What Is Earth/Environmental Science?

What Is EE?

Topics

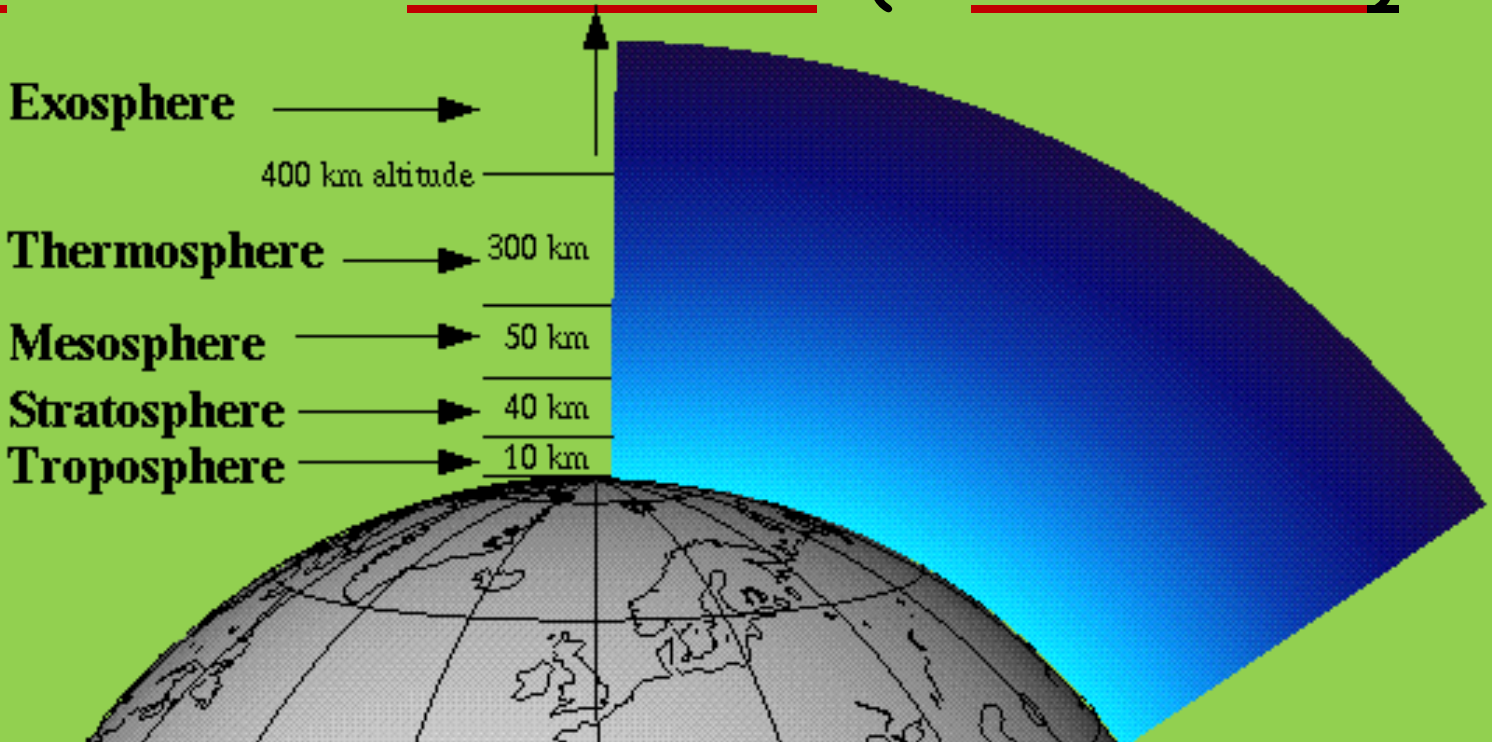
1. Earth's Major Spheres
2. What is Earth Science?
3. What is Environmental Science?
4. Earth System Science

A View of Earth

Earth's Major Spheres

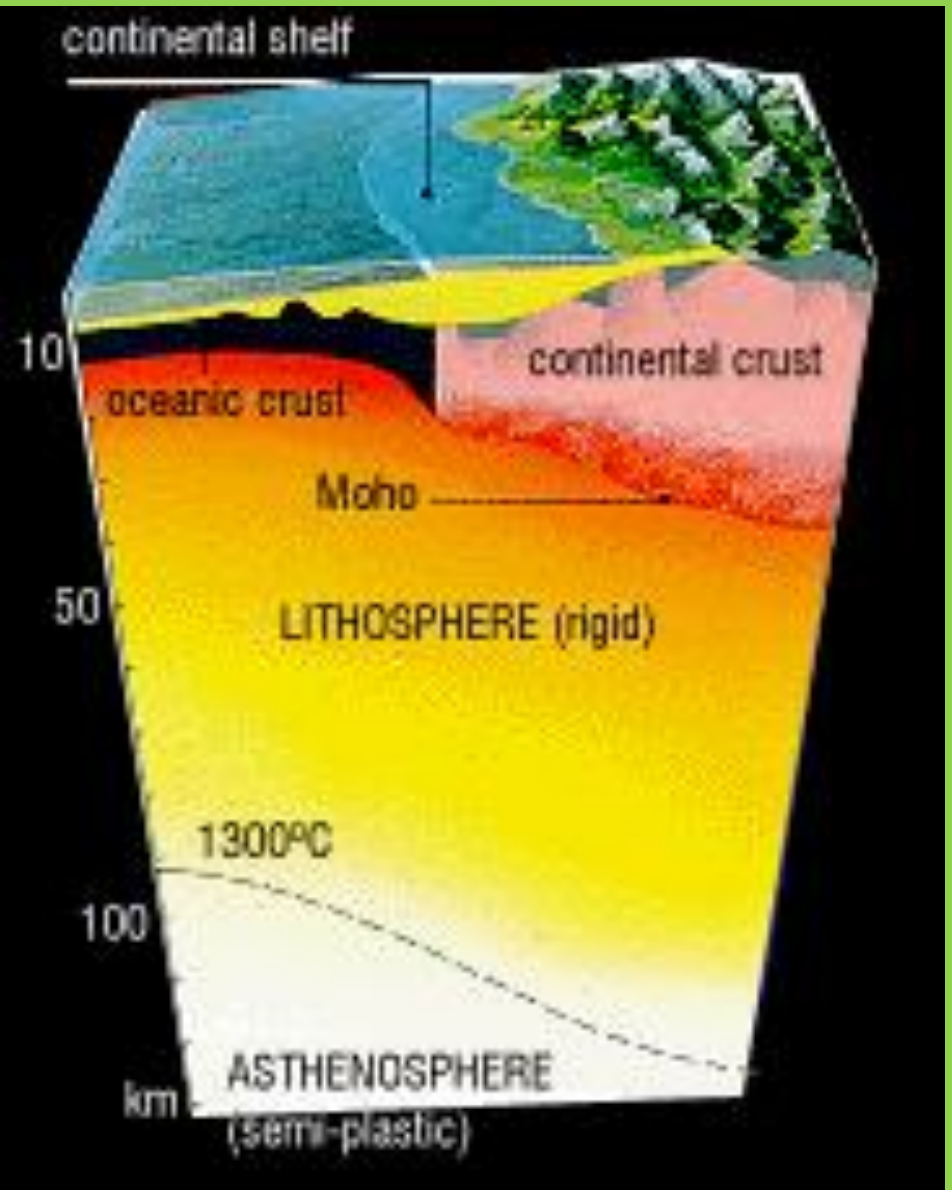
Atmosphere

- Thin, gaseous envelope **surrounding Earth**
- Sustains **life** on Earth
- 100 km thick, (600 miles) but 90% is **condensed** in the 1st **10-15 km**. (~ **6-9 miles**)

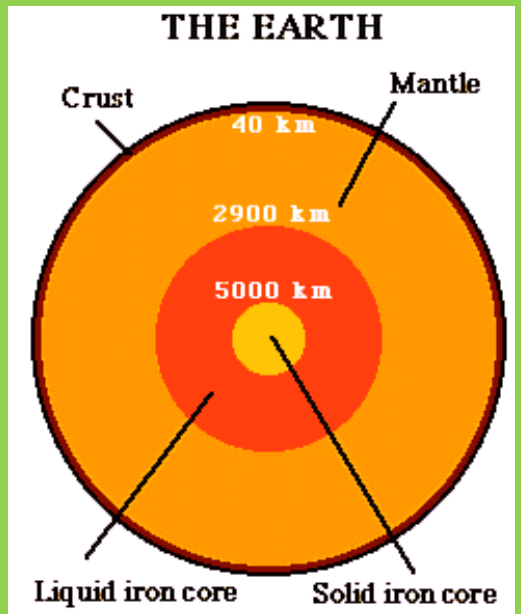


Geosphere

- "Round Stone" – Core, Mantle, & Crust

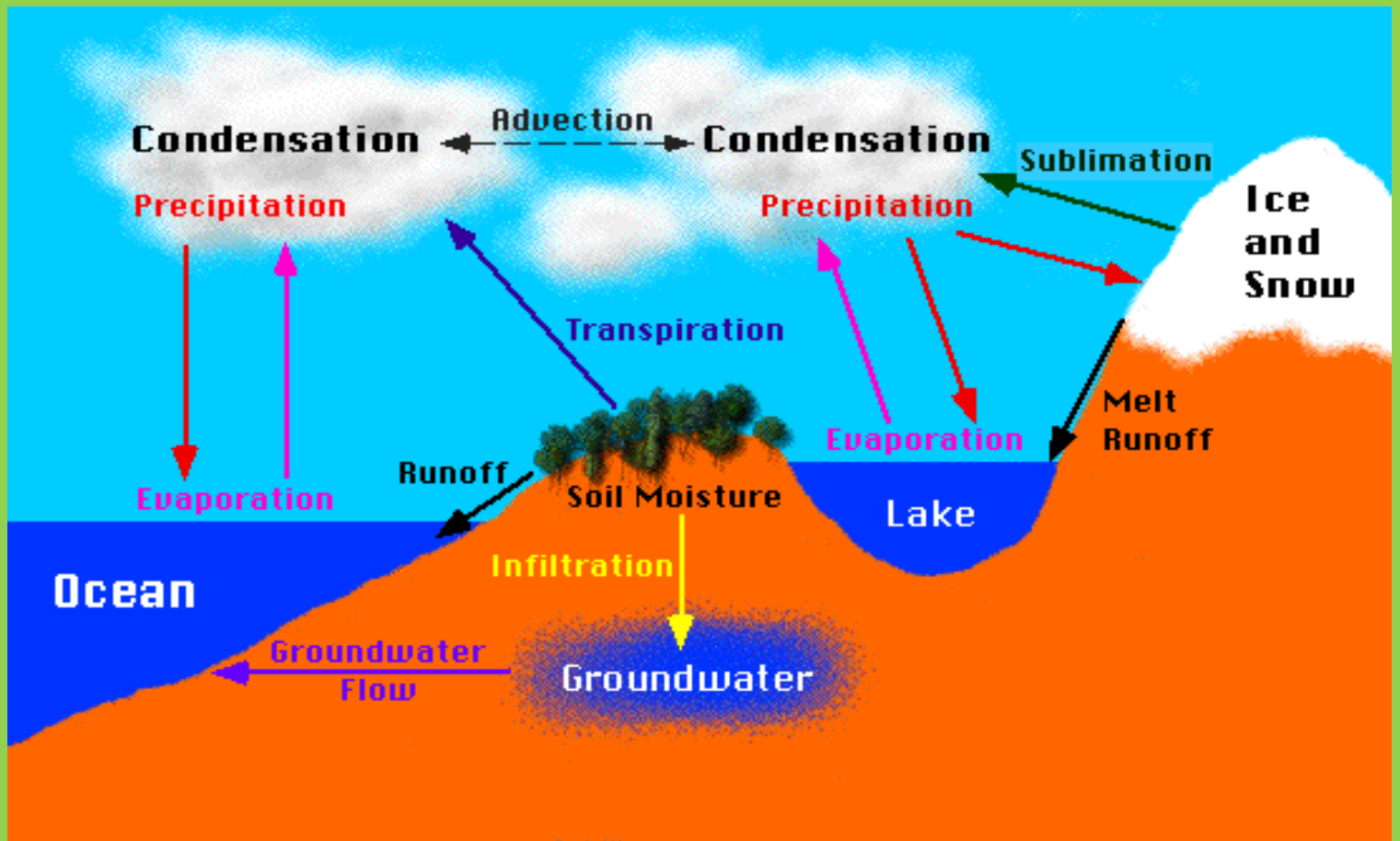


- **Lithosphere** – **the crust & upper mantle**
- **Asthenosphere** – **the molten upper mantle**

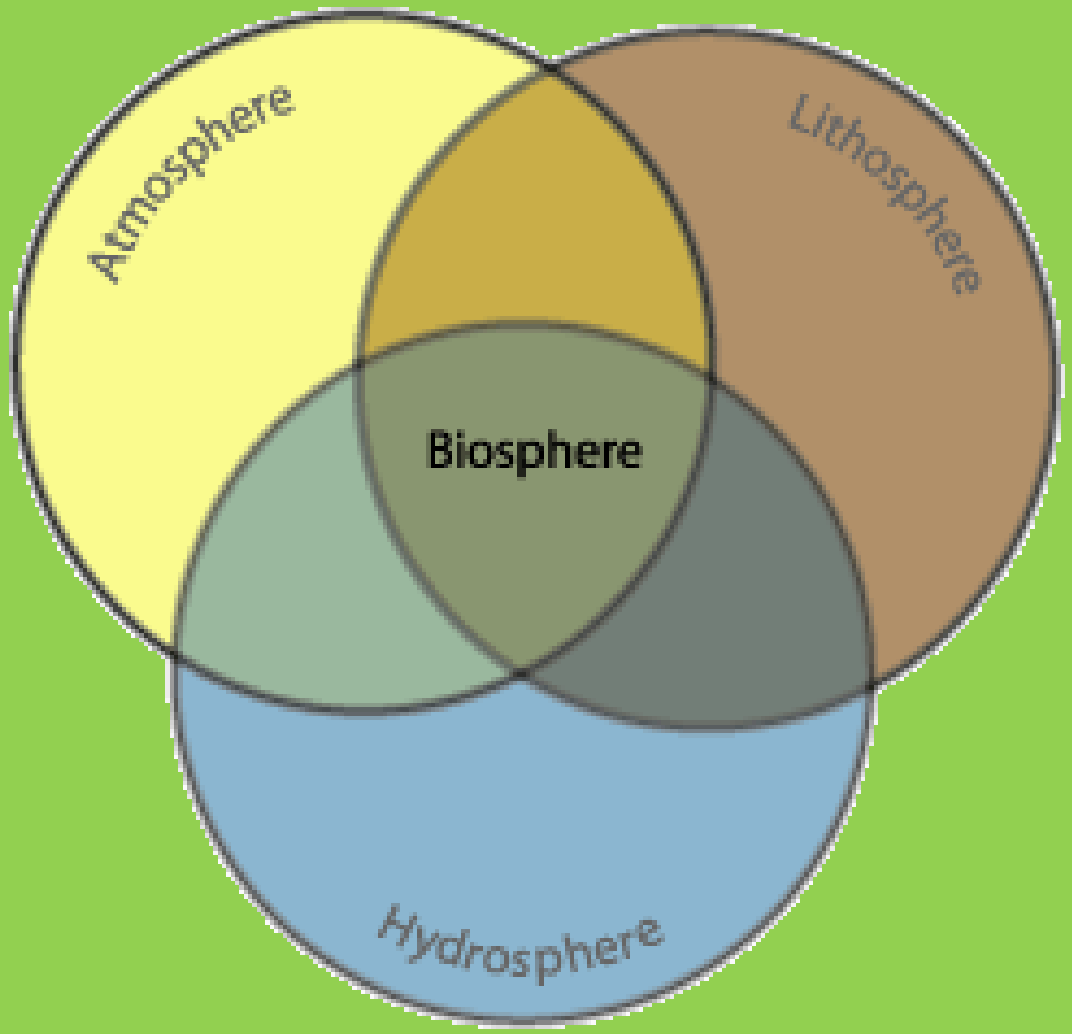


Hydrosphere

- All of the Water on the Earth
- Continuously cycling
- 97% Salt, 3% Fresh



Biosphere



- Includes all life on Earth
- Extends from the **seafloor** up to the **atmosphere**

What is Earth Science?

4 Branches of Earth Science

1. **Geology** → The study of the Earth
   - Physical Geology – **Earth's materials & processes**
   - Historical Geology – **Earth's timeline of changes**
2. **Hydrology** – The study of fresh water and salt water (Oceanography)
3. **Meteorology** – The study of the atmosphere, weather, & climate
4. **Astronomy** – The study of the universe

What is Environmental Science?

Environmental Science – the study of the impact of humans on the environment

- **Goal:**

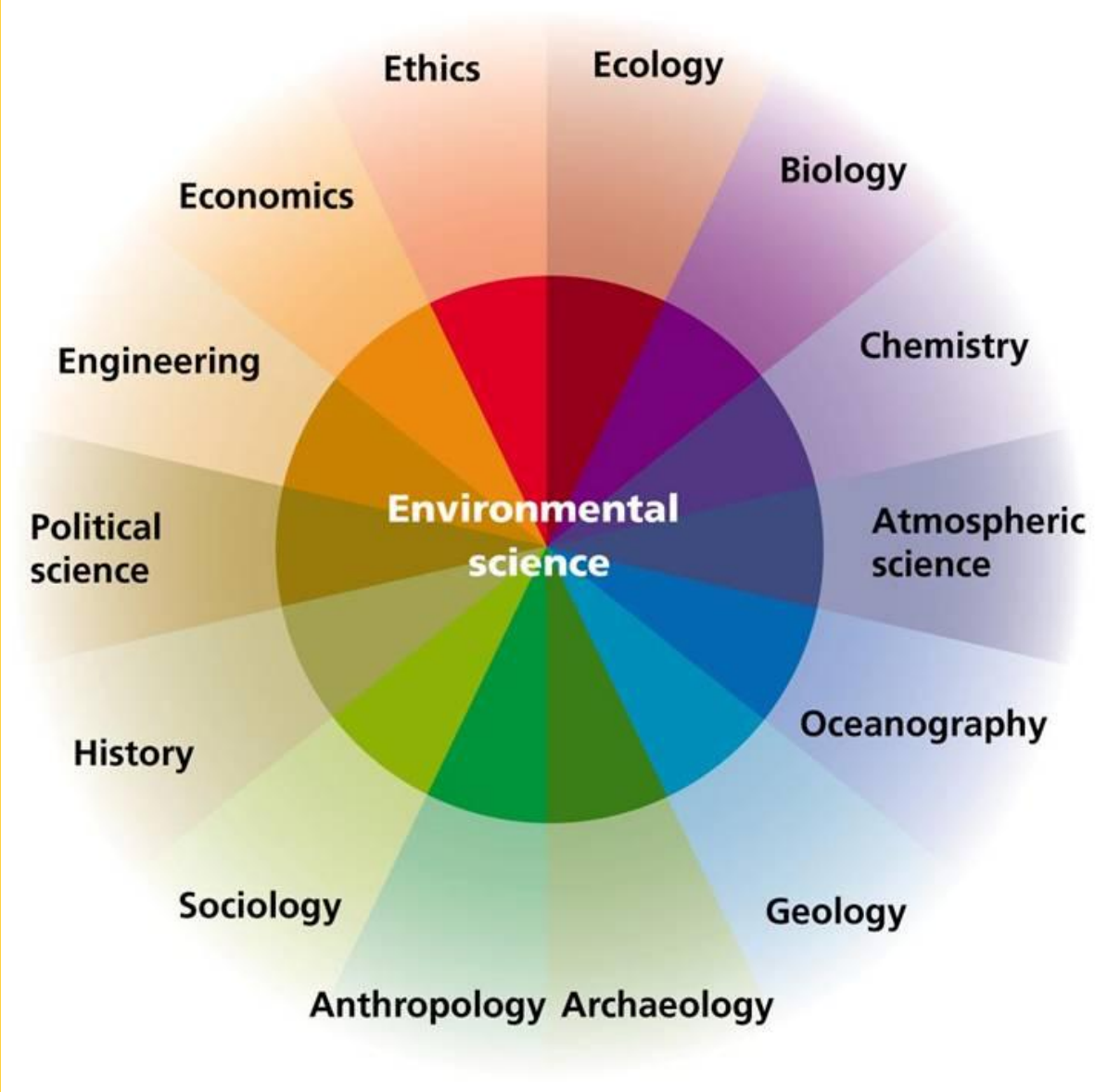
- To understand and **solve environmental problems**

- Two types of interactions between humans and the environment:

1. How we **use** natural resources
2. How our actions **alter the environment**

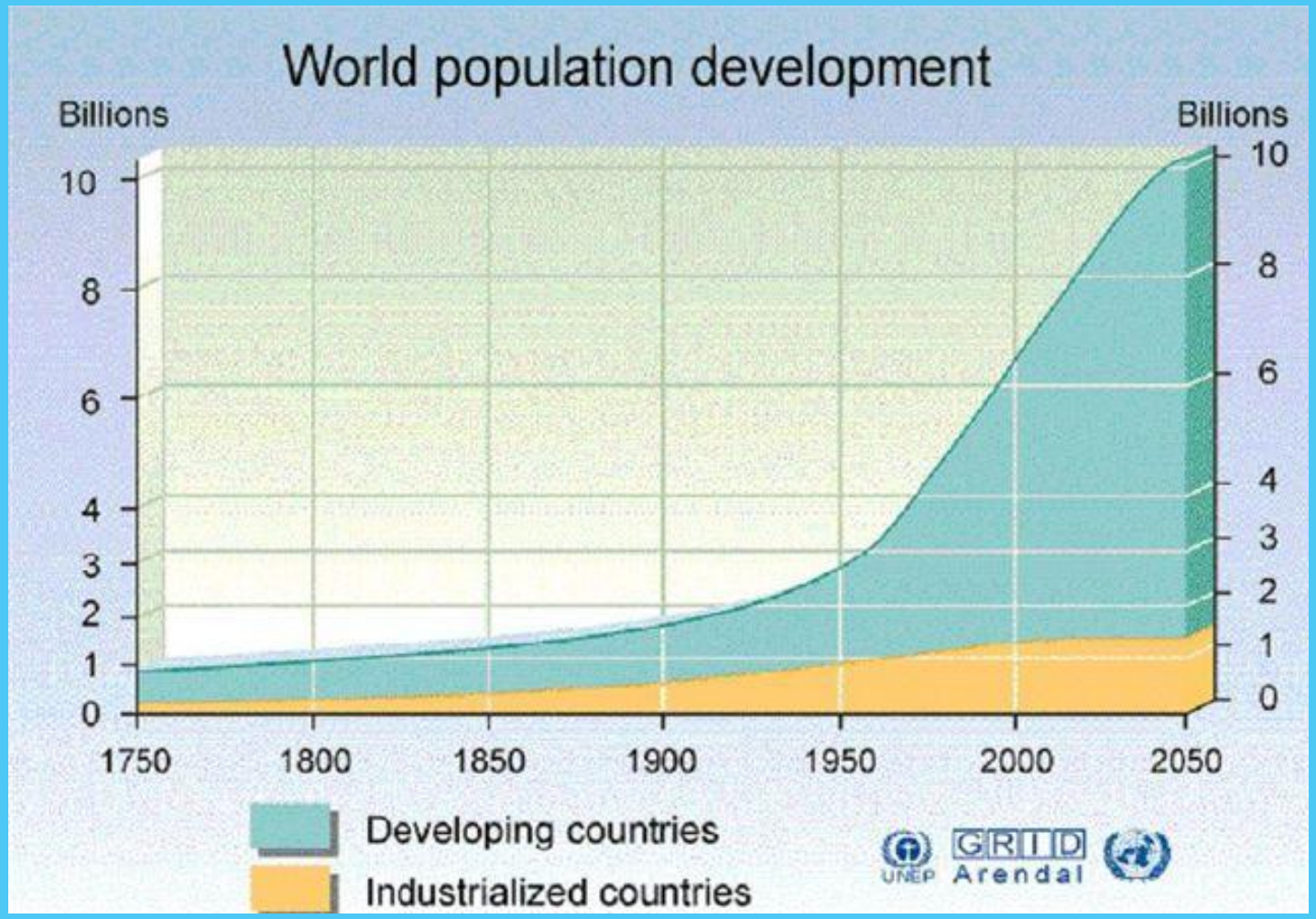
- **Multiple Sciences**
  - **Ecology** – the study of how living things interact with each other and with their environment

- Ex: Biology, Earth Science, Physics, Chemistry, **Political science, Law**, Economics, etc…



People & the Environment

Our **actions** produce **changes** in all of the parts of the Earth System.



1. **Resource Depletion**

Renewable Resources: **Can be replenished** over a short period of time

EXAMPLES:




Nonrenewable Resources: May take **millions of years to replenish**

EXAMPLES:



2. **Pollution** – undesired change in air, water, or soil that adversely affects the health, survival, or activities of humans or other organisms

3.Loss of Biodiversity – the number and variety of species that live in an area

Earth System Science

System – any size group of **interacting parts** that form a complex whole.

Types of Systems

- Two types of systems:

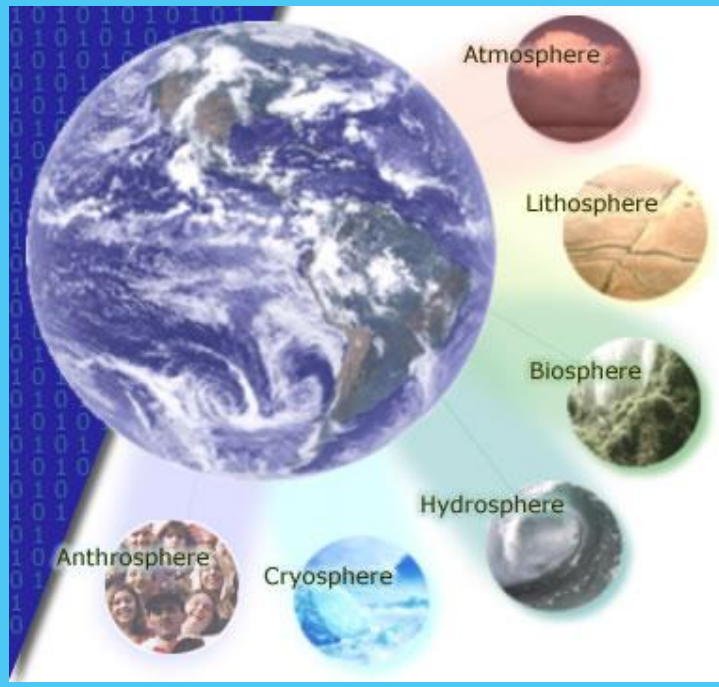
1. **Closed** – self contained

   (EX: car's cooling system)

2. **Open-** energy and matter to flow in and out

(EX: most natural systems)

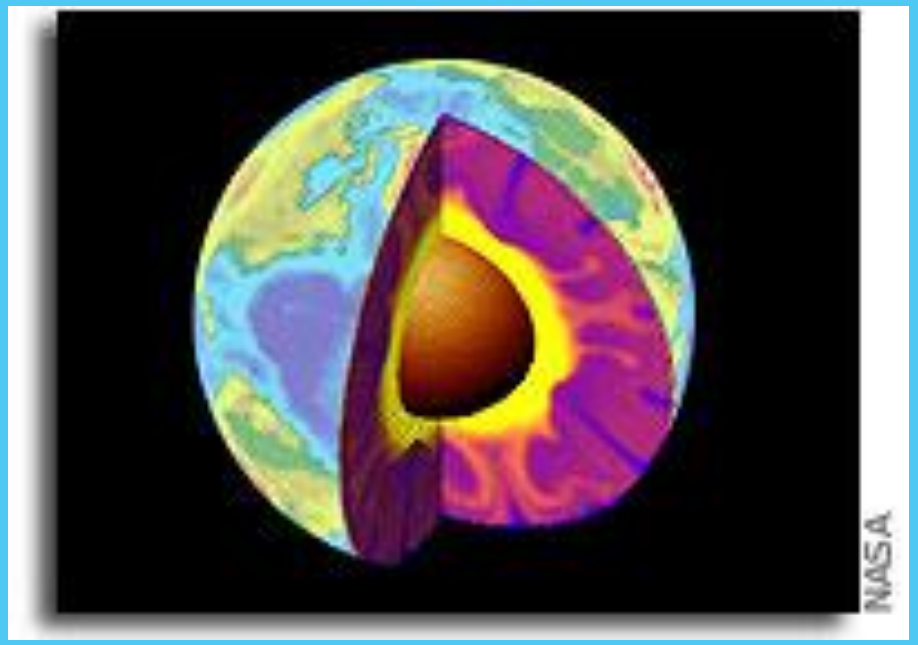
Is Earth open or closed?



Earth as a system

All systems must have an energy source

1. The Sun



2. Earth's Core