THE GLOBAL CARBON CYCLE

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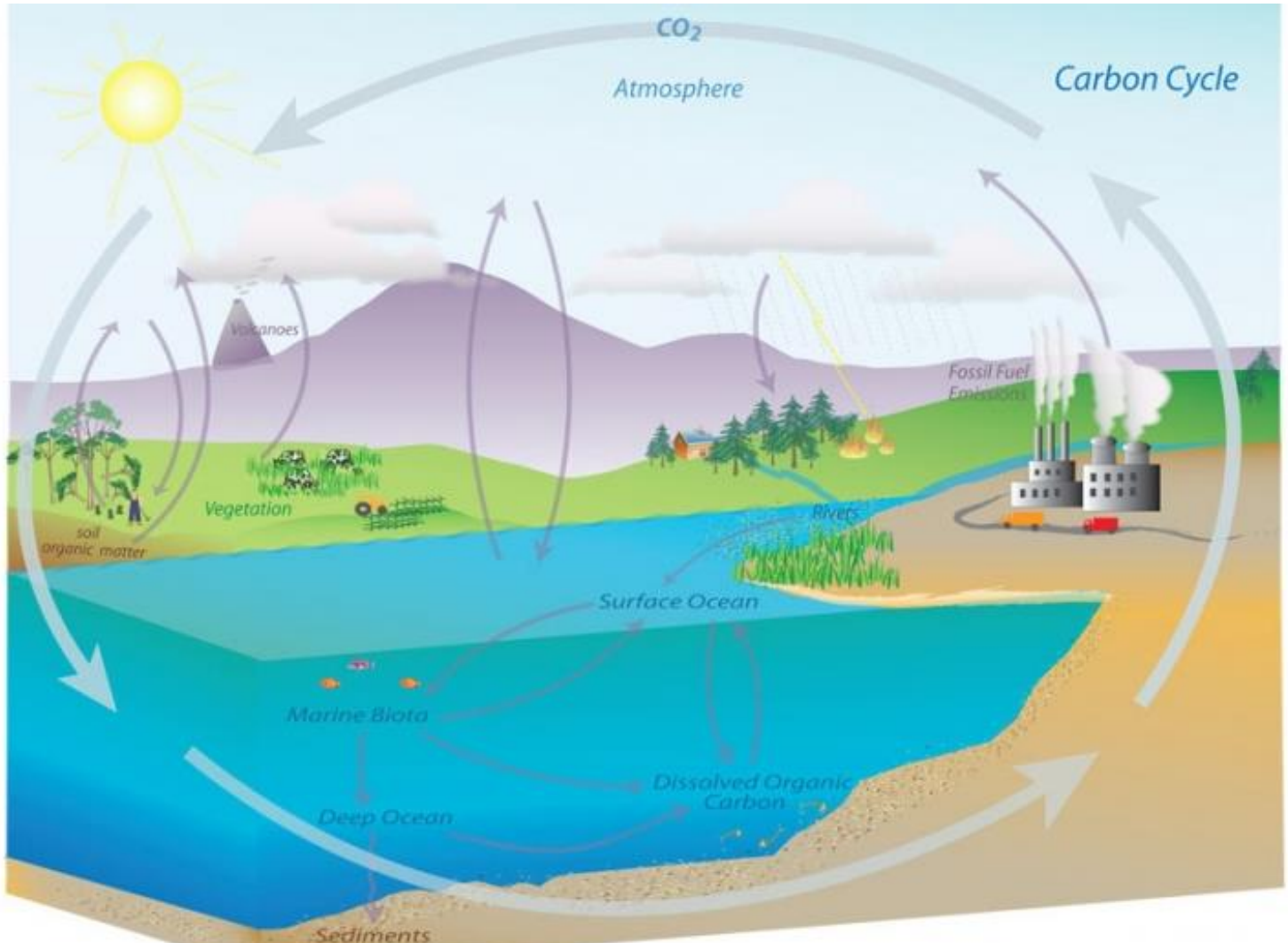
CONTENTS

What is the global carbon cycle ?

- **The Exchange of Carbon on Earth. Carbon in various forms, moves between the Earth's biosphere, hydrosphere, atmosphere, and geosphere.**



The 4 major carbon sinks

- **The main natural carbon sinks are atmosphere, plants, the ocean and soil.**

Carbon is found in atmosphere as carbon dioxide. We place CO2 in atmosphere while exhaling . Plants and animals too respire.

Carbon is also found in fossil fuels, such as petroleum (crude oil), coal, and natural gas. Carbon is also found in soil from dead and decaying animals and animal waste.

Carbon is found in the biosphere stored in plants and trees. Plants use carbon dioxide from the atmosphere to make the building blocks of food during photosynthesis.

Carbon is found in the lithosphere in the form of carbonate rocks. Carbonate rocks came from ancient marine plankton that sunk to the bottom of the ocean hundreds of millions of years ago that were then exposed to heat and pressure.

Carbon is found in the hydrosphere dissolved in ocean water and lakes. Carbon is used by many organisms to produce shells. Marine plants use carbon for photosynthesis. The organic matter that is produced becomes food in the aquatic ecosystem.

World's largest carbon sink:

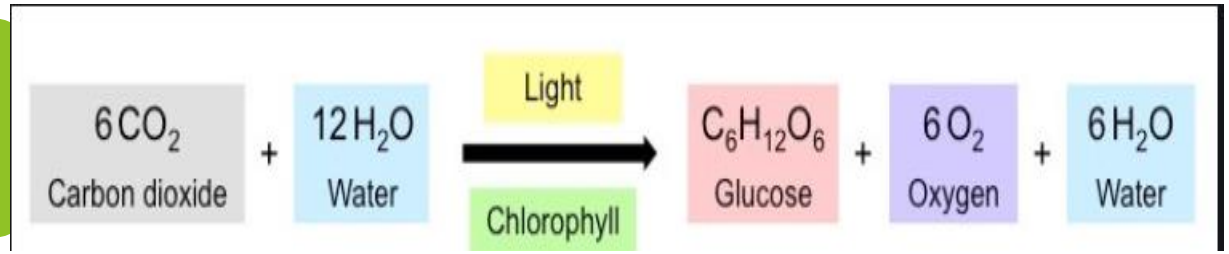
- **OCEANS**

93 % CO_2 is stored in algae, vegetation, and coral under the sea.

But oceans are not able to absorb all of the carbon dioxide released from the burning of fossil fuels.

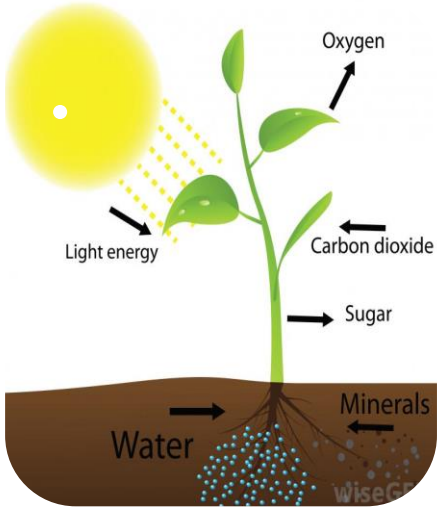
Main Processes

Photosynthesis

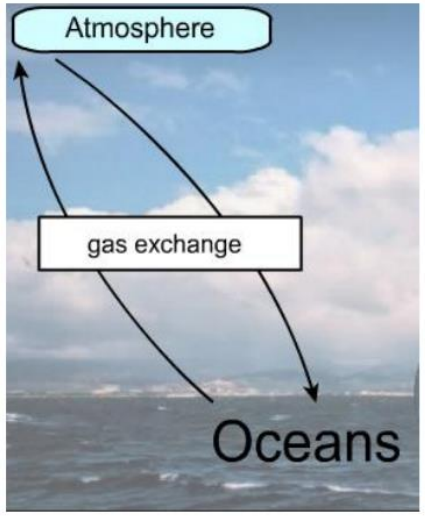


Metabolism

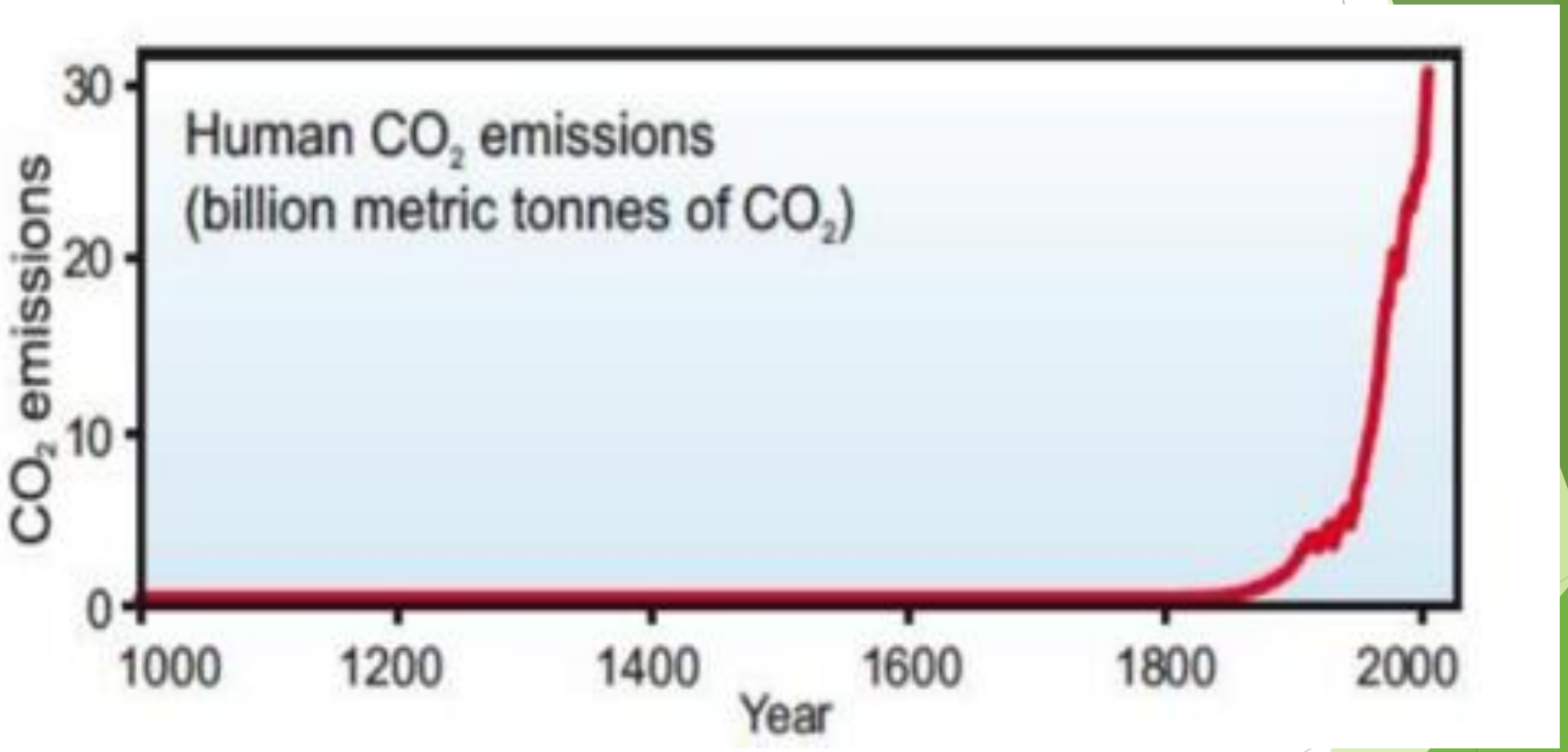
$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + ATP$$



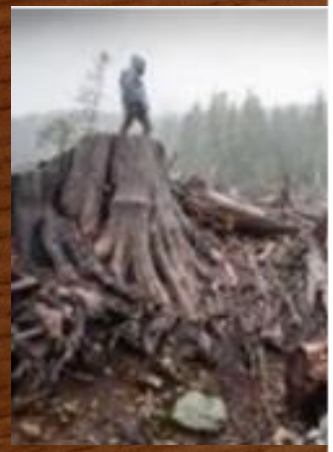
Natural Carbon Releases into the Atmosphere:



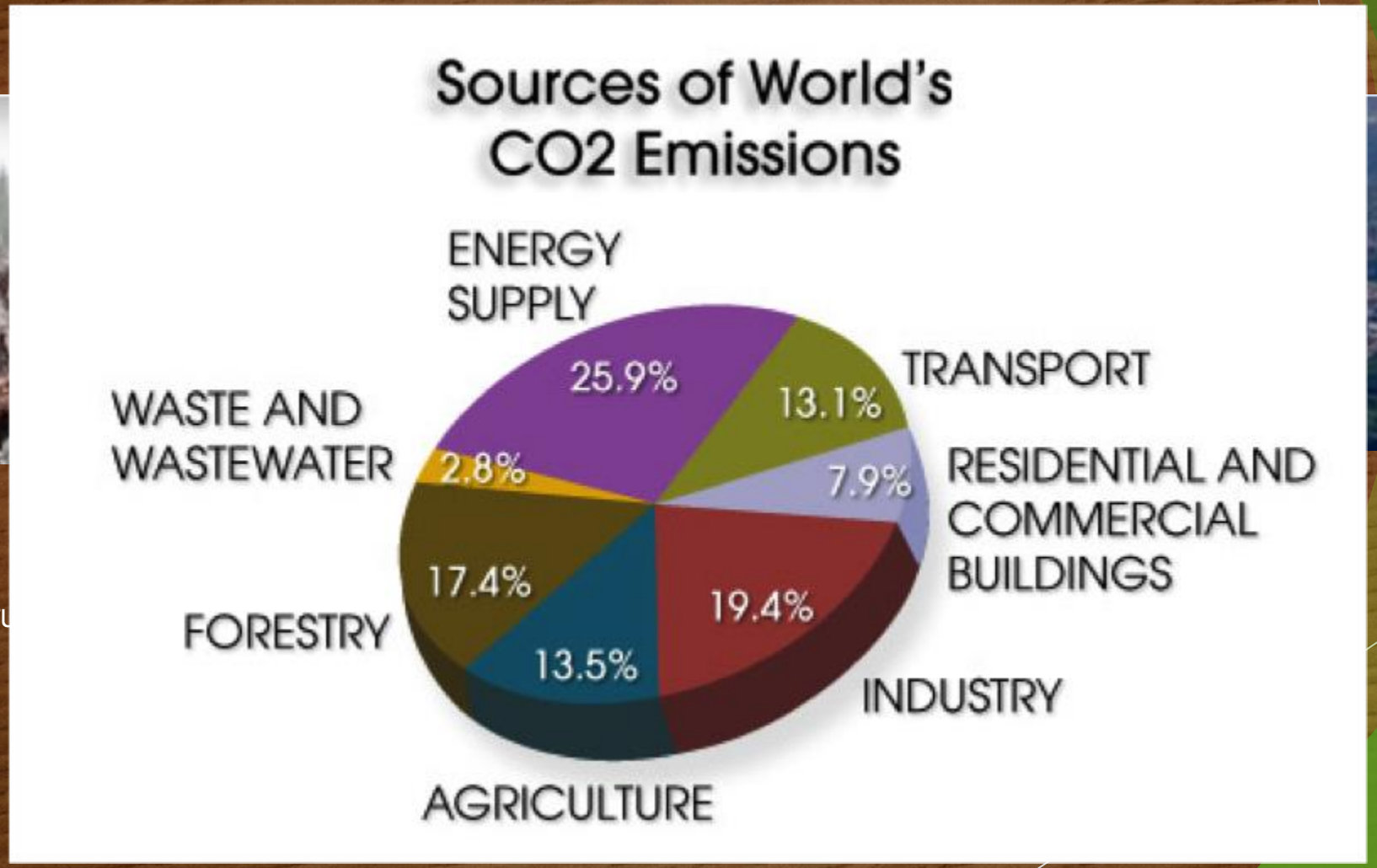
Gases containing carbon move between the ocean's surface and the atmosphere through a process called diffusion.

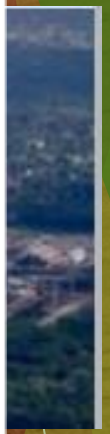


How Do Humans Place Carbon in the Atmosphere?
Humans place carbon into the atmosphere in a variety of ways.



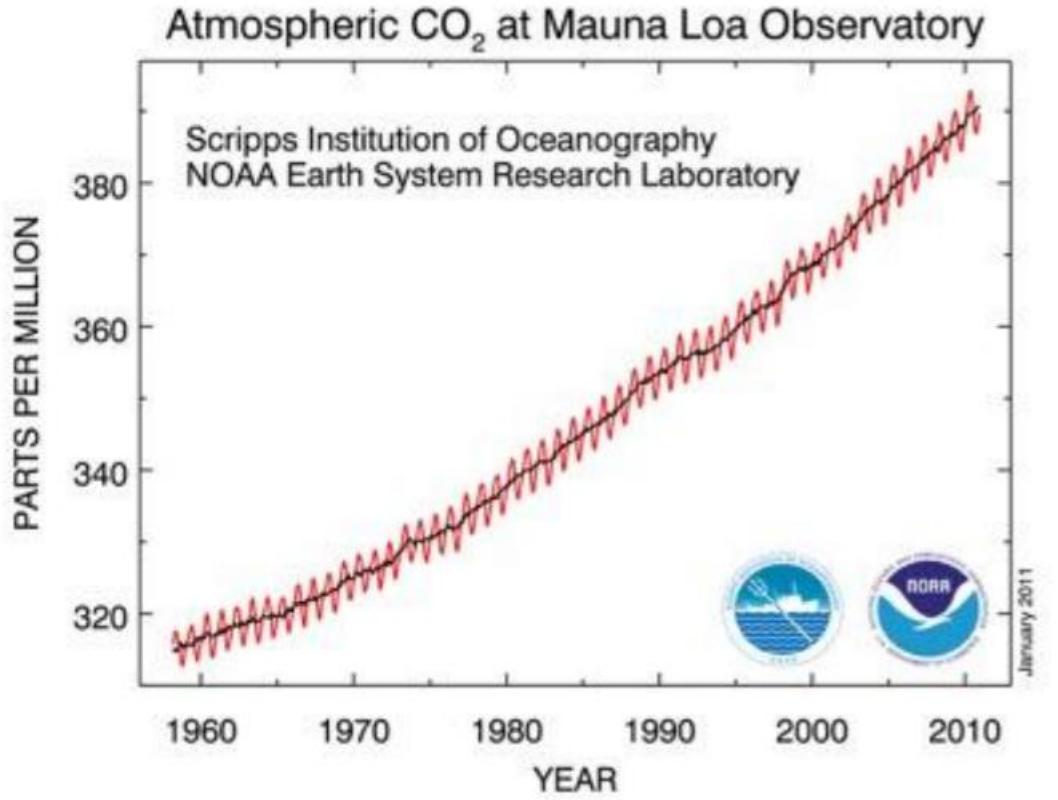
- DEFORESTATION
- FOREST FIRE
- BURNING OF FOSSIL FU





Why is it important?
Ans – The Keeling Curve

- Climate scientist Charles Keeling measured atmospheric carbon dioxide levels between 1958-2005 at the Mauna Loa Observatory on the northern slopes of Earth's largest volcano in Hawaii.
- His data, shown below, show the steady increase of carbon dioxide levels in the atmosphere.
- The red regular wobbles in the data reflect the seasonal growth of trees and plants in the Northern hemisphere
- During the spring and summer, trees and plants absorb carbon when they undergo photosynthesis, reducing the amount of carbon in the atmosphere. During the fall and winter, they decay, releasing carbon back into the atmosphere.
- This famous data display is known as the Keeling curve.



The measurements shown in this curve represent the world's longest continuous record of atmospheric carbon dioxide. This data was the first to confirm the rise of carbon dioxide in the atmosphere caused by the burning of fossil fuels.

The Amazon rainforest

is a critical influence on South American climate one of the world's most important carbon banks.

Covering almost as much land as the contiguous United States,
the Amazon is home to 20 percent of the planet's animal and plant species and
stores the equivalent amount of carbon as a decade of global fossil fuel emissions in its trees.
It plays a crucial role in the precipitation cycle of South America and pumps oxygen into the atmosphere,

earning it the nickname, the **'Lungs of the world.'**

Home to 200 indigenous cultures and 30 million people, the Amazon rainforest is under increasing pressure to provide subsistence and prosperity,
leading to deforestation. Each year, thousands of square miles of rainforest are cut down,
releasing global warming pollution in the form of carbon dioxide and methane
from burning and decaying vegetation.

Wildfires are common in the dry season but are also deliberately set by farmers illegally deforesting land for cattle ranching.

Need Of the Hour

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