

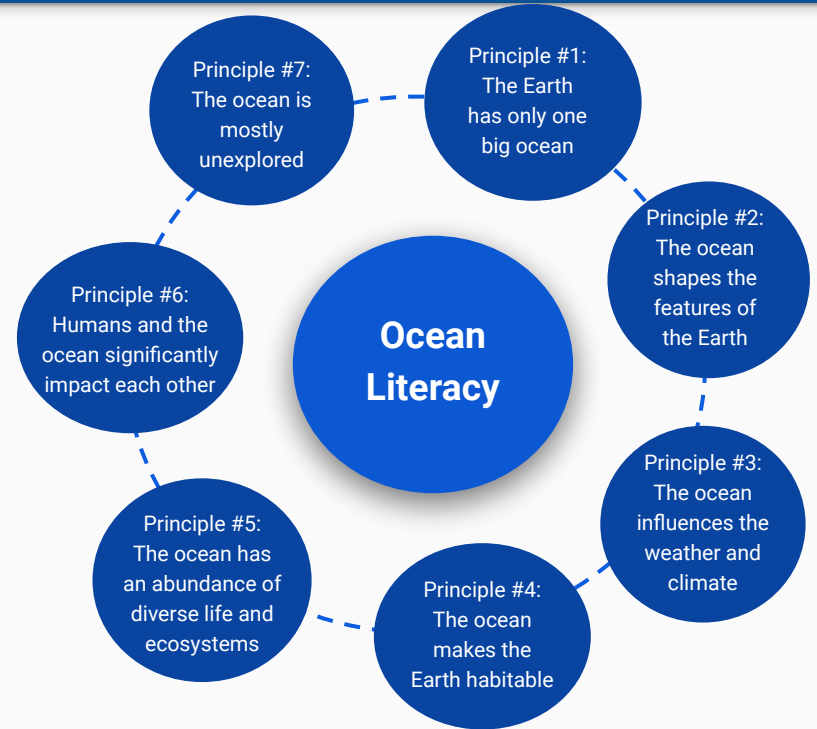
A dramatic photograph of a large ocean wave crashing, with water splashing and creating a tunnel-like structure. The sky is filled with heavy, grey clouds, and the overall color palette is dominated by various shades of blue and grey. In the background, a sandy beach and some dark trees are visible on the right side.

Lesson 1: Ocean Literacy

Ocean Literacy Principles

Watch for the FUN FACTS on the STICKY NOTES on each slide!

- Ocean Literacy is an understanding of the ocean, how the ocean impacts humans and how humans impact the ocean.
- The Ocean Literacy Principles are seven concepts that summarize the knowledge required to understand our ocean.



Principle #1: The Earth has only ONE ocean




- The ocean is just one large body of water that has several names
- The ocean makes up 97% of the water on the planet with its own unique chemical properties
- The size and shape of the ocean has changed overtime

Ocean Names:
- Pacific Ocean
- Atlantic Ocean
- Indian Ocean
- Southern Ocean
- Arctic Ocean

Principle #2: The Ocean shapes the features of the Earth

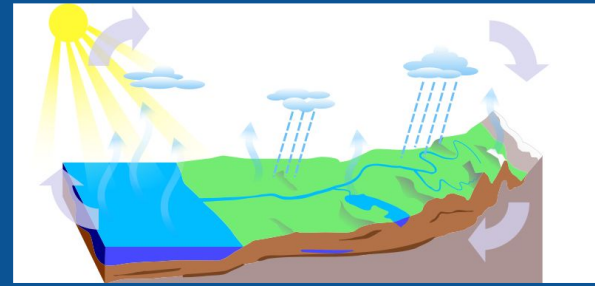
- When water meets land, it creates geologic changes like weathering and erosion
- The land is shaped by the ocean and water like rivers, lakes and streams
- Tectonic movement involving water and land results in volcanoes, mountains and tsunamis being created



Rocks formed
by water:
- Igneous
- Metamorphic
- Sedimentary

- Many rocks on land are formed by the ocean

Principle #3: The Ocean influences the weather and climate

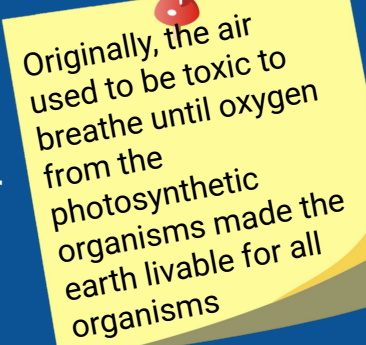


**WATER
CYCLE**

- The Ocean plays a large part in the water cycle as most of the rain is from the ocean
- The ocean absorbs most of the heat in the atmosphere
- The global climate is influenced by the amount of CO₂ in the atmosphere, the ocean absorbs about half of the CO₂ in the atmosphere.

Principle #4: The ocean makes Earth habitable for humans


- Most of the oxygen in the air is created by photosynthetic organisms in the ocean
- Scientists have discovered some ancient ocean sediments that show that some of the earliest forms of life came from the ocean



Originally, the air used to be toxic to breathe until oxygen from the photosynthetic organisms made the earth livable for all organisms

Principle #5: The ocean has an abundance of diverse life and ecosystems

- The ecosystems are different based on the pressure and depth, sunlight, chemical makeup and other aspects that make each ecosystem thrive
- Ecosystems with the greatest abundance are shown where the environmental conditions allow high levels of productivity
- The diversity in ecosystems allows for many unique life forms to thrive



As of 2015, there were **228,450** species in the ocean with potentially **2 MILLION MORE** that have not been discovered yet!!

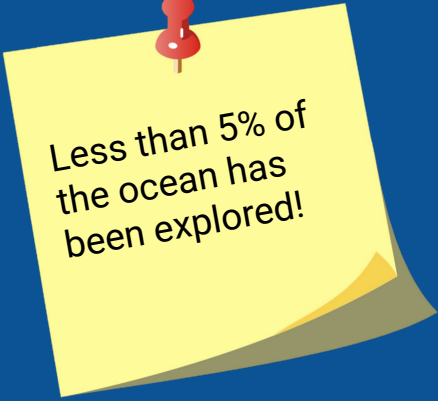
Principle #6: Humans and the ocean are connected



- The ocean affects the weather and climate
- The Earth would not be habitable for humans without the ocean
- The ocean influences population distribution for humans
- Human activity influences the ocean in positive and negative ways
- Individual and collective effort is required for maintaining a healthy ocean

Principle #7: The ocean is mostly unexplored

- Conditions like pressure, light, depth and temperature make it difficult to explore the ocean
- Collaboration and sharing of the information found in the ocean occurs on many levels including local, regional, national and international



Less than 5% of
the ocean has
been explored!

What Impact
Does Our Ocean
Have On Our
Lives?



Food and Water Source



The Ocean Produces What We Need To Survive



Photosynthetic organisms
produce about half the air
we breathe

Humans Use Resources From The Ocean



Some of the ingredients in some medicines come from the plants and animals in the ocean



Some of the energy we use is derived from the ocean. The energy sources range from wind to waves to natural gasses

Humans harvest Sea Salt from the oceans



The Ocean Influences The Distribution Of Humans On The Planet



Humans use the ocean for transportation

Ocean separates the different continents which distributes people



Civilizations established themselves near water, so most of our major cities are now near water as well

Water became a large part of culture. Below is the Aztec water god





The ocean absorbs and releases a lot of the heat from the atmosphere which makes the earth habitable.



Those living by the coastline may be affected by tsunamis, hurricanes, typhoons or rising sea levels.



The Ocean Influences The Weather And Climate

What Impact Do
Humans Have On
The Ocean?

Human Activity Contributes To Changes In Our Ocean



Fishing and aquaculture if done correctly, can help the ecosystems. If done incorrectly, like overfishing, it can be harmful to the environment and can contribute to the extinction of a species

The introduction of non-native species, like the one below, can interrupt the food web, introduce diseases, compete for resources and lead to change in the ecosystem.



Man-made modifications like dams affect the landscape and the species that live in the oceans and rivers. Other man-made modifications on the coastline can damage ecosystems and cause erosion.

Pollution and Climate Change Impact The Ecosystems and Life In The Ocean



Trash pollutes the ocean which ocean animals mistake for food and choke on. Nets and plastic can holders can get caught around animals necks and kill them as well. Toxic substances entering the ocean can lead to the death of animals or even acid rain.

Human activity creates greenhouse gasses which trap heat in our atmosphere. As we already know, the ocean absorbs most of the heat in our atmosphere. However, the ocean warming up results in less oxygen in the ocean for the fish to breathe. The rising temperatures can also kill off entire ecosystems. For example: coral reefs die when the ocean temperatures increase making an entire ecosystem of life lost.



Humans can take actions to clean up the marine environment through beach clean ups, and underwater clean ups.



Scientists continue to learn about and study the ocean. The above image shows a marine biologist treating and restoring a marine environment.

Teachers teach about marine conservation in schools and other organizations are spreading the word about marine conservation as well as other problems relating to the ocean.



Some Human Actions Contribute To Maintaining, Conserving And Sustaining A Healthy Marine Environment