SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore – 35

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Approved by AICTE , New Delhi and Affiliated to Anna University , Chennai.

DEPARTMENT OF AGRICULTURAL ENGINEERING

19AGE401 – CLIMATE CHANGE AND ADAPTATION

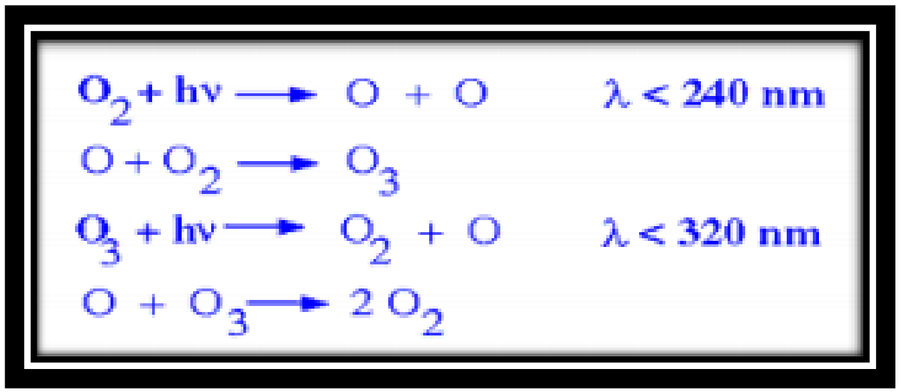
IV – YEAR VII SEMESTER

UNIT 1 – EARTH'S CLIMATE SYSTEM

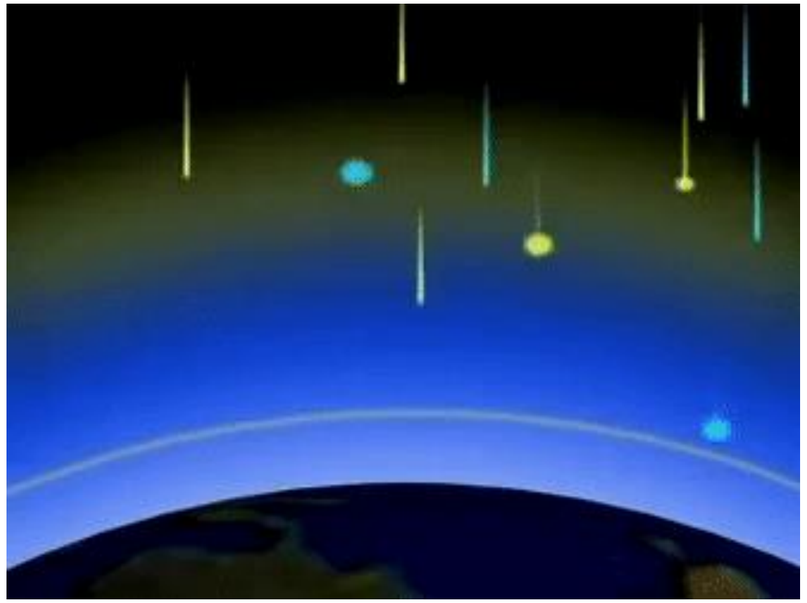
TOPIC 1 – ROLE OF OZONE IN ENVIRONMENT

Ozone

- A molecule containing three atoms of oxygen is called ozone.
- Ozone is very rare in our atmosphere, averaging about three molecules of ozone for every 10 million air molecules.
- Ozone plays a vital role in the atmosphere.
- It shields the entire Earth from much of the harmful UV radiation that comes from the sun.



Where is Ozone found ????



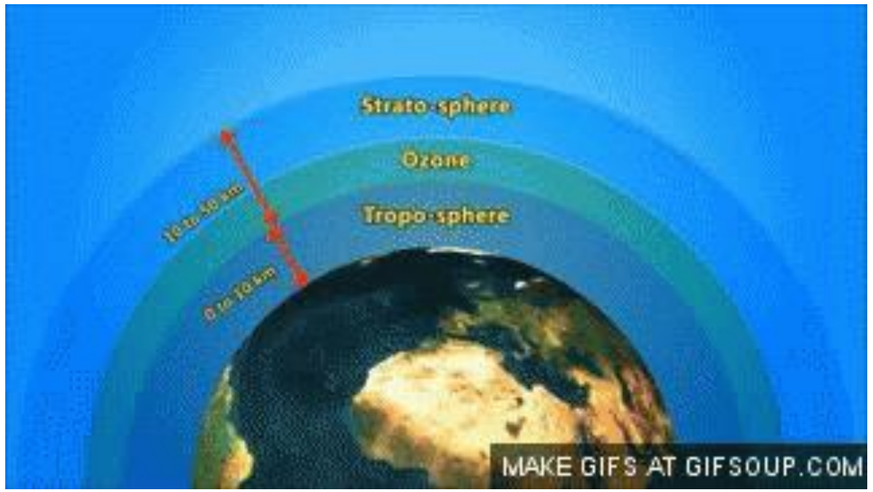
- Ozone is mainly found in two regions of the Earth's atmosphere.
- Most ozone (about 90%) resides in a layer that begins between 6 and 10 miles (10 and 17 kilometers) above the Earth's surface and extends up to about 30 miles (50 kilometers).
- This region of the atmosphere is called the stratosphere. The ozone in this region is commonly known as the ozone layer.
- The ozone layer is mainly found in the lower portion of the stratosphere.

Where is Ozone found ????

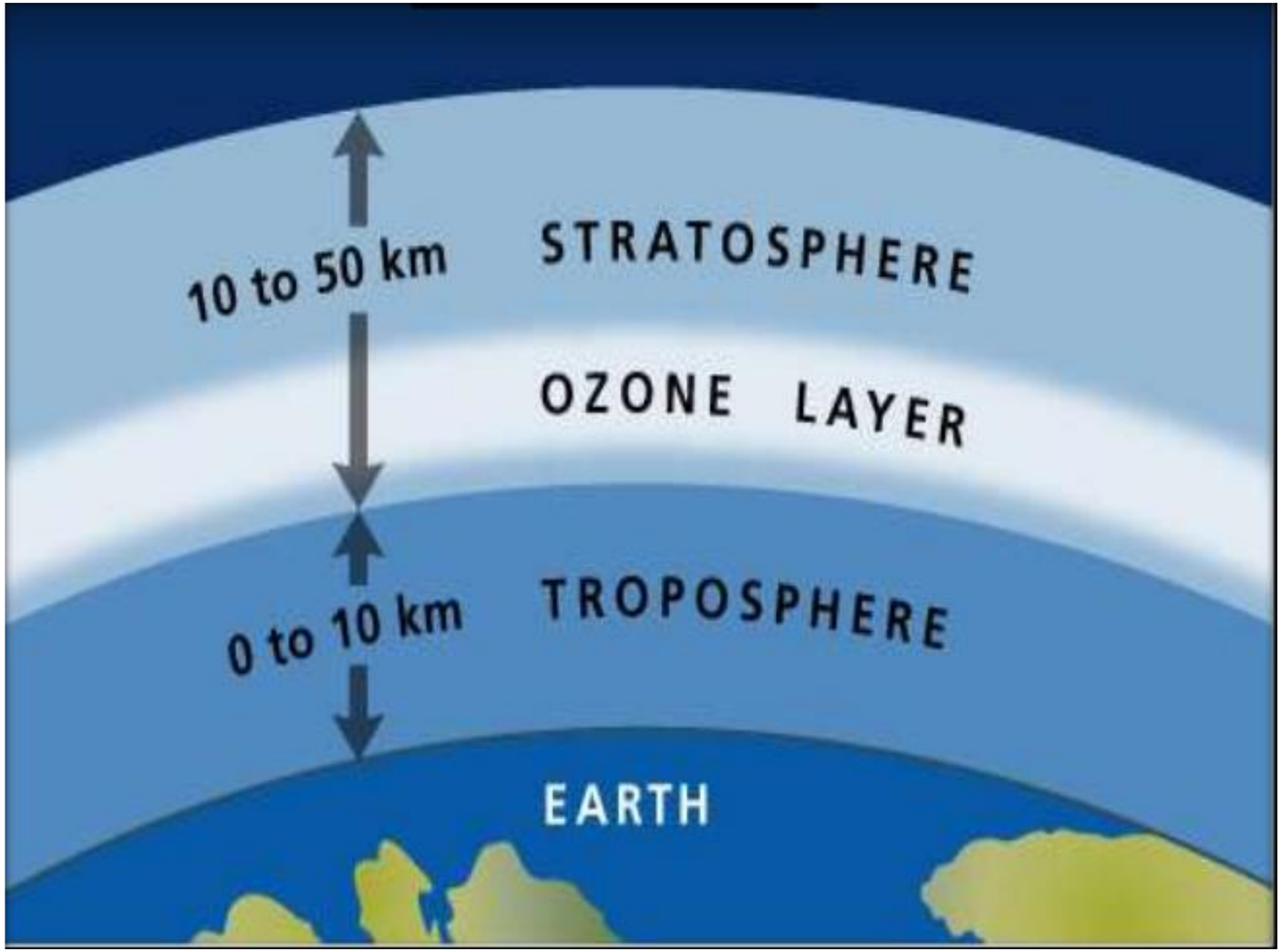
- It contains high concentrations of ozone(O3) relative to other parts of the atmosphere.
- The ozone layer was discovered in 1913 by the French physicists Charles Fabry and Henri Buisson.
- The ozone layer refers to a region of Earth's stratosphere that absorbs most of the Sun's UV-radiation.

Where is Ozone found ????

- The earth's atmosphere is divided into several layers, and each layer plays an important role.
- The first region extending about 10km upwards from the earth's surface is called the troposphere.
- Many human activities like mountain climbing, gas balloons and smaller aircrafts operate within this region.
- The next layer, extending about 10-50 km is called the stratosphere .where the ozone layer (lower portion)found, though the thickness varies seasonally and geographically.



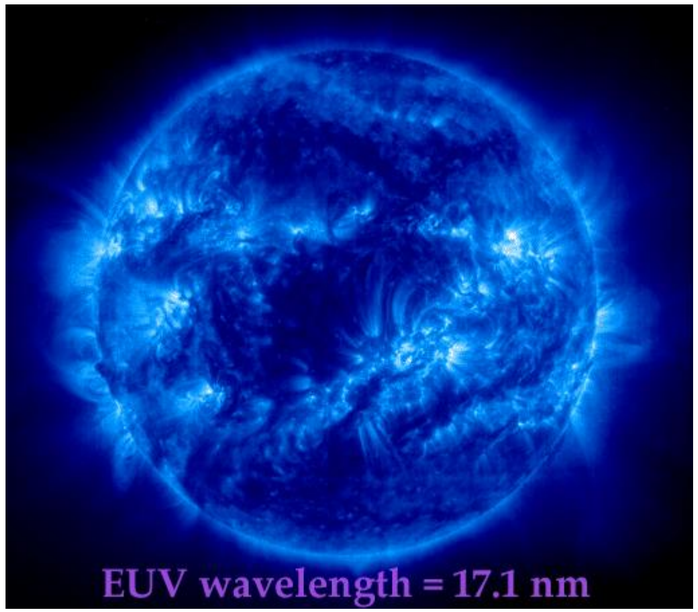
Where is Ozone found ????



UV- radiation

- Ultraviolet (UV) light is an electro magnetic radiation with a wavelength from 400 nm to 100
- UV are of 3 types UVA,UVB,UVC.
- UVA is not harmful as UVB (315-400nm),UVB decreases atmospheric ozone cause biological damages(280-315nm),UVC get absorbed by ozone(200-280nm)

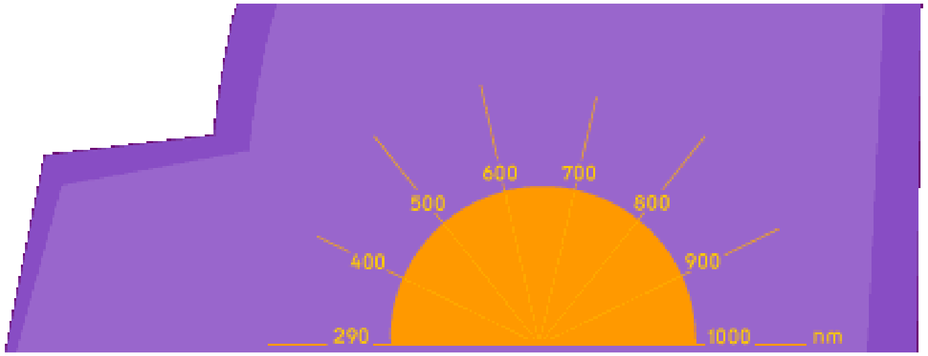
Role of Ozone layer!!!



- The absorption of ultraviolet radiation by ozone creates a source of heat.
- Ozone thus plays a key role in the temperature structure of the Earth's atmosphere.
- Without the filtering action of the ozone layer, more of the Sun's UV radiation would penetrate the atmosphere and would reach the Earth's surface.
- The harmful effects of excessive exposure to UV radiation .It causes harmful effect to crop, forest growth and human health.

How are humans affected by it??

- Some parts of Antarctica, up to 60% of the total overhead amount of ozone (known as the column ozone) is depleted during Antarctic spring (September- November).
- This phenomenon is known as the Antarctic ozone hole.
- In the Arctic polar regions, similar processes occur that have also led to the depletion of column ozone.



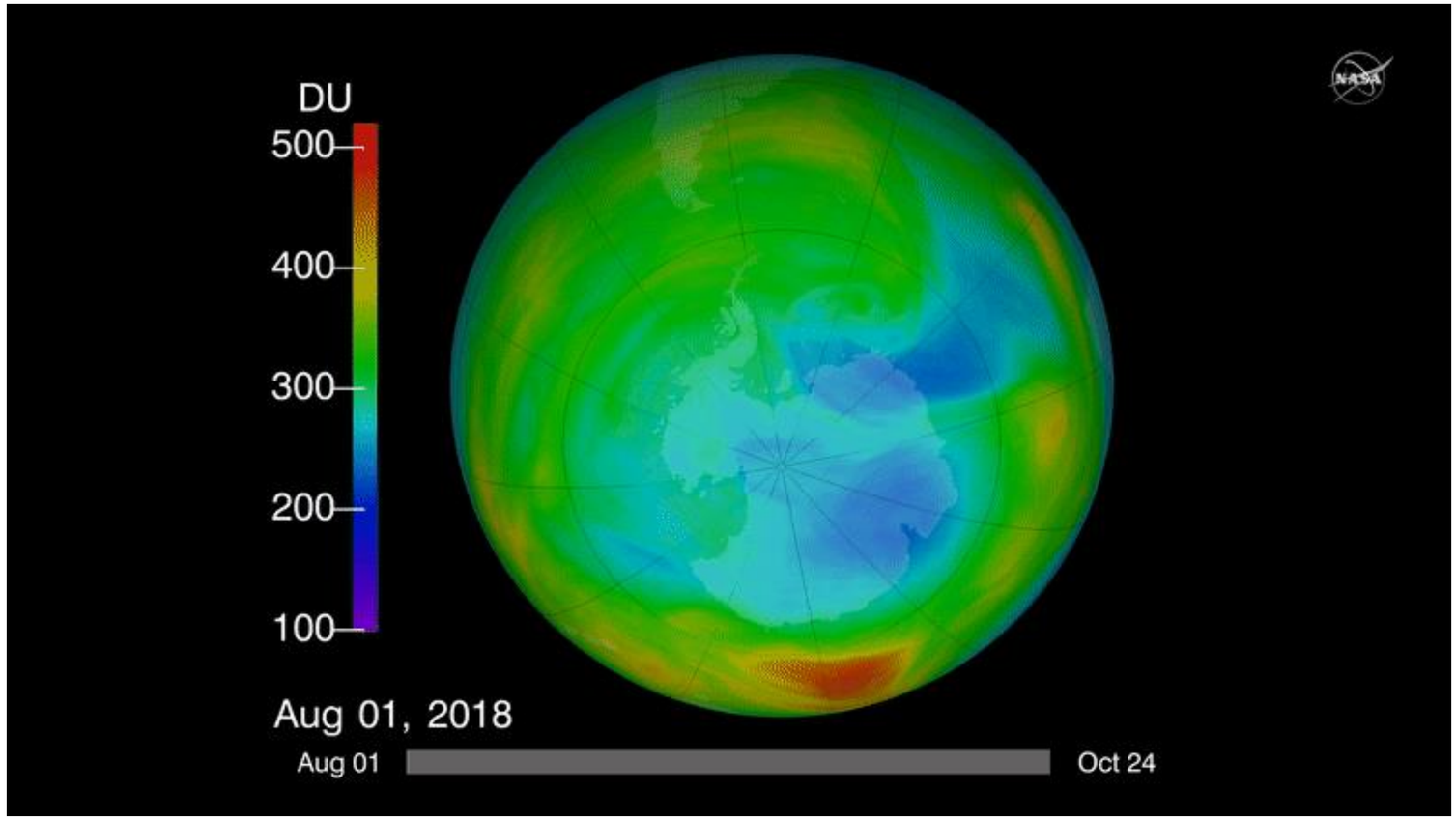
Assessment

- **Why there is a change in climate**
- **How human activities impact the climate**

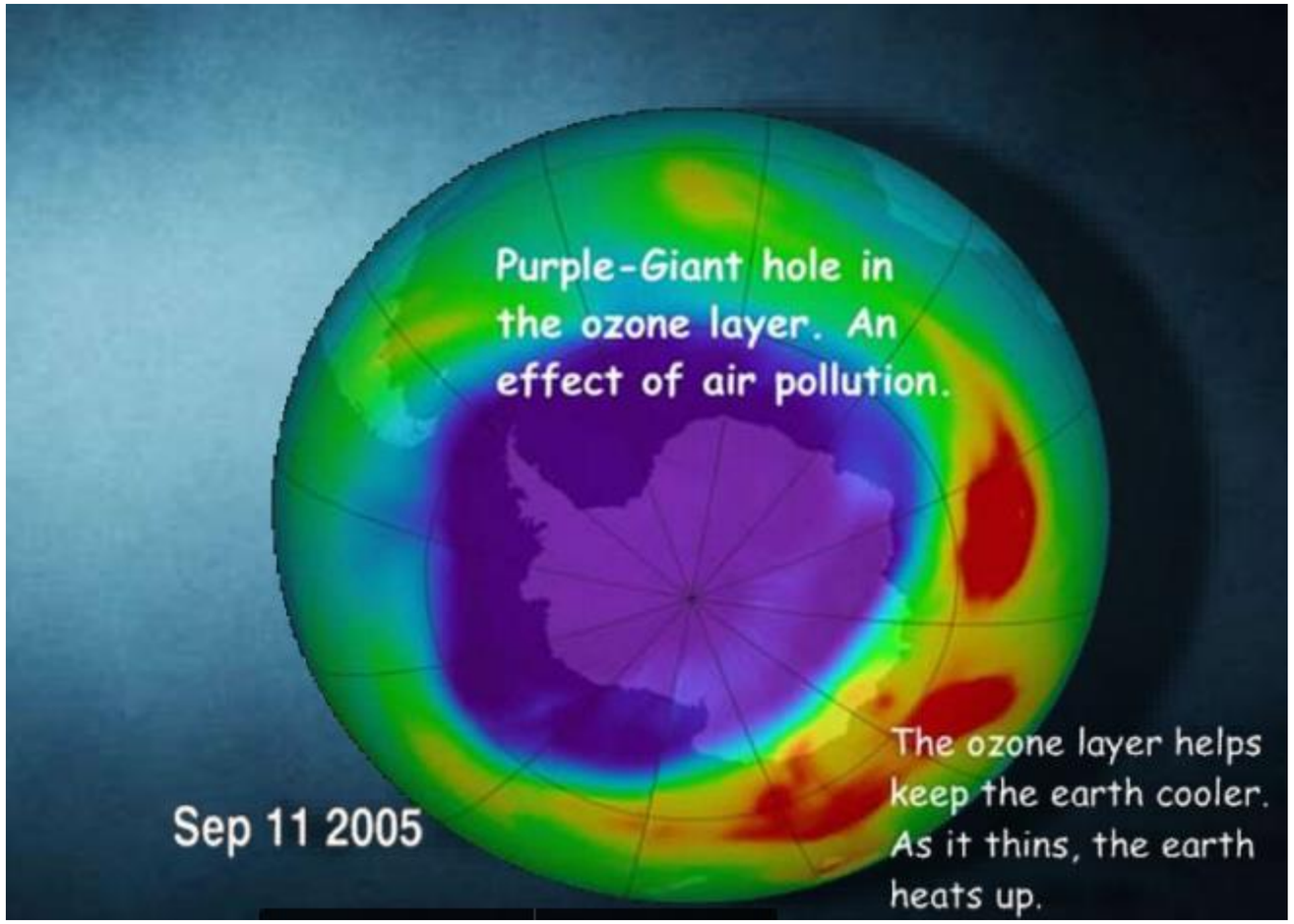
Ozone Hole!!!

- The term "ozone depletion" means more than just the natural destruction of ozone Damage in the ozone layer will naturally mean the entry of harmful rays in to the atmosphere.
- Or Decrease in stratospheric ozone around earth’s polar region this phenomena is referred as ozone hole.

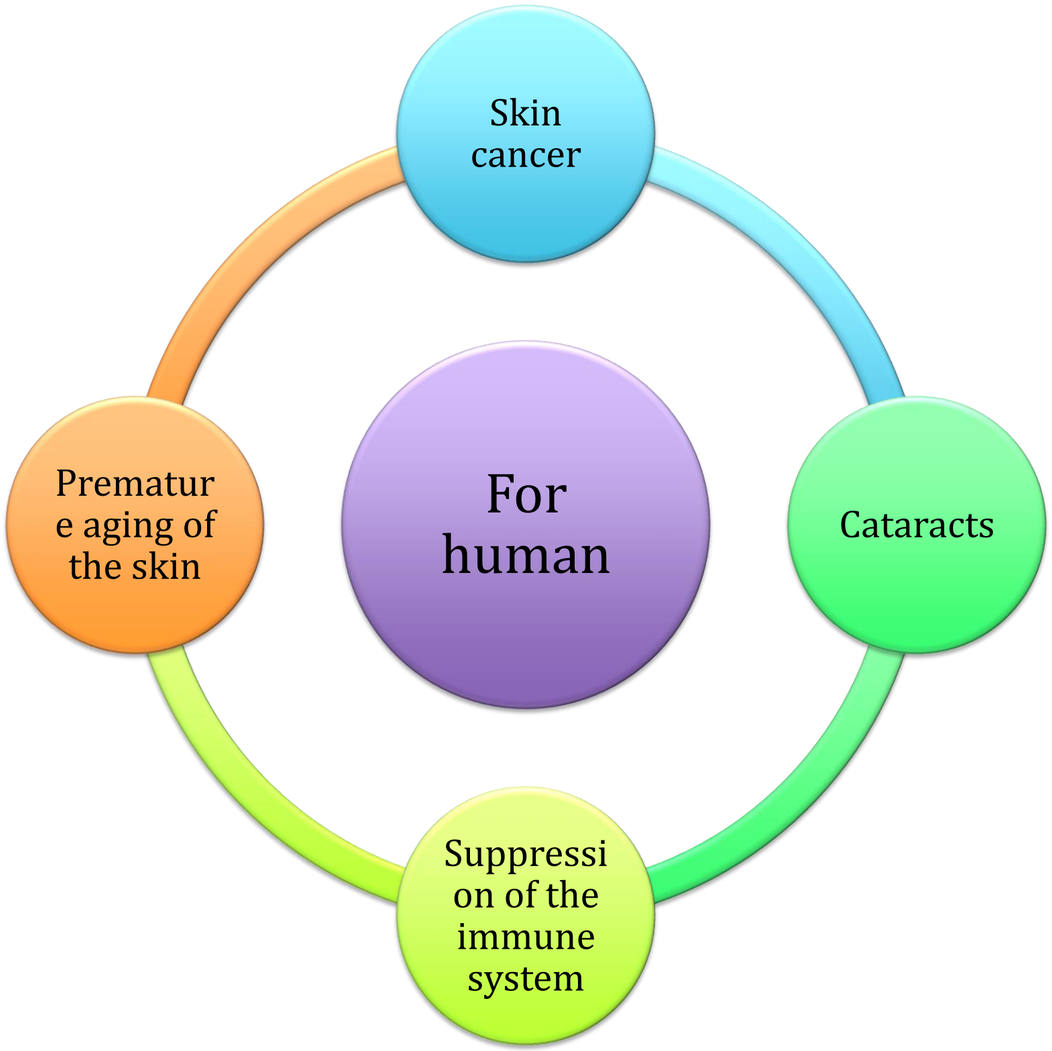
Antarctic Ozone Hole



Ozone Hole!!!


Purple-Giant hole in the ozone layer. An effect of air pollution.
Sep 11 2005
The ozone layer helps keep the earth cooler. As it thins, the earth heats up.

Human Effects

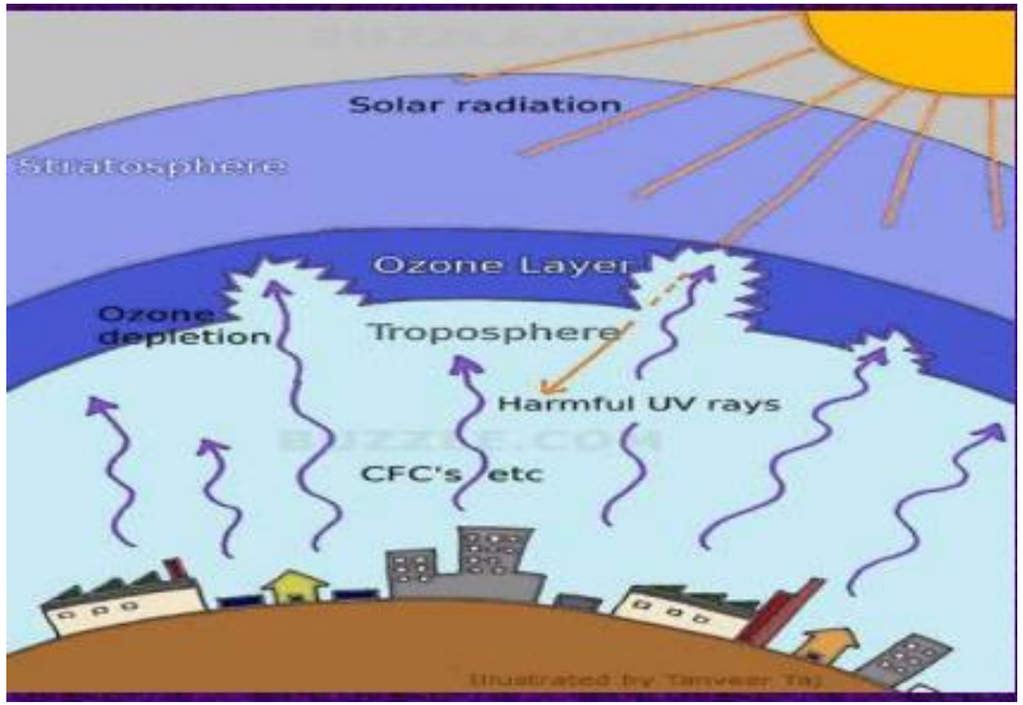


Effects on the Environment

- Global Warming
- Climate change
- Crop and forest damage
- Infection and skin disease on animals
- Less fish harvest

Causes of Ozone Hole!!!

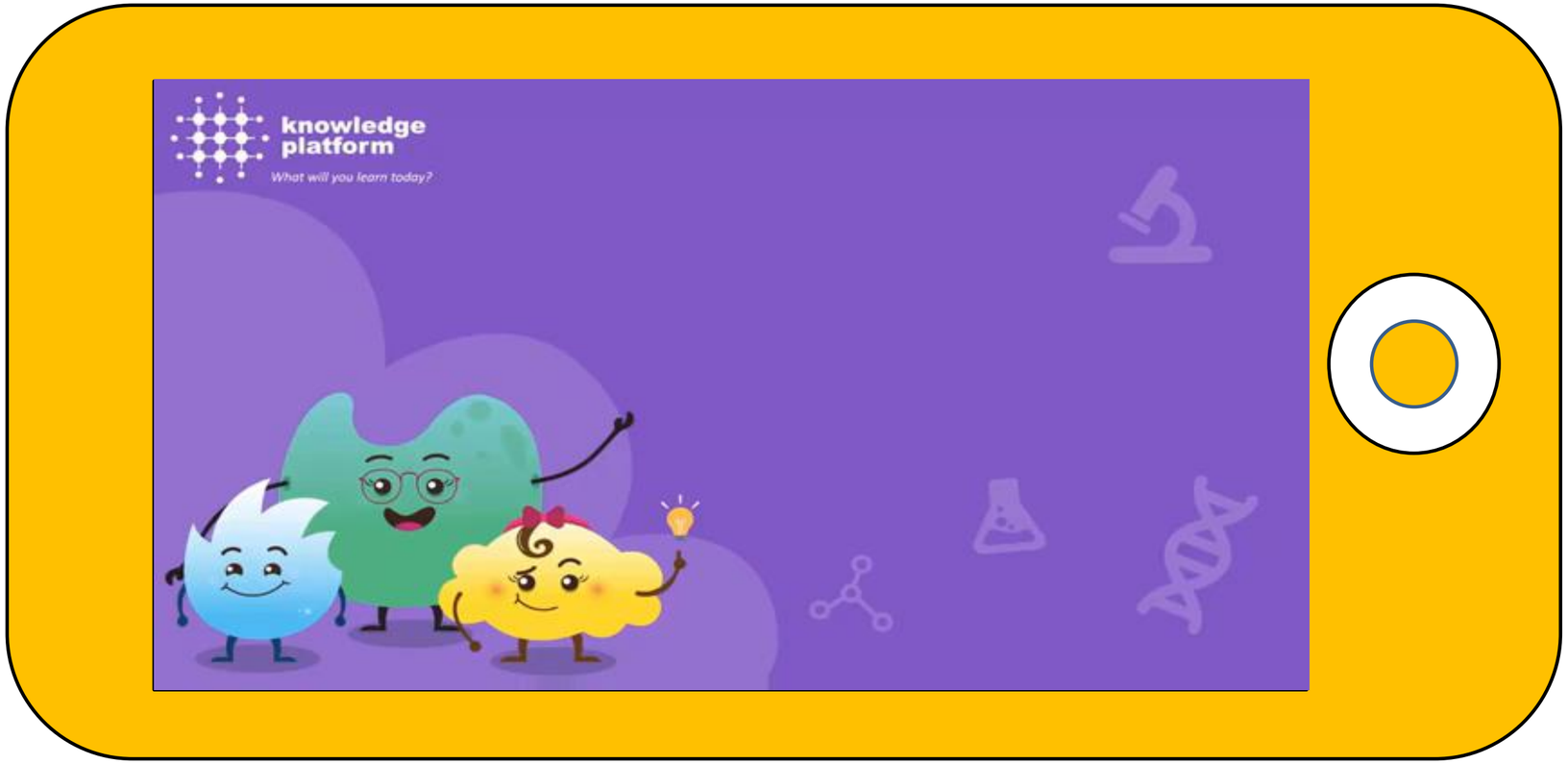
The primary cause of ozone depletion is the presence of chlorine-containing source gases (primarily CFCs and related halocarbons).



What actions taken to prevent ozone depletion

- Through an international agreement known as the Montreal Protocol on Substances that deplete the Ozone Layer, governments have decided to eventually discontinue production of CFCs, carbon tetrachloride, and methyl bromide(except for a few special uses)
- Industry has developed more "ozone-friendly“ substitutes.
- The ozone depletion can also cause increase in global warming and green house effect

Reference Videos



See You at Next Class!!!!