

Geo 101, Fall 2000
REVIEW QUESTIONS FOR MIDTERM EXAM
Chapters 1 & 2 & Lectures

THE EXAM IS MONDAY 30 OCTOBER
OR TUESDAY 31 OCTOBER

These questions are to help you study. It will be helpful to work with another student or in small groups to try to answer the review questions. If you can't find the answer in your notes or in the book, please come to office hours or email questions to the instructor. The exam is based on the review questions and the lecture notes. Note that some of the review questions are from the material in the text. The actual exam questions will be multiple choice (except for make-up exams).

Overview of the Earth System

1. Meteorites are the oldest things we've found on earth. How old is Earth, assuming it's the same age as the oldest meteorites? Is that millions, or billions?

2. (Fill in): Earth's _____ sphere is made up of rigid "plates" that move around.

3. What element is most abundant in Earth's core?

4. What were the 2 sources of heat in the early earth that are hypothesized to have contributed to the "iron catastrophe" (sinking of iron to the middle)?
 - a.
 - b.

5. Collision of a Mars-size planet with Earth is hypothesized to account for the formation of the _____. When is this supposed to have occurred?

6. How are the plates moving (relative to each other) at each type of plate boundary?
 - a. mid-ocean ridge
 - b. subduction zone
 - c. transform fault

7. Which types of plate boundaries have lava flows or volcanoes?
8. Which types of plate boundaries have earthquakes?
9. Please name each of Earth's 3 main compositional layers (from surface to center).
10. What is the main heat source inside the Earth today?

Minerals.

1. Which of these require addition of heat energy? (You can also say that they use heat energy.)
melting freezing condensation
boiling evaporation
2. State the law of conservation of matter.
3. Please list the three kinds of particles that make up an atom. Which two are in the nucleus?
4. Please give the charge for each of these 3 kinds of particles (from Question 3).
5. Which of these particles (Ques. 3) is exchanged when chemistry happens between atoms?
6. Which two of these particles contribute to an element's atomic mass? Why isn't the other particle counted?
7. In what 2 ways are all the atoms of a particular element all the same? (One way has to do with "behavior," the other with what they are made of.)

8. Please give the symbol for each of these elements:

oxygen	silicon	aluminum	iron
magnesium	calcium	potassium	sodium
hydrogen	chlorine	nitrogen	
carbon	sulfur	phosphorous	

9. How is an isotope (of an element) defined? Please give examples of an isotope of oxygen and an isotope of carbon.

10. How is a molecule different from an atom?

11. How is a compound different from an element?

12. How is a molecule different from a crystal?

13. Please state three or four defining characteristics of "a mineral." (In other words, what is a mineral?)

a.

b.

c.

14. Please list the three main types of rock. How is each formed?

15. Please give a SYMBOL for silicon.

Please give a FORMULA for a silica tetrahedron.

Please give a FORMULA for quartz.

What is a silicate mineral? [What must it contain?]

16. Please give the name of a mineral made of isolated silica tetrahedra (surrounded by iron and magnesium).

17. Please give the name of the group of minerals made of single chains of silica tetrahedra (plus iron, magnesium, etc.)

18. Please give the name of the group of minerals made of double chains of silica tetrahedra (plus iron, magnesium, etc.)

19. Please give the names of two groups of minerals made of sheets of silica tetrahedra (plus other elements). In one group, the sheets are very tiny (microscopic).

a.

b.

20. List three minerals (two are closely related to each other) made of silica frameworks.

a.

b.

c.

21. Which silicate mineral structure (Ques. 15 - 19) has the lowest proportion of silica? What is the name of the mineral?

22. Which mineral has the highest proportion of silica (100% silica)?

ADDITIONAL QUESTIONS FROM (or inspired by) THE TEXT:

1. Please list some evidence in support of the plate tectonics theory. Which items on your list were known by Alfred Wegener, the "grandfather" of plate tectonics theory? (See box 1.1)

2. Why is the theory of plate tectonics called a theory? Is it because it is incorrect? Uncertain? Proven? A dogmatic belief? Strongly supported by the evidence? (See particularly p. 4 & 18-19.)

3. Density is defined as mass divided by volume (for example, grams per cubic centimeter). Specific gravity of a substance is its density divided by the density of water. (The text defines it in different words but it means the same thing.)

Why does specific gravity have no units? [Hint: write out the definition as a formula. Cancel units as in dimensional analysis. What do you get?]

For each of the following substances, do you think its specific gravity is less than 1.0, or greater than 1.0?

a human (living and breathing)?

a tree? (How can you tell?)

a fish? jellyfish? How do you think they move up and down in the water? (o.k., no fair, that's biology.)

a rock?

Which is more dense, a rock or a tree?