

Unit Outline

In this unit there are 3 main concepts we will learn

1. Climate regions of the world and Canada
 - Lesson 1: The Biosphere
 - Lesson 2: Biomes of the World/Canada and Adaptations
 - Lesson 3: Climatographs
 - Quiz on Lessons 1-3

2. Explaining Climate
 - Lesson 4: Energy From the Sun
 - Lesson 5: Factors affecting precipitation and temperature

3. Climate Change
 - Lesson 6 - Net radiation budget and the Natural Greenhouse Effect
 - Lesson 7 - Enhanced Greenhouse Effect and Climate Change
 - Quiz on Lessons 4-7

How is climate different from weather?

Weather deals with temperature, precipitation, air pressure at a particular time and place.

- A blizzard or thunderstorm are examples of weather

Climate is the average weather in a location over a long period of time.

- Climate is used in weather forecasting

Weather

http://weather.gc.ca/city/pages/ab-10_metric_e.html

Climate

http://climate.weather.gc.ca/climate_normals/results_e.html?stnID=2467&lang=e&dCode=1&dispBack=1

Lesson 1 - The Biosphere

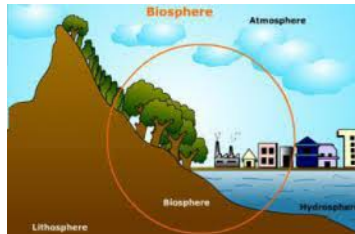
- Define '**Biosphere**'

A thin layer of Earth capable of supporting life

- The biosphere is composed of all **living things** and the **physical** environment that supports them.

- The three interacting components that make up the biosphere are:

- a. **Atmosphere - air**
- b. **lithosphere - land**
- c. **Hydrosphere - water**



Atmosphere:

- The atmosphere rises up over **500** km from the surface of the earth.

- The atmosphere is made up of a mixture of gases. Fill in the following table.

Constituent	Percent by Volume	Concentration in Parts Per Million (PPM)
Nitrogen (N ₂)	78.054	780,540.0
Oxygen (O ₂)	20.946	209,460.0
Argon (Ar)	0.934	934.0
Carbon dioxide (CO ₂)	0.036	360.0
Neon (Ne)	0.00182	18.2
Helium (He)	0.000524	5.24
Methane (CH ₄)	0.00015	1.5
Krypton (Kr)	0.000114	1.14
Hydrogen (H ₂)	0.00005	0.5

- What can be included as parts of the atmospheric dust that is also part of our atmosphere?

Soot (carbon), pollen, micro-organisms (bacteria, viruses)

- The most abundant gas in the atmosphere is **nitrogen**. How is this gas used by living things?

- o **Used by plants in their growth.**

- **Oxygen** is the 2nd most abundant gas in the atmosphere. How is this gas used in the biosphere by living things?

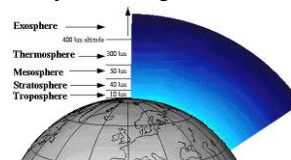
- o **Plant make it in the process of photosynthesis**
- o **All living organisms require it for life**

- How are levels of oxygen replenished in the atmosphere?

- o **Plants make oxygen in photosynthesis**

- Earth's atmosphere can be divided into 4 layers which are determined by the average **air temperature**. The four layers starting with the closest to earth are:

- a. troposphere
- b. stratosphere
- c. mesosphere
- d. thermosphere



- The **troposphere** is the layer of atmospheric gases at 0 km to 10 km from Earth's surface.

- a. It contains about **80%** of the atmospheric gases by mass.
- b. The layer where most **weather** occurs.

- The **stratosphere** contains most of the ozone gas in the atmosphere.

- a. The **ozone layer** protects living things from damaging high energy radiation.

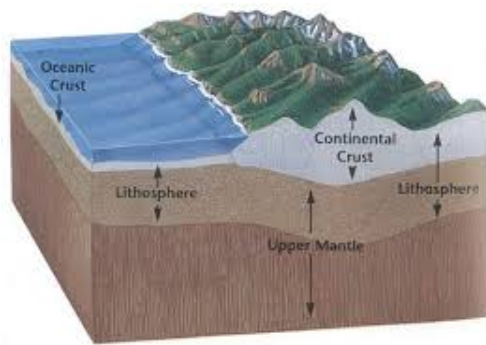
https://www.youtube.com/watch?v=Nqv-0qd7sBg&index=41&list=PLMrtJn-MOYmfqNgyPxx6NYMZnd25y4shc&src_vid=cimglhtN-AU&feature=iv&annotation_id=annotation_309425



Lithosphere

- The **lithosphere** is the solid portion of the Earth that floats above the semi fluid mantle of the upper mantle

- It extends from earth's surface to about **100 km** below and runs under Earth's continents and **oceans**.
- How is the lithosphere warmed? (2 ways)
 - Sun
 - molten material in the earth's core



Hydrosphere:

- The hydrosphere accounts for all **water (ice, liquid, vapour)** on Earth.

- About **97%** of water on earth is salt water.
- The amount of water on earth always **stays the same**

- Water moves through the hydrosphere in the **water cycle**

<https://www.youtube.com/watch?v=oaDkph9yQBs>

