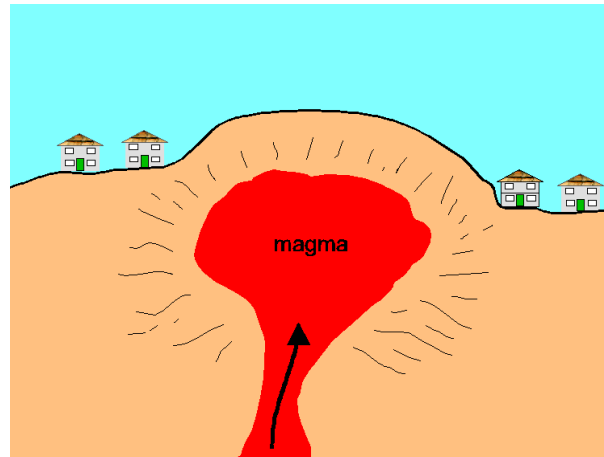
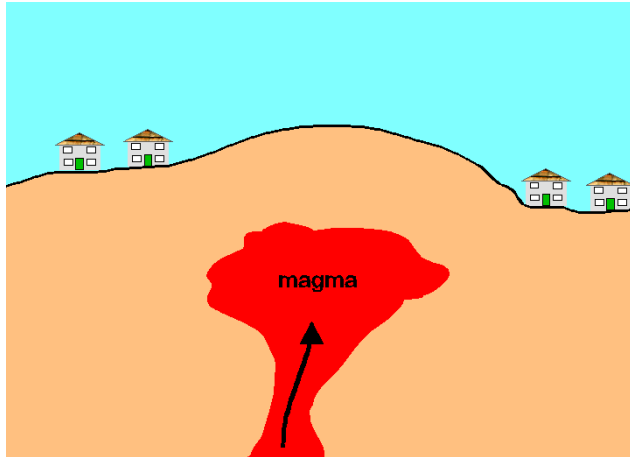
MIXTURES	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL 4
ash (flour)				
rock (sand)				
water				

RESULTS	COMMENTS
TRIAL 1	
TRIAL 2	
TRIAL 3	
TRIAL 4	

CONCLUSION: Which mixture will cause the most damage. Why?

PLATE TECTONIC CYCLE - HAZARDS (5)

POST LAB



1. How can scientists predict that this volcano may erupt?

2. Color in RED the homes that are effected by the eruption of this volcano.

3. What else might be affected by this eruption?

