Unit 1
Introduction To Earth Science

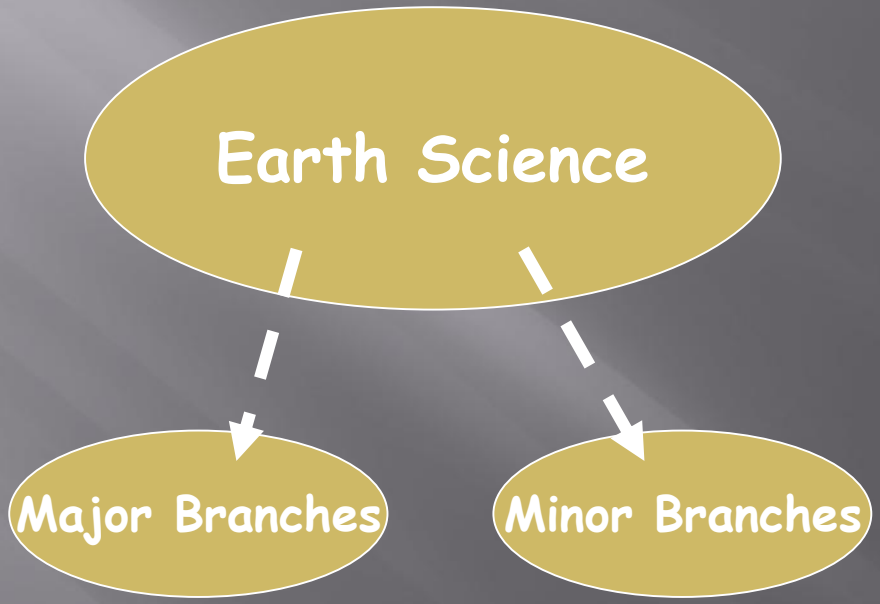
Topic 1: Earth Systems As A Science

- Earth Science differs from other sciences in that:

1. Earth Science has a global perspective. Things are often looked at as part of a series of interactions.

2. Earth Science draws from all other areas of science such as physics, chemistry, biology, astronomy, meteorology, etc. For this reason, earth scientists must be trained in a variety of areas.

3. Earth Science requires a consideration of vast amounts of time with sequencing of events (chronology) and ages.


Earth Science
Major Branches
Minor Branches

Major Branches of Earth Science

- Geology: The science that examines earth, its form and composition, and the changes it has undergone and is undergoing.
- Meteorology: The scientific study of the atmosphere and atmospheric phenomena; the study of weather and climate.
- Astronomy: The scientific study of the universe; it includes the observation and interpretation of celestial bodies and phenomena.
- Oceanography: The scientific study of the oceans and oceanic phenomena.

Minor Branches Of Earth Science

- Can you list some?

Minor Branches Of Earth Science

Crystallography
Geochemistry
Geophysics
Geomorphology
Hydrology
Mineralogy
Paleontology
Petrology
Seismology
Stratigraphy
Volcanology

ACTIVITY (Will be done in class using visuals):

- Work in groups to develop brief descriptions of each field of study (or branch).

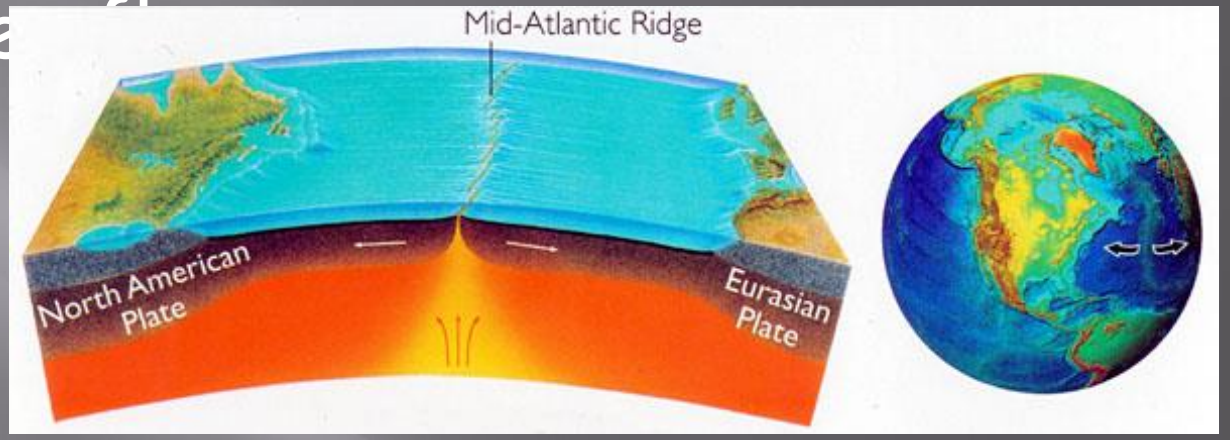
- Then categorize the terms under the main branches of Earth science, which include: astronomy; geology; oceanography; and meteorology.

How is Earth Science related to other scientific fields?

- In a system approach, Earth Science integrates many other sciences.
- Like other sciences, Earth Science can approach problems in a systematic method (i.e. scientific method). In this regard, Earth Science is related to other scientific fields.
- ***Who can think of specific examples to prove the relationship?***

Examples

- Oceanographers - Use geologists to study rocks on the se

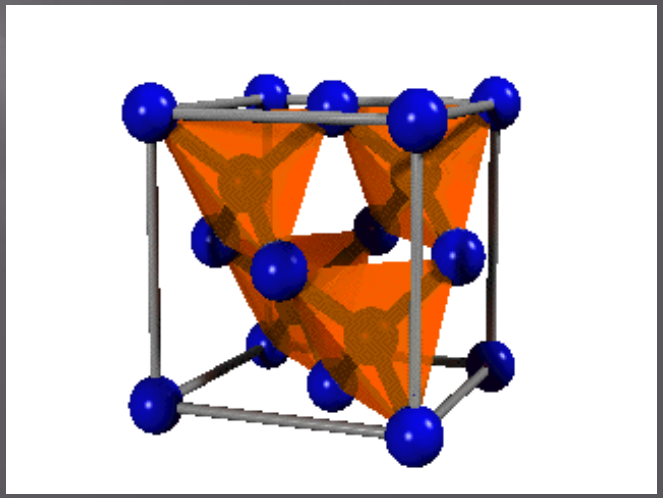


- Biologists - Use paleontologists to study fossils, which demonstrates the evolution of life.

Examples

- Geologists - Use physicists in search for minerals and to better understand the forces that lead to faulting and folding.

- Mineralogy – Use chemists to better understand mineral properties as well as the composition of minerals.



Branches of Earth Science: Another Way of Classifying

Earth Science is the name for all the sciences that collectively seek to understand Earth and its neighbours in space.

Different branches study the different parts of Earth;

1) Solid Earth

2) Liquid Earth

3) Gaseous Earth

4) Space

Reference:

Tarbuck and Lutgens text, Pages 5 - 7

Solid Earth

Geology – study of the solid Earth

• Divided into two broad areas;

1) ***Physical Geology*** - examines the materials composing Earth and seeks to understand processes that operate beneath and upon its surface.

2) ***Historical Geology*** – seeks an understanding of the origin of Earth and the development of the planet through its 4.6 billion year history.

Solid Earth

Seismology – study of earthquakes and seismic waves

Paleontology – study of fossils and life on Earth

Geomorphology – study of landscape features on Earth

Mineralology – study of minerals

Volcanology – study of volcanic activity

Liquid Earth

Oceanography

- study of the oceans and oceanic phenomena

- study of the composition and movements of sea water, as . well as coastal processes, seafloor topography, and marine life

Hydrology

- study of Earth's fresh water systems

- including, rivers, streams, and groundwater

Gaseous Earth

Meteorology – study of the atmosphere; weather and climate

Space

Astronomy – the scientific study of the universe and the relationship between Earth and the universe. It focuses on the observation and interpretation of celestial bodies in space.