Geology Web Quest Name

# 1. How do rocks undergo change? <http://www.classzone.com/books/earth_science/terc/content/investigations/es0602/es0602page01.cfm>

a. Use the line and shape drawing functions of your writing program and draw the diagram in step 3. Go back to step 2, and put the name of each process illustrated in the animation on the appropriate arrow.

b. Use your own words to describe the sequence of processes that result in igneous rocks. Describe a specific example of a sedimentary rock becoming an igneous rock.

c. Use your own words to describe the sequence of processes that result in sedimentary rocks. Describe a specific example of a sedimentary rock becoming a new type of sedimentary rock.

d. Use your own words to describe the sequence of processes that result in metamorphic rocks. Describe a specific example of a sedimentary rock becoming a metamorphic rock.

# 2. What is the Earths Crust Like?

# <http://www.classzone.com/books/earth_science/terc/content/investigations/es0801/es0801page01.cfm?chapter_no=investigation>

a. Hypothesize about why volcanoes form linear patterns across the globe. What does this pattern tell you about Earth’s outer shell, or crust?

b. How deep are the deepest earthquakes?

c. What does the lack of earthquakes below the depth you reported in question 2 suggest about the rocks at that depth?

d. How does the orientation (direction) of folded mountain belts compare with nearby zones of volcanoes and earthquakes?

e. What do chains of folded mountains tell you about Earth’s crust?

f. From your examination of the data, describe your mental model of Earth’s crust.

# 3. How fast do tectonic plates move? <http://www.classzone.com/books/earth_science/terc/content/investigations/es0810/es0810page01.cfm?chapter_no=investigation>

a. Which island do you think is youngest? oldest? Explain your reasoning.

b. What pattern do you see between age of rocks and location?

c. How do you think the chain of islands might have formed? Explain your idea.

d. How can you use the map information (from the previous page) to calculate the rate (speed) of plate motion over the hot spot? Describe the information you need and how you’ll use it.

e. Calculate the average rate of the Pacific Plate’s motion over the past 5.1 million years. Express your answer in cm/year.

f. Calculate the average rate of plate motion for 0 - 40 million years ago (since the formation of the Daikakuji Seamount).

g. Calculate the average rate of plate motion for 40 - 60 million years ago (between formation of the Suiko and Daikakuji Seamounts).

h. What does the bend in the chain of seamounts indicate?

i. What global tectonic event might have been responsible for changing the direction of the Pacific Plate’s motion? (What major tectonic event occurred around 40 million years ago?)

j. What evidence is there of a hot spot currently under Yellowstone National Park?

k. In what direction has the North American Plate moved over the hot spot under Yellowstone? Describe your reasoning.

l. Calculate the average rate of the North American Plate’s motion over Yellowstone.

# 4. How are volcanoes related to plate tectonics? <http://www.classzone.com/books/earth_science/terc/content/investigations/es0901/es0901page01.cfm?chapter_no=investigation>

1. Why do you think volcanism on the seafloor occurs directly along a plate boundary, but the Cascade volcanoes occur along a line at some distance from the plate boundary?
2. Where does the magma for volcanism at the rift zone come from?
3. What material is melted to provide magma to the Cascade volcanoes?
4. What type of eruptions would you expect the volcanoes to have?

# 5. How are earthquakes related to plate tectonics?

# <http://www.classzone.com/books/earth_science/terc/content/investigations/es1001/es1001page01.cfm?chapter_no=investigation>

a. Predict where most earthquakes occur.

b. Describe how the pattern of earthquake locations compares to the location of plate boundaries.

c. Which depth range has the most earthquakes? Which depth range has the fewest earthquakes?

d. At what type of plate boundary do you find most deep-focus earthquakes?

e. Explain why deep-focus earthquakes occur at this type of plate boundary but not at others.

f. Which magnitude range has the greatest number of earthquakes? Which has the fewest?

g. Which type of plate boundary experiences the most earthquakes with large magnitudes? Hypothesize about why that type of boundary experiences larger earthquakes than the others.

h. Give three examples of damage that can occur as a result of earthquakes.

i. Which cities are susceptible to earthquake activity? Describe the factors you considered in order to arrive at your answer.

# 6. How does soil vary from place to place? <http://www.classzone.com/books/earth_science/terc/content/investigations/es1206/es1206page01.cfm>

a. Write three observations about the soil in this photo.

b. Identify and describe as many different layers (horizons) as you see in this soil profile.

c. List several similarities and differences across these soils.

d. What relationship do you think might exist between average annual precipitation and topsoil depth?

e. Measure and record the topsoil depth in a table/chart below. Use the function of your word processing program.

f. Use excel to copy and paste a graph of the above chart on this worksheet for this question.

g. Describe any pattern that exists between topsoil depth and average annual precipitation.

h. If you see no evidence for the relationship, suggest another factor you could plot versus topsoil depth to look for a relationship.

7. Weathering and Erosion

a. Click through all the pictures on this page and read the captions. Describe 3 different types of mechanical weathering from these pictures

<http://www.classzone.com/books/earth_science/terc/content/visualizations/es1201/es1201page01.cfm?chapter_no=12>

b. Watch the video and describe the process of chemical weathering in feldspar.

<http://www.classzone.com/books/earth_science/terc/content/visualizations/es1202/es1202page01.cfm?chapter_no=12>

c. Click on the 6 pictures of how erosion has affected landscapes. <http://www.classzone.com/books/earth_science/terc/content/visualizations/es1205/es1205page01.cfm?chapter_no=12> Describe at least 4 ways that erosion can shape landscapes.