

Chapter 13, Physical Geography: The Earth's Interior, Crust, and Plate Tectonics

Geomorphology-What's that?

Landforms and Geomorphic Processes

Theories of landform Development

1) Catastrophism

2) Uniformitarianism

Tectonic Processes are balanced by gradational processes.

Tectonic Processes are powered by:

Gradational processes are powered by:

Examples of Gradational Processes:

1) Weathering

a) Mechanical

b) Chemical

2) Mass Wasting

Both of these gradational processes are part of erosion (the removal of sediment), but also part of deposition (and the transport of materials to a new location).

The Structure of the Earth

The *Earth is density stratified*. How do we know?

Earthquake Waves are density sensitive.

The Parts of the Earth from a Geophysical Point of View

The Core

1) Composition

Outer

Inner

2) Evidence and Proof

The CMB

The Mesosphere (Lower Mantle)

The Asthenosphere

The Lithosphere

The Parts of the Earth From a Compositional Point of View

The Core

1) Composition

2) Evidence and Proof

The Mantle

>Constitutes two thirds of the Earth's mass.

Other Characteristics:

The Crust

1) Oceanic Crust

Composition

Thickness

2) Continental Crust

Composition

Thickness

Insert the cool diagram here showing the relationship between the Geophysical View and the Compositional View.

The Composition of the Earth's Crust

Atoms>>>Elements>>>Minerals>>>Rocks>>>Continents

Bedrock: solid rock that underlies the surface material of the Earth.

Regolith: the layer above the bedrock, usually composed of weathered down bedrock.

Outcrop: exposure of rock at the Earth's surface.

Mineral Classification

What does it take to be a mineral?

1)

2)

3)

4)

5)

Mineral Groups:

1) Silicates: the most common group

>Based on the silica tetrahedron

>Constitute 92% of the Earth's crust

2) Nonsilicates(the main ones)

a) Ores

1) Oxides

2) Sulfides

b) Evaporites

1) Halides

2) Sulfates

c) Carbonates

>Most are soluble in water.

The Classification of Rocks

1) *Igneous Rocks*

a) Plutonic or intrusive (from magma)

b) Volcanic or extrusive (from lava)

Commonly, igneous rock are jointed or crack, which allow them to be weathered relatively easily.

2) *Sedimentary Rocks*

a) Clastic Rocks

- b) Organic
- c) Chemical

Sedimentary Structures

- a) Stratification
 - >Strata or bedding
- b) Cross Bedding
- c) Graded Bedding

3) *Metamorphic Rocks*

- a) Foliated Rocks
- b) Nonfoliated

The Rocks Cycle

Plate Tectonics: a unifying theory

1) Continental Drift: A. Wegener

- a) When?
- b) Evidence?
 - 1)
 - 2)
 - 3)
 - 4)
 - 5)

2) Supporting Evidence for Continental Drift

- a) Paleomagnetism
- b) Seafloor Spreading: Harry Hess

3) Plate Tectonics=all of the above with a little added technology.

Plate Boundary Types:

- a) Divergent

b) Convergent

c) Transform

Continents grow via Plate Tectonics through the process of accretion.
Continents have been moving dynamically since the Earth's inception.

Insert one more Gorgeous diagram here....