Formation of Earth: Atmosphere

EQ: Explain how Earth's atmosphere formed and changed.

Atmosphere:
The gas envelope that extends from the ocean, land, and ice-covered surface of a planet outward into space.

The density of the atmosphere decreases outward, because the gravitational attraction of the planet, which pulls the gases and particle inward, is greatest close to the surface.

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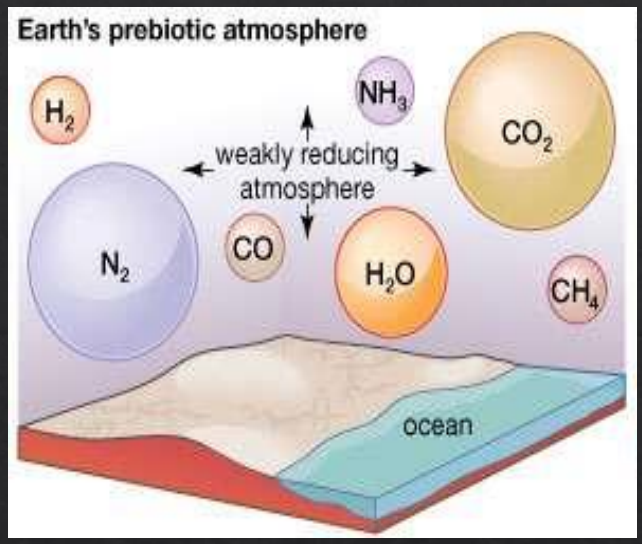
Primordial Atmosphere:



Developed by venting during the original formation of the planet:

- Water vapor (H_2O)
- Carbon dioxide (CO_2)
- Hydrogen (H_2)
- Carbon monoxide (CO)
- Nitrogen (N_2)
- Ammonia (NH_3)
- Methane (CH_4)
- Traces of other substances.

Approximately 85% of volcanic emissions are in the form of water vapor.
(In contrast, carbon dioxide is about 10%)

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- Earliest organisms on Earth were cyanobacteria
  - These organisms conducted photosynthesis
- Population of bacteria increased → oxygen in the atmosphere increased
- At first, oxygen didn't accumulate in the atmosphere
  - Oxygen will bond to other elements if they are available
  - Other elements to bond to had to be exhausted first

- 2.5 billion years ago – little oxygen. 1% of atmosphere
- 2 billion years ago – concentration begins to increase
- 700 million years ago – concentration increased 20%

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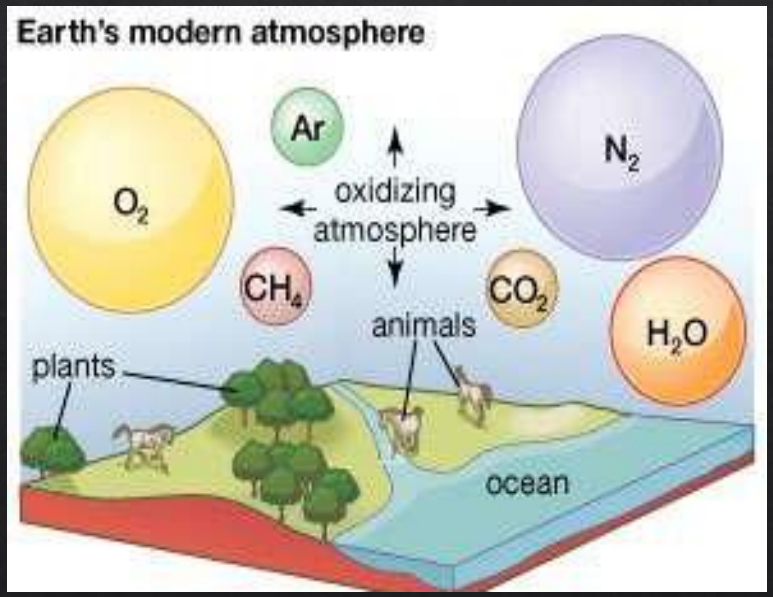
Current Atmosphere:

Once organisms developed the capability for photosynthesis, oxygen was produced in large quantities creating the ozone layer.

- Nitrogen (N_2), 78%
- Oxygen (O_2), 21%
- Argon (A), 1%
- Water (H_20), ~0- 4%
- Carbon dioxide (CO_2), 0.04%
- Methane (CH_4) and other trace elements



Photosynthesis arose about 2 billion years ago.
Previously oxygen was produced in limited quantities

Formation of Earth: Atmosphere

Combine the information from both pictures into one picture:

Draw, Color, & Label

Include:
- The layers
- Distance
- Ozone
- Images in each layer