# Final Study Guide Questions

Geology Fall 2008 Mr. Traeger

Name: _____ Period: _____ Date: _____

The following questions are similar to questions that will be asked on the final exam. Please go through your book and answer them as a way to review for the final. If you answer ALL of them to the best of your ability, you will get an additional 15 points added to your final exam grade! That means that your questions MUST be turned in on the day of the final. The final is cumulative and will cover Preliminary Activities and Chapters 1, 2, 3, 4, 5, 6, 8, 9, 10, and 11. Parts of chapters 29 and 30 were also covered.

| Section | Topic | Questions to Ponder |
|---|---|---|
| **Preliminaries** | | |
| Appendix A: Reference Tables and Appendix C: Skills Handbook | Basic Skills | ▪ What is standard notation and what is scientific notation? How do you convert between the two?<br>▪ How do you convert between units using the factor label method?<br>▪ How do you measure distance, volume, and mass?<br>▪ How do you calculate density?<br>▪ How do you make a line graph? When should it be used?<br>▪ How do you make a bar graph? When should it be used? |
| **Chapter 1: Earth as a System** | | |
| 1.2 | The Earth System's Four Spheres | ▪ What are the four spheres?<br>▪ Is there a fifth sphere not named in the book? What is it?<br>▪ How do the spheres interact?<br>▪ How do interactions change the spheres? |
| **Chapter 2: The Nature of Science** | | |
| 2.1 | The Scientist's Mind | ▪ What is a scientist?<br>▪ Why do scientists do what they do?<br>▪ What is the "scientist's mind"?<br>▪ Do all scientists fit a stereotype?<br>▪ What are qualities of scientific thinking? |
| 2.2 | Scientific Methods of Inquiry | ▪ How do scientists approach questions?<br>▪ What are the steps involved in the scientific method?<br>▪ What is the purpose of peer review?<br>▪ Why is it important to test scientific ideas?<br>▪ What is the difference between scientific theories and laws?<br>▪ How do you design a basic experiment with Control vs. Variable? |
| 2.3 | Scientists Tools | ▪ What kinds of tools do earth scientists use today? |
| **Chapter 3: Earth's Models** | | |
| 3.1 | Modeling the Planet | ▪ What is a map? What are the different types of map projections?<br>▪ What is latitude and longitude?<br>▪ What is map scale? How do you calculate it?<br>▪ How do you draw something to scale using a map scale ratio? |
| 3.2 | Mapmaking and Technology | ▪ What kinds of technology are used to make maps today?<br>▪ What is RADAR and how does it work?<br>▪ What is remote sensing?<br>▪ What is GIS? What are the basic functions of the ArcView GIS we use in class?<br>▪ What is GPS? How does it work? |
| 3.3 | Topographic and Geologic Maps | ▪ What kinds of things are shown on a topographic map?<br>▪ What are contour lines and contour interval?<br>▪ What are slope and elevation and how do you calculate them? Review the formulas for slope.<br>▪ What do the different topographic map symbols mean?<br>▪ How do you use topographic maps? |

**Final Study Guide Questions**

Geology Fall 2008 Mr. Traeger

| Section | Topic | Questions to Ponder |
|---|---|---|
| **Chapter 4: Earth's Structure and Motion** | | |
| 4.1 | Earth's Formation | ▪ How was the solar system formed? What is the nebular hypothesis?<br>▪ Why did Earth become a spheroid?<br>▪ What are the different layers of Earth's interior? What are the characteristics of these layers?<br>▪ Where does earth's heat and magnetic field come from? What is a magnetic field? |
| **Chapter 5: Atoms to Minerals** | | |
| 5.1 | Matter and Atoms | ▪ What is matter?<br>▪ What is an element? A compound?<br>▪ What is the atom? What is its basic structure?<br>▪ What is the periodic table? How do you use it to determine how many protons, neutrons, and electrons an atom has? Know how to read the periodic table!<br>▪ What are ions? How do you calculate the charge on an ion?<br>▪ What are isotopes? How do you figure out the number of protons, neutrons, and electrons in an isotope?<br>▪ What are chemical bonds? What are the different types of bonds?<br>▪ What are Bohr diagrams? How do you make them to explain chemical bonding?<br>▪ What are the characteristics of a metal? A nonmetal? How can you use the periodic table to classify a metal? |
| 5.2 | Composition and Structure of Minerals | ▪ What is a mineral? It's NOT a rock! List the 5 characteristics.<br>▪ How do minerals form?<br>▪ What is crystal structure and how does it determine how a mineral is formed? |
| 5.3 | Identifying Minerals | ▪ What are the physical and chemical properties that you would look for when attempting to identify a mineral? Mohs Scale, streak, etc.<br>▪ What are special properties of a mineral?<br>▪ Could you identify a mineral if given a sample and the right tools?<br>▪ What is specific gravity? How would you calculate it? |
| 5.4 | Mineral Groups | ▪ What are the major mineral groups and how do you tell the difference among them? Think chemical structure!<br>▪ What are some basic uses for minerals? |
| **Chapter 6: Rocks** | | |
| 6.1 | How Rocks Form | ▪ What is a rock?<br>▪ What is the rock cycle? What are the products and processes of the rock cycle? |
| 6.2 | Igneous Rocks | ▪ What are the 2 types of igneous rock and how does each type form?<br>▪ What is Felsic? Mafic?<br>▪ What are characteristics of rocks that form deep in the earth? On the surface? Think intrusive and extrusive!<br>▪ What are igneous rock descriptions? How would you classify igneous rocks into the gabbro, diorite, and granite families?<br>▪ Where would you go to find igneous rocks? |
| 6.3 | Sedimentary Rocks | ▪ What are the 3 types of sedimentary rock and how does each type form?<br>▪ What are features of sedimentary rocks?<br>▪ What are fossils?<br>▪ Where would you go to find sedimentary rocks? |
| 6.4 | Metamorphic Rocks | ▪ How do metamorphic rocks form?<br>▪ What are the 2 types of metamorphism?<br>▪ What are descriptions of metamorphic rocks? What is foliation and how does it help to identify a metamorphic rock? Think gneiss and marble!<br>▪ Where would you go to find metamorphic rocks? |
| **Chapter 8: Plate Tectonics** | | |

**Final Study Guide Questions**

Geology Fall 2008 Mr. Traeger

| Section | Topic | Questions to Ponder |
|---|---|---|
| 8.1 | What is Plate Tectonics? | ▪ What were early ideas of plate tectonics? Think Wegener and Continental Drift!<br>▪ What is the theory of plate tectonics? What types of evidence support it?<br>▪ How does magnetism and rocks ages help to support the theory of plate tectonics? |
| 8.2 | Types of Plate Boundaries | ▪ What are characteristics of convergent, divergent, and transform plate boundaries?<br>▪ What kinds of structures (landforms) would you expect to form at each type of plate boundary? |
| 8.3 | Causes of Plate Movement | ▪ What is mantle convection? Ridge push? Slab pull? |
| 8.4 | Plate Movements and Continental Growth | ▪ What was Pangaea? How did it change over the years?<br>▪ What kinds of evidence did we use to re-construct Pangaea?<br>▪ How do you calculate rates, times, or distances of plate motion?<br>▪ What is Paleomagnetism? How do we use it to reconstruct past worlds? |
| **Chapter 9: Volcanoes** | | |
| 9.1 | How and Where Volcanoes Form | ▪ What is magma and how does it form?<br>▪ Name and describe the 3 types of places where volcanoes form.<br>▪ How did the Hawaiian Islands form? |
| 9.2 | Magma and Erupted Materials | ▪ What are the types of magma?<br>▪ What do viscosity, silica content, and gas content have to do with the explosiveness of a volcano?<br>▪ What are the types of lava flows?<br>▪ What are the ash and rock fragments ejected from a volcano? |
| 9.3 | Volcanic Landforms | ▪ What are the characteristics of shield volcanoes, cinder cones, and composite volcanoes? Where does each type form? Relate this to plate tectonics!<br>▪ What are the major volcanic hazards?<br>▪ What things do volcanologists look for when forecasting a volcanic eruption?<br>▪ How do calderas form?<br>▪ How do volcanoes relate to plate tectonics? |
| **Chapter 10: Earthquakes** | | |
| 10.1 | How and Where Earthquakes Occur | ▪ How do earthquakes relate to plate tectonics?<br>▪ What causes earthquakes?<br>▪ What are the different types of earthquake waves? What are their characteristics? |
| 10.2 | Locating and Measuring Earthquakes | ▪ What is a seismograph and how does it work?<br>▪ How do you interpret a seismogram?<br>▪ How do you locate the epicenter of an earthquake? Know how to read a seismogram, calculate P-S travel time differences, calculate the distance to an earthquake, and triangulate an earthquakeôs epicenter.<br>▪ What is the difference between intensity and magnitude? What scales are used to measure each?<br>▪ By how much does the energy of an earthquake change between scales of magnitude?<br>▪ What is moment magnitude? What are the things that determine the moment magnitude of an earthquake? |
| 10.3 | Earthquake Hazards | ▪ What are hazards associated with earthquakes?<br>▪ What are tsunamis? How do they form? What should you do to avoid getting killed by one?<br>▪ How does the ground type that you live on determine the intensity of the earthquake?<br>▪ What can you do to prevent earthquake damage and loss of life?<br>▪ What goes into a good earthquake safety kit? What makes a good earthquake |

| Section | Topic | Questions to Ponder |
|---|---|---|
| | | safety plan?<br>▪ What should you do when an earthquake strikes? What shouldn't you do?<br>▪ What are the areas of major earthquake risk in the world?<br>▪ Can we predict earthquakes? If so, how?<br>▪ How do differences in engineering determine the amount of damage received by structures? |
| 10.4 | Studying Earth's Interior | ▪ How do we know what's inside the earth based upon earthquake waves?<br>▪ What is the shadow zone, Moho, and transition zone?<br>▪ How do P and S waves behave in each layer? Where do they speed up and where do they slow down? How do waves reflect and refract through the Earth's layers? |
| **Chapter 11: Mountain Building** | | |
| 11.2 | How Mountains Form | ▪ What are the types of stress in the earth?<br>▪ What are synclines and anticlines?<br>▪ Why does oil become trapped in anticlines?<br>▪ What are the types of faults in the earth's crust?<br>▪ What is a hanging wall? What is a foot wall?<br>▪ What is the difference between normal, reverse, thrust, and strike-slip faults? |
| **Chapter 29: Views of the Past (We only talked about sections 29.1 and 29.2 when we did chapter 6 on sedimentary rocks.)** | | |
| 29.1, 29.2, 29.3 | Methods of Looking into the Past | ▪ How do scientists date a rock?<br>▪ What is the difference between absolute and relative dating? What are the shortfalls of each type? How can they be used together<br>▪ What is the importance of fossils to establishing the geologic time scale? |
| **Chapter 30: Geologic Time Scale** | | |
| 30.1 | Geologic Time and the Geologic Time Scale | ▪ How is the geologic time scale organized? What is it based upon?<br>▪ How do evolution and major extinctions determine how the geologic time scale is constructed?<br>▪ What is the difference between Eon, Era, Period, and Epoch?<br>▪ What were the series of astronomical and geological events that set the stage for life to occur on our planet?<br>▪ What is a geologic map and how do you read one? |