**The Earth Notes:**

**Unit 1: Materials and Processes that Shape a Planet**

**Mini-Unit:** The Earth

**Goal 1**: The student will demonstrate the ability to use concepts of system analysis to identify major topics in geology and to discuss their relationship to other fields of Earth and Space Science.

**Objectives – The student will be able to:**

* Identify and describe the components of the physical Earth as a system (inner core, outer core, mantle, crust)
* Explain and give examples of the dynamic balance between matter and energy with and on the physical Earth
* Give examples of how changes n the physical Earth affect other Earth systems and human activity

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Earth Basics:

Earth is unique because:

1. Only planet in solar system with liquid water on surface
2. Only planet in solar system with an atmosphere with a large proportion as oxygen
3. Only known planet in the universe that supports life

Basic Facts:

1. 4.6 Billion years old
2. Made mostly of rock
3. 71% of surface covered with water
4. Slightly flatted sphere shaped
5. Rotates on its axis

Interior of the Earth:

Layers of the Earth:

1. Crust
2. Mantle
3. Core

Crust – thin, solid, outermost layer of the Earth that makes up less than 1% than the mass of the Earth

 Two Types of Crust:

1. Oceanic
2. Continental

Mantle – layer of “solid-ish” rock located between the crust and the mantle, able to flow through convection currents, denser than the crust, makes up 2/3 of the Earth’s mass

Moho – layer/border between the crust and mantle

Core – central part of the Earth below the mantle

 Two parts:

1. Outer core – liquid
2. Inner core – solid

Properties of the Earth:

Magnetism – The Earth has a magnetic north pole and a magnetic south pole that creates a magnetic field around it

Gravity – The force of attraction that exists between all objects, the bigger and closer an object is, the stronger the force of gravity

Weight – the measure of the force of gravity on an object, therefore the farther you are away from Earth, the less you weight, though mass (measure of the amount of matter) remains constant

Mass and Energy:

Matter – anything that has mass and volume

 Ex: protons, neutrons, bacteria, atoms, feathers, rocks, etc.

Energy – the ability to do work, cannot be created or destroyed, only change forms

 Many form:

1. Heat
2. Light
3. Movement
4. Potential to move
5. Electromagnetic waves

Energy enters the Earth as sunlight and either absorbed by substances or organisms on the Earth, or reflected/released back into space as heat.

Very little matter enters or leaves the Earth, however, it is constantly changing forms within the confines of Earth and its atmosphere.

Protons, electrons, and neutrons make atoms; atoms make up elements; elements make up compounds; all make up matter

Matter can exists in solid, liquid, and gaseous forms

The Earth’s Four Spheres:

1. Atmosphere – a mixture of gases that surrounds a planet or moon
2. Hydrosphere – the portion of Earth that is water
3. Geosphere – the mostly solid, rocky part of the Earth; extends from the center of the core to the surface of the crust
4. Biosphere – the part of Earth where life exists; includes all the living organisms on Earth