

# The Geology of Pacific Northwest Rocks and Minerals

## Mid Term I: Study Guide

### Introduction to Geology:

What is geology? What is physical geology? Name some internal and external processes. What are the two types of time? What are they based upon? What is the scientific method? What is the difference between an hypothesis and a theory? How old are the universe and our solar system?

Can you describe thermal convection (in a ramen pot and in the Earth)? What is the source of heat in the Earth? Why are there different layers inside the Earth (what are the two types of layers, who determined each of the two ways of categorizing the layers)? What do you know about the density of different earth layers? What is the radius of the Earth?

What is a mineral? What is a crystal? What is a rock? What are the three rock types? Can you describe the rock cycle (the major pathways)? What are some differences between the oceans and the continents? What are the two major factors when studying isostasy? Which is thicker, continental crust or oceanic crust?

What are superposition, Original Horizontality, Lateral Continuity, and Cross Cutting Relations? What are the different kinds of unconformities? What is a half-life? What are fossils? What is stratigraphy?

### Plate Tectonics

Name and explain some of the evidences for plate tectonics and continental drift. How do magnetic anomalies form in oceanic crust? How are volcanic chains and seamount chains (like the Hawaiian Islands and the Emperor Seamount Chain) formed? What are some assumptions that form the basis for this interpretation of the formation of these volcano and seamount chains? What are the three types of plate boundaries? What is an example of these (list examples for all six types of plate boundaries)? Describe the vertical deformation through the earthquake cycle at a subduction zone (remember the example with the fingers and the wrist).

What happens when the oceanic crust gets older? How are crust age and depth of the crust below sea-level correlated? Why are the Cascade volcanoes where they are?

What is the average composition of oceanic crust? What about continental crust? Which type of crust is thicker? Which type of crust is denser? How is a tsunami generated? Could you calculate a plate motion rate? What information do you need? If you made a measurement on a map, what are the steps you would take to convert that measurement from a "map distance" to a "real world distance?"

What controls the flow of lava? What controls the shape of volcanoes? Which type of lava has more or less Silica content? How are the different kinds of volcanoes shaped? What are flood basalts? What are the parts of a flood basalt (the layers)? Why do some flood basalts have pillow basalts? Why and how do columnar joints form? What is a Large Igneous Province (LIP)? What is an example of a LIP? If there was a LIP in Oregon, when did it occur and what other active volcanism in Wyoming is related to this LIP?