

Geology 001 Exam 1 Review – Planet Earth: An Owners Manual

Review all questions discussed in class (see Presentation PDFs for review)

Earth Systems:

Hydrosphere – location of reservoirs of salt and fresh water, water cycle

Atmosphere – composition of Earth's atmosphere

Greenhouse effect – what causes it? What are the important greenhouse gases?

Ozone layer – why is it important (hint: ozone is NOT an important greenhouse gas)

Biosphere – life

Geosphere – Earth has distinct continents and oceans basins, extensive mountain systems, lack of craters, active volcanoes – surface constantly being remade.

Minerals

Definition of a mineral (solid, crystalline, naturally occurring, distinct elemental composition)

Mineral properties (luster, hardness, cleavage, streak, etc.)

Relation of mineral properties to crystal structure (diamond vs. graphite)

Silicate minerals (silicate tetrahedron) – four atomic bonding sites allows complex structures such as chains, sheets, and 3-D frameworks.

Carbonates (calcite – cement), Phosphates (apatite – bones, teeth), Sulfates (gypsum – plaster)

Halides (halite – salt), Oxides and Sulfides (simple compounds – ore minerals), Native elements

Earth's Interior Machine:

How do we investigate the interior of the Earth? Density measurements, seismic waves

Layered structure of the Earth: Inner Core, Outer Core, Mantle, Asthenosphere, Lithosphere (upper Mantle + Crust)

Physical state of different layers in the Earth – what causes some layers to be solid, others liquid or plastic? Relationship between depth, temperature, and pressure in the Earth's interior

Magnetic field – how is it generated? Why is it important? What is an aurora?

Plate tectonics – lithosphere and asthenosphere. What drives the motion of plates (rising heat, pull of gravity – “lava lamp”)? What causes volcanoes at divergent plate boundaries? What causes volcanoes at convergent plate boundaries? What happens when water is added to rock in the mantle? How does the recycling of the Earth's lithosphere create continental crust? Why don't Mars and Venus have continents?