**Earth Science Exam Study Guide**

For extra credit: complete this study guide with the correct answers and have parents **sign** here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

As a witness that you studied at least 15 minutes or more each night Mon-Wed.

For Mrs. Yacavone

**Chapter 3 – Structure of the Earth**

* **Earth’s Layers:**
  + List the 4 layers of earth from Outside to the center and it’s state of matter:

|  |  |
| --- | --- |
| **Layer** | **State of matter (solid or liquid)** |
|  |  |
|  |  |
|  |  |
|  |  |

* + Scientists primarily used evidence from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during earthquakes to develop theories about the structure of the inside of the earth.
  + How does the mantle form convection currents? (IAN pg 13)
    - The Lower Mantle is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which changes it’s density.
    - The hotter, lower mantle becomes less \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and rises
    - Gravity pulls the cooler, more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ upper mantle down
    - A circular motion called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forms.
  + The crust is broken into pieces called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which move on top of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because it has convection currents
* **Rock Cycle** – any type of rock can transform into another type of rock if it’s in the right environment and it goes through the right steps. (fill in the blanks on the chart below)

|  |  |
| --- | --- |
| **Type of Rock** | **Steps required to make it? (name and DEFINE/describe)** |
| Sedimentary Rock | 1.  2.  3.  4.  5. |
| ? | Transforms existing rock into new rock when under intense heat and pressure |
| Igneous Rock | 1.  2. Cool  3. |

**Chapter 4 Earth’s History**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - the preserved remains or traces of ancient organisms
  + 6 types: molds, casts, trace, carbon-film, preserved remains, petrified fossils
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ –** the collection of fossils found and studies by scientists in order to gather information about the history of life on earth and past environments.
  + We have learned the following from this record:
    - The history of life on earth and what species have gone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - The evolution of life on earth
    - Past environments or climates on earth
* Ages of Rocks
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Age – comparing the age of a rock to another rock
    - The following rules apply to determining this type of rock age: the Law of Superposition, intrusions, extrusions, unconformities, and faults
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Age – the actual number of years since the rock formed
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ measures the time it takes for half of the radioactive element in the rock to break down into a stable element. Monitoring this radioactive decay and entering these and other measurements in a formula allows scientists to calculate the rock’s actual age.

**Chapter 5 Plate Tectonics**

* The Theory of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ improved upon Wegener’s hypothesis of Continental Drift because it explained HOW \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* This theory states that the earth’s crust is broken into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the mantle.
* Scientific data shows that the plates move an average of \_\_\_\_\_\_\_ to \_\_\_\_\_\_\_ centimeters per year, which is about how much your fingernails grow in one year.
  + Evidence to support this Theory includes:
    - Wegener’s evidence of Continental Drift: puzzle-like fit, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Climate, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Sea-floor Spreading – caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ moving the plates and pulling apart a divergent boundary
      * Pillow lava
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - how the magnetic minerals were distributed evenly on both sides of the mid-ocean ridge.
      * Ages of the Rocks on both sides of the ridge

**Chapter 7 Earthquakes**

* Stress builds up in the rock layers as the tectonic plates move. This build-up of stress causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to form.
* When the rocks slip or break during tectonic plate movement, vibrations, called \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ travel through the earth. The shaking and trembling of the rock layers that results from these vibrations is known as an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Too much stress can lead to Earthquakes and strain, or the change in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or volume of the rock layers.
* Scientists use a special instrument called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to measure the magnitude of an earthquake.
* Earthquakes occur most often along \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ boundaries.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Types of Faults and related forces:** (fill in the blanks on the chart below) | | | | |
| **Fault** | **Boundary** | **Movement** | **Stress** | **Strain** |
| Normal |  | Pulling apart/away from each other; hanging wall slides down the footwall. |  | thinning of crust, forms rift valleys and mid-ocean ridges |
|  | Convergent |  | Compression |  |
| Strike-Slip | \_\_\_\_\_\_\_\_\_\_\_\_\_  Ex: California’s west coast | Sliding past horizontally in opposite directions |  | causes earthquakes |

**Chapter 6 Volcanoes**

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a type of mountain that forms in the earth’s crust when molten material called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaches the earth’s surface.
* Eruptions can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or explosive. The type of eruption is determined by the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the magma.
* Many small \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ near a volcano is a sign that is may erupt soon.
* The pressure building-up from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the magma provide the force needed to make the volcano erupt.
* Most volcanoes form near the edges of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ boundaries, for ex:
  + At \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ boundaries under the ocean, along mid-ocean ridges because of sea-floor spreading or on the continents in a rift valley.
  + At \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ boundaries when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ zones form where two pieces of oceanic crust collide, or when oceanic crust collides with continental crust. This is because the crust that is being subducted is melting and forming a hot source of magma that rises.

**Ch 8 Land, Air, and Water Resources**

* \*All living things, including humans, depend on non-living resources in the environment such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_, air, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in order to survive.
* \*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are the main living thing responsible for polluting these renewable resources, which causes harm to themselves and to other living things.
* \*Pollution and destruction of habitats caused by humans is largely responsible for the increased rate of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of other species, meaning these species no longer exist on earth.
* The \*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a natural process that helps trap some heat from the sun in the earth’s atmosphere to maintain an average Earth temperature of 59°F. This happens because certain gases in the environment allow the sun’s heat to be trapped in the atmosphere to keep the earth warm. However, too much of a good thing can lead to bad things.
* \*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a trend where the average overall temperature of the earth is increasing. Scientists have learned this trend is rising at a faster rate because of humans releasing greenhouse cases as a higher rate than normal. Most come from the \*burning of fossil fuels in cars, factories and electricity production. \*The gas responsible for the most warming is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, also called CO2.
* \*items in the table below will be addressed on the exam

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Resource** | **Type of pollution** | **Causes** | **Effects** | **Possible solutions** |
| Air | Emissions | burning \*\_\_\_\_\_\_\_\_ fuels to run motor vehicles, industrial factories, and coal power plants | Increases \*\_\_\_\_\_\_\_in the atmosphere, a greenhouse gas, which then forms low-lying toxic ozone | Ride bikes, walk, \_\_\_\_\_\_\_\_\_\_ use of motor vehicles and electricity; Improve processes at factories and plants to reduce emissions. |
| Methane released from animals and degrading waste at landfills | Increases the \*\_\_\_\_\_\_\_\_\_\_\_\_\_effect and can cause temperature inversion | Reduce waste sent to landfills by following the 3 Rs reduce, reuse, recycle. |
| Land | Nutrient depletion | Over growing Agriculture to support overpopulation which leads to a loss of nutrients in the soil and difficulty growing more plants | desertification,  \*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of land | Crop rotation, alternating sections of land for agriculture, composting |
| Development | Urbanization, Industrialization, mining | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – reduction plants, loss of habitat and ecosystems, which can lead to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of species | Land reclamation, reduction of urbanization and industrialization |
| Water | Agricultural wastes | \*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, fertilizer or animal waste run-off into ponds and other waterways | Leads to eutrophication due to increased algae, then bacteria, and eventually death of a pond-water ecosystem | Reduce the use of fertilizers and pesticides, follow all directions carefully when used |
| Industrial waste | Waste from factories pumped/dumped into waterways | Chemicals harm bodies of water and organisms in them | Recycle wastes, reduce production of waste, make environmentally safe products |
| Sewage | Human waste from sinks, showers, toilets | Increases disease-causing organisms in the water | Increase sewage treatment to remove sewage from water |
|  | Sediments | Erosion from soil, construction, etc. | Covers food sources, nests, eggs | Reduce erosion by planting, plants roots hold dirt. |