2.1 – Guided Notes

Objectives

- Describe the size and shape of Earth.
- Describe the compositional and structural layers of Earth's interior.
- Identify the possible source of Earth's magnetic field.
- Summarize Newton's law of gravitation.

Earth Basics

- Earth is the _____ planet from the sun in our solar system.
- Earth formed about 4.6 billion years ago and is made mostly of _____.
- Approximately _____% of Earth's surface is covered by a thin layer of water known as the *global ocean*.
- Earth is an oblate _____, or a slightly flattened sphere. Earth's pole-to-pole circumference is 40,007 km. Its equatorial circumference is 40,074 km.
- Earth's average _____ is 12,756 km.

Earth's Interior

- Scientists have made important discoveries about Earth's interior through studies of _____ waves.
- Seismic waves are vibrations that travel through Earth and that are caused by _____ and by explosions near Earth's surface.
- By studying seismic waves as they travel through Earth, scientists have determined that Earth is made up of _____ major compositional zones and _____ major structural zones.

Compositional Zones of Earth's Interior

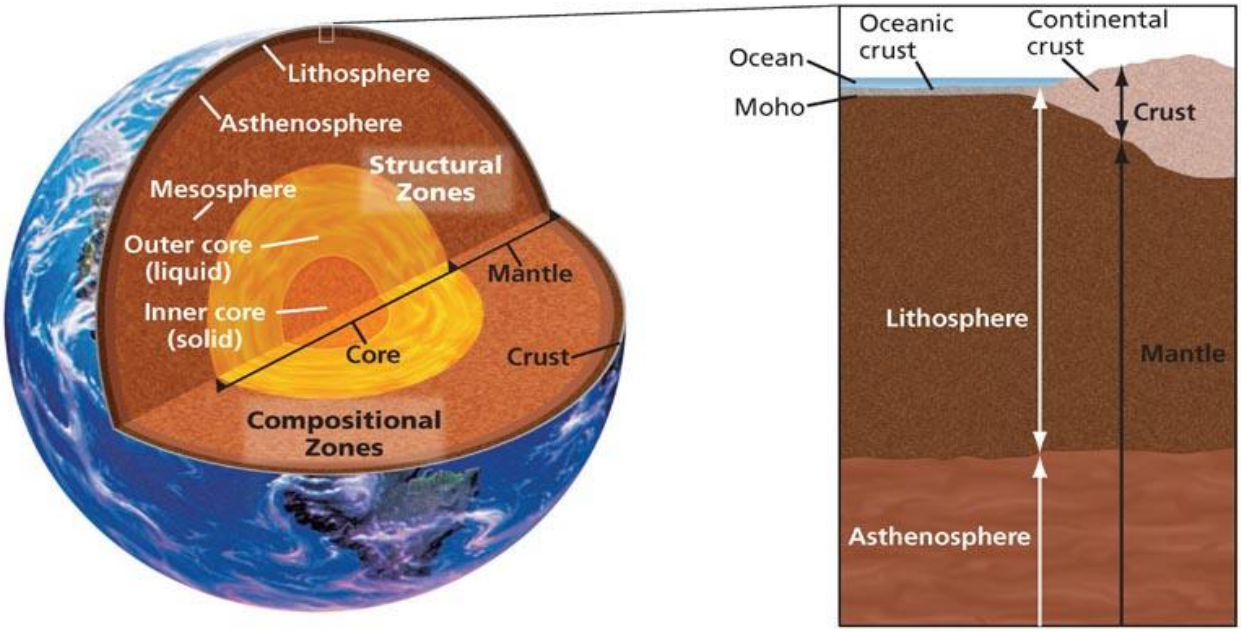
- **_____** the thin and solid outermost layer of Earth that lies above the mantle
- _____ crust, which lies under the oceans, is only 5 to 10 km thick. The _____ crust varies in thickness from 15 km to 80 km.
- **_____** in Earth science, the layer of rock that lies between Earth's crust and core
- The mantle is nearly 2,900 km thick and makes up almost two-thirds.
- **_____** the central part of Earth that lies below the mantle
- The center of Earth is a sphere composed mainly of _____ and _____ whose radius is about 3,500 km.

Structural Zones of Earth's Interior

- The three compositional zones of Earth's interior are divided into five structural zones.
- **_____** the solid, outer layer of Earth that consists of the crust and the rigid upper part of the mantle
- The rigid lithosphere is between 15km and 300 km thick.

- _____ the solid, plastic layer of the mantle beneath the lithosphere; made of mantle rock that flows very slowly, which allows tectonic plates to move on top of it
- The plastic asthenosphere is about 200 km thick.
- _____ literally, the "middle sphere"; the strong, lower part of the mantle between the asthenosphere and the outer core
- The mesosphere reaches from the bottom of the asthenosphere to a depth of about _____ km.
- Below the mesosphere is the _____ outer core.
- The outer core surrounds the _____ inner core, which begins at a depth of 5,150 km.

The diagram below shows the layers of Earth's interior.



Earth as a Magnet

- Earth's magnetic field extends beyond the atmosphere and affects a region of space called the _____.
- Scientists think that motions within the liquid iron of Earth's outer core produce electric _____ that in turn create Earth's magnetic field.

Earth's Gravity

- Gravity is the force of _____ that exists between all matter in the universe.
- According to _____'s law of gravitation, the force of attraction between any two objects depends on the _____ of the objects and the _____ between the objects.
- The _____ the masses of two objects are and the closer together the objects are, the greater the force of gravity between the objects will be.

Weight and Mass

- Weight is a measure of the _____ of the pull of gravity on an object.
- An object's weight depends on its mass and its distance from Earth's _____.

Weight and Location

- Because the distance between Earth's surface and its center is greater at the equator than at the poles, the weight of an object at the equator is about _____% less than its weight at the North Pole.