ENVIRONMENTAL STUDIES

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MODULE -1 SYLLABUS

- **Unit 1: Introduction to Environmental studies**

  Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere.

- Scope and importance; Concept of sustainability and sustainable development.

What is Environmental science ?

- It is a study of every aspect of all living organisms on the earth.
- It deals from birth to death of all living organisms and their interrelationship.
- It is multi disciplinary- as it deals with science, physics, chemistry, astronomy, mathematics etc.

Why its important ?

- Because we all human beings & all other animals, birds, plants, trees, fishes etc share this earth for living. The resources and place is limited and all need to survive for future generations!! So preserving the environment is important.

HYDROSPHERE

- ALL WATER BODIES- FRESH WATER/ SALT WATER

- SEAS
- OCEANS
- ESTUARIES, BACK WATERS, MANGROVE
- RIVERS, PONDS,LAKES

BIOSPHERE

- Thin layer above earth surface where all living beings exist.
- ANIMALS, PLANTS, HUMAN BEINGS, BIRDS etc.
- Need Oxygen, Co2, sunlight and temperature for living

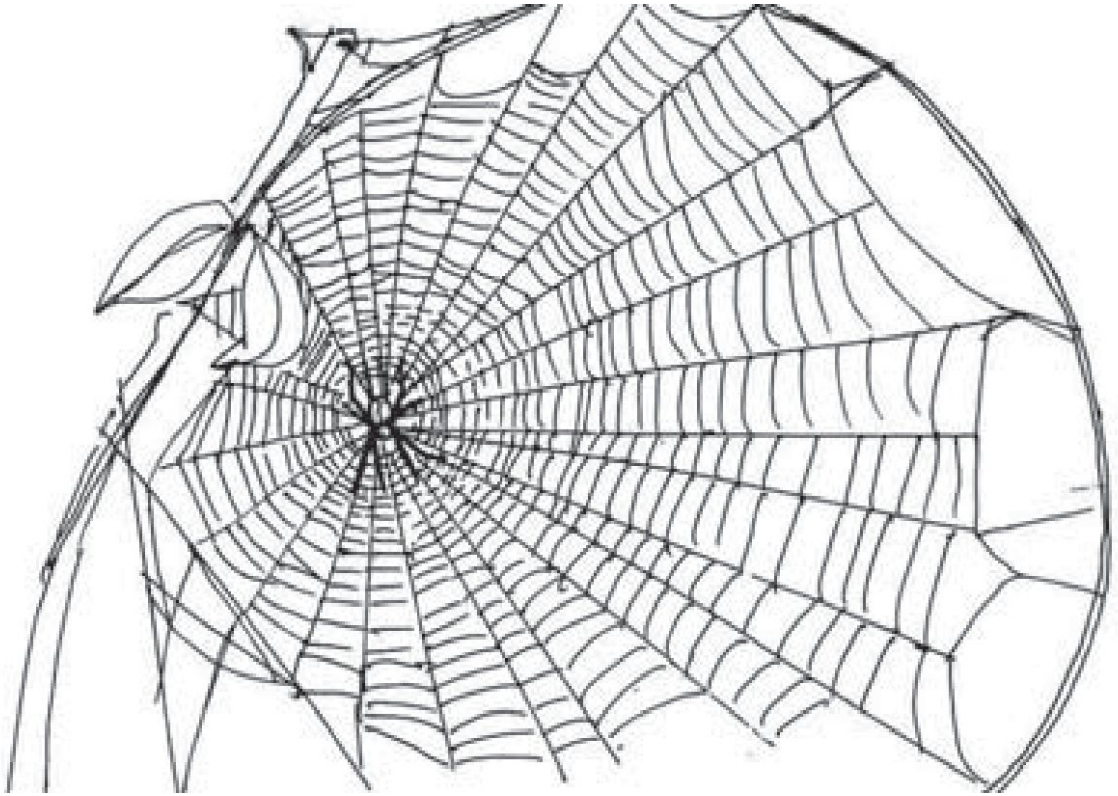
IMPORTANT TERMS

- **Ecological Niche-** It is the role that an animal or plant species plays in the environment, the status of an organism within its environment, which affects its survival. Two species can occupy the same habitat in a community but cannot occupy the same niche for a long time as it would result in competition and survival of the fittest.
- **Biome**- A large regional unit characterized by distinctive plant and animal species and with similar climatic conditions over the whole region, especially such a community that has developed to climax. E.g. desert, tropical rain forest etc.
- **Biosphere**- Part of the Earth's surface and atmosphere that contains the entire terrestrial ecosystem, and extends from ocean depths to about six kilometers above sea level which contains all living organisms and what supports them, the soil, subsurface water, bodies of water, air and includes hydrosphere and lithosphere. It is also called ecosphere.

LITHOSPHERE

- About 6-8 kms below earth crust called mantle.
- Contains 93 elements
- 47% is oxygen, 28% is silicon, 8% is aluminium, and 5% is iron, while sodium, magnesium, potassium and calcium constitute 4% each.
- Rocks, minerals, oil, gas, precious metals gold, silver, aluminium, steel, mica, magnesium, coal, marble, granite

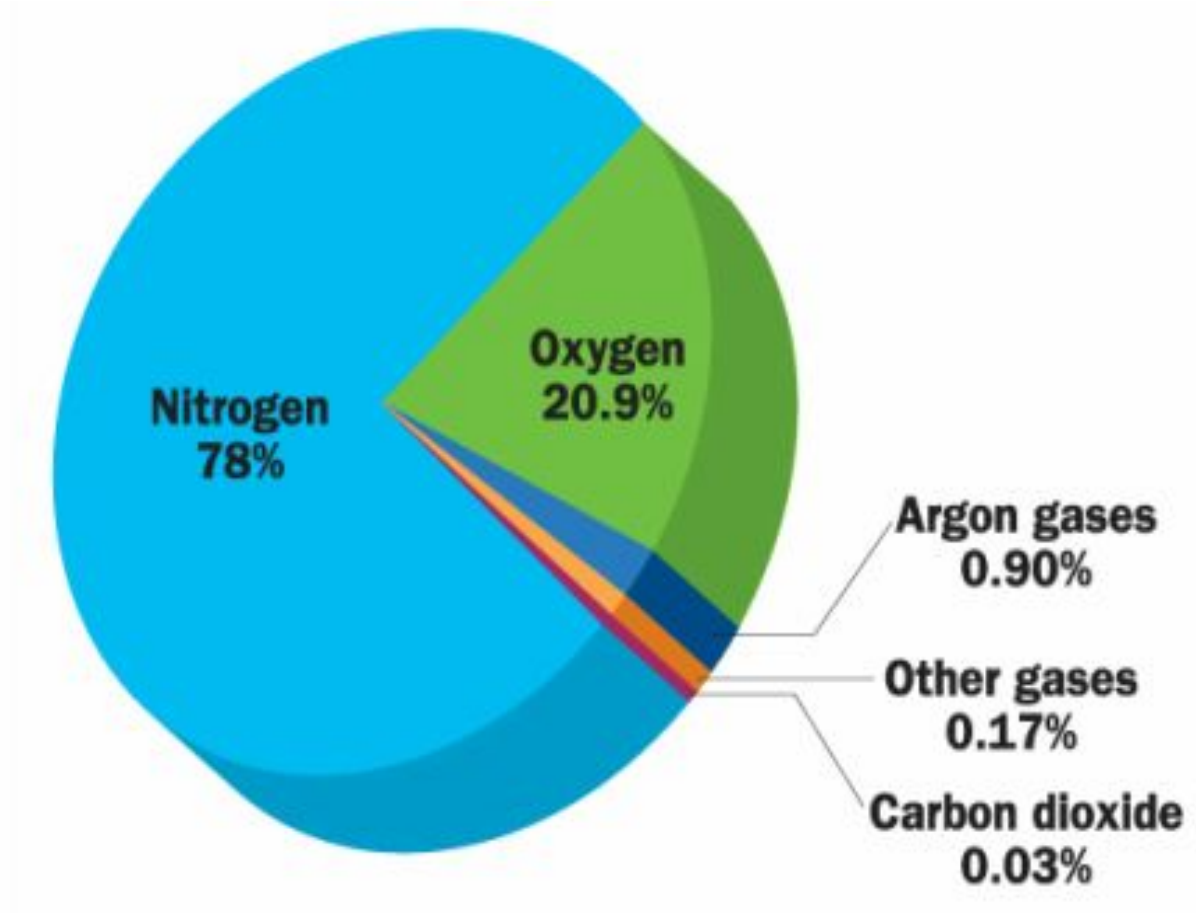
EVERYTHING IS INTERDEPENDENT



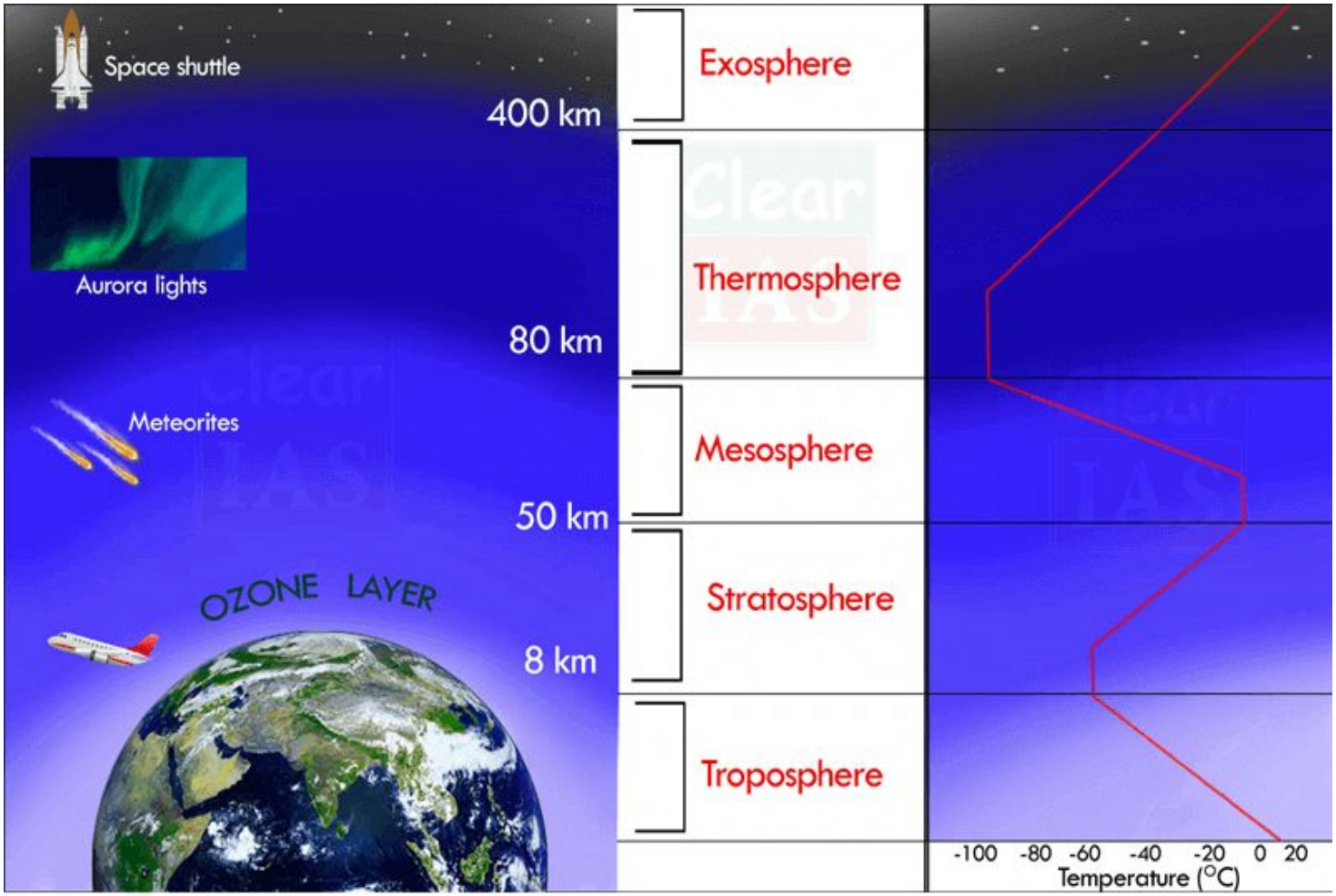
IMPORTANCE

- WE CANNOT INCREASE THE EARTH SURFACE
- RESOURCES ARE LIMITED
- UTILIZATION HAS TO BE MINIMIZED
- INDUSTRIAL WASTE CREATE HEALTH HAZARDS

ATMOSPHERE GASES



ATMOSPHERE LAYERS



ATMOSPHERIC LAYERS

- **TROPOSPHERE.** Earth's troposphere extends from Earth's surface to, on average, about 12 kilometers (7.5 miles) in height, with its height lower at Earth's poles and higher at the equator. Yet this very shallow layer is tasked with holding all the air plants need for photosynthesis and animals need to breathe, and also contains about 99 percent of all water vapor and aerosols

- **STRATOSPHERE** : Located between approximately 12 and 50 kilometers (7.5 and 31 miles) above Earth's surface, the stratosphere is perhaps best known as home to Earth's ozone layer, which protects us from the Sun's harmful ultraviolet radiation. Because of that UV radiation, the higher up you go into the stratosphere, the warmer temperatures become.
- **Mesosphere.** Located between about 50 and 80 kilometers (31 and 50 miles) above Earth's surface, the mesosphere gets progressively colder with altitude. In fact, the top of this layer is the coldest place found within the Earth system, with an average temperature of about minus 85 degrees Celsius (minus 120 degrees Fahrenheit).

ATMOSPHERIC LAYERS

- **Thermosphere.** Located between about 80 and 700 kilometers (50 and 440 miles) above Earth's surface is the thermosphere, whose lowest part contains the ionosphere. In this layer, temperatures increase with altitude due to the very low density of molecules found here. It is both cloud- and water vapor-free. The International Space Station orbits in the thermosphere.
- **Exosphere.** Located between about 700 and 10,000 kilometers (440 and 6,200 miles) above Earth's surface, the exosphere is the highest layer of Earth's atmosphere and, at its top, merges with the solar wind. Molecules found here are of extremely low density, so this layer doesn't behave like a gas, and particles here escape into space. While there's no weather at all in the exosphere, the aurora borealis and aurora australis are sometimes seen in its lowest part. Most Earth satellites orbit in the exosphere.

CONCEPT OF SUSTAINABLE DEVELOPMENT

- Sustainable Development stands for sustainability and it represents an approach to development which is concerned with such fundamental human concerns like poverty, environment, equality, democracy, development and peace.
- • The term 'Sustainable Development was coined by Barbara Ward', the founder of the International Institute for Environment and Development, who made the point that development and environment protection must be linked.
- The Sustainable Development was popularized in 1987 by the World Commission on Environment and Development through the Brundtland Report.
- UNESCO has published 17 Sustainable development goals to the world to be achieved by 2030.
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