What technology is used to study the oceans?

* As early as 600 B.C. the Phoenicians were exploring the ocean surface by **\_\_\_\_\_\_\_\_\_\_\_\_\_**
* In 1000 the Chinese discovered the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** so navigating the ocean became easier
* 1825 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** gear was invented so man could spend more time under the water exploring
* 1920’s **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (**so**und **n**avigation **a**nd **r**anging) was invented due to a need to detect submarines. Another application is to use sound waves to map the **\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_**.
* 1934- 1st **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** --Deep sea dive in a steel ball

Now: submersible vehicles with humans; remotely operated vehicles(ROV’s) from ship on the surface

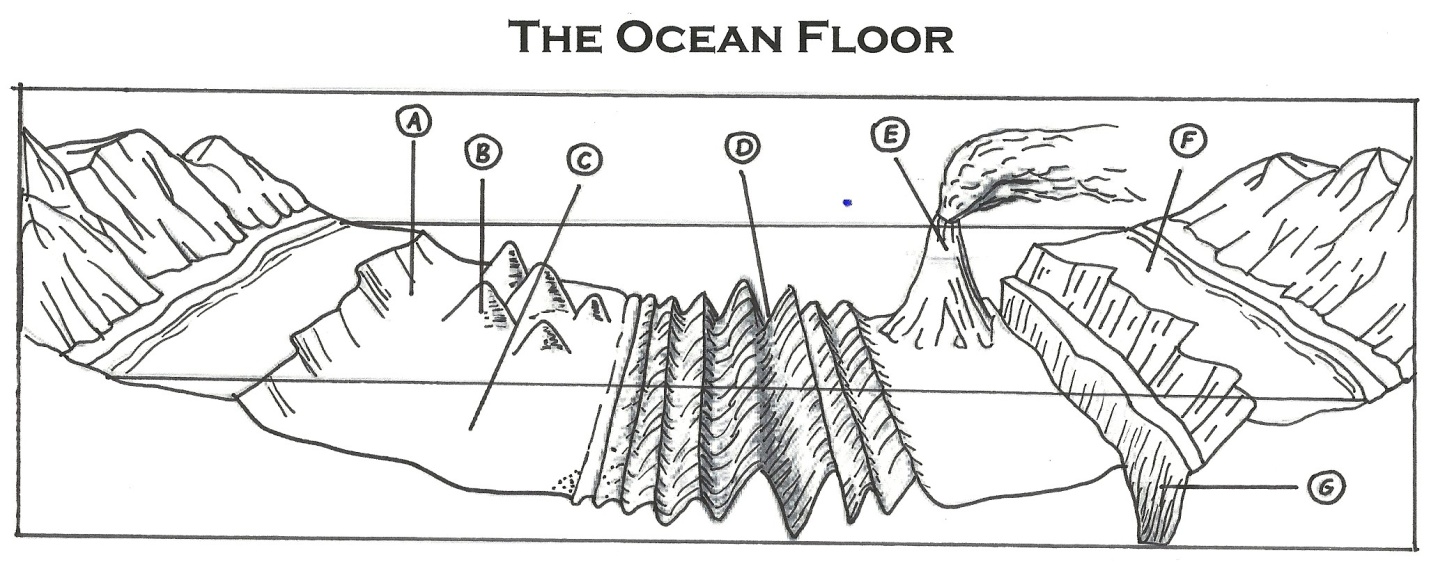
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_** is using **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** or aircraft to gather data from afar. Then when the scientist go to the site to verify it is called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_**. Ex. Mapping ocean **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** temperatures

**Direct and Indirect observations- Classify each technology at your desk into these two groups**.

Direct Observations-

Indirect Observations-

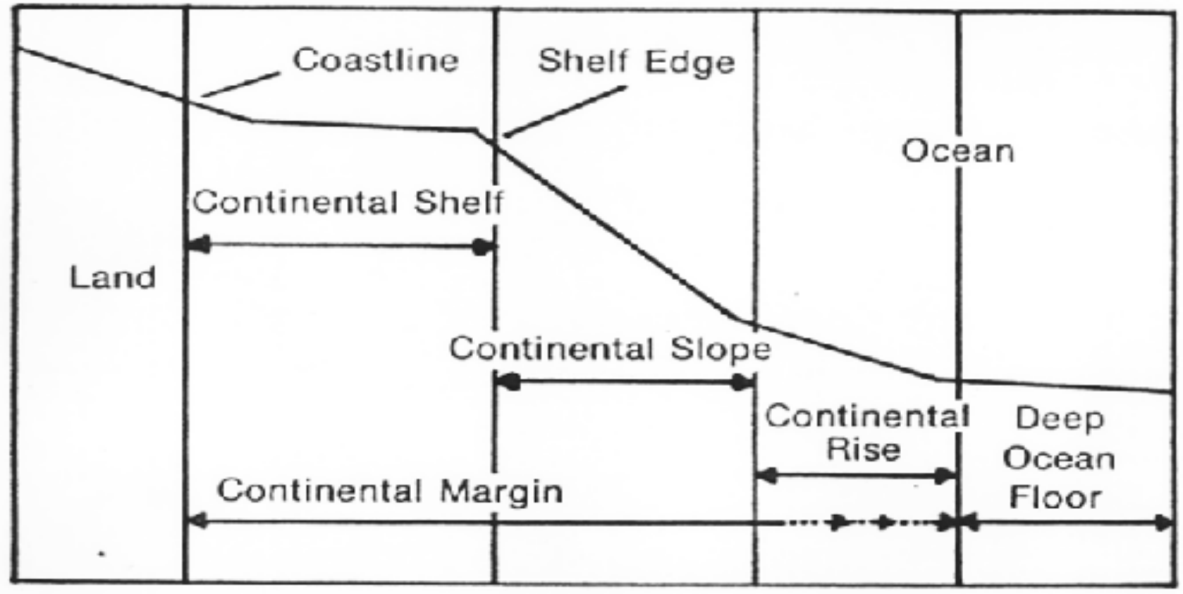
***Seafloor Topography***

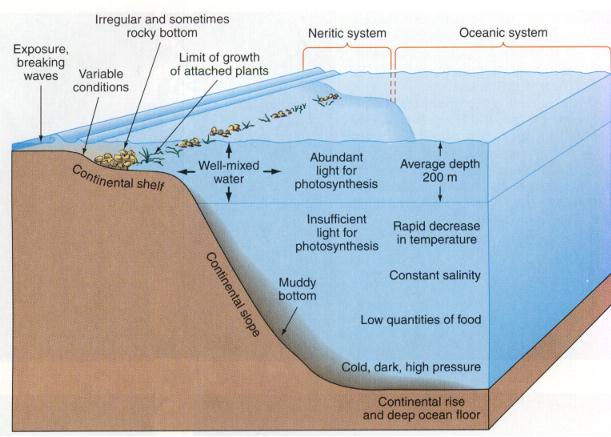
* + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_**- gently sloping area of ocean floor that extends from the beach out to sea
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_**-steep edge where the shelf drops off to deeper water
  + **\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_**- flat regions in the deep ocean
  + **\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_**-continuous range of volcanic mountains winding around the earth through the entire world’s ocean. It is nearly 80,000 k m long.
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**- a volcanic mountain whose peak does not break the surface of the ocean.
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– canyon deep on the ocean floor. The Mariana Trench in the Pacific Ocean is 11 km deep and the deepest point in the ocean

Ocean Habitats and Zones

* The ocean is a huge community of living and nonliving things. The habitat zones of the ocean are: Intertidal zone, Neretic zone, open ocean zone (Bathyl and Abyssal Zones).

\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_



* Intertidal Zone
  + Organisms that live in this zone must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of changes in the environment.
  + Organisms must be able to withstand changes in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to air.
* Neretic Zone
  + It is home to a variety of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms.
  + There is plenty of \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the water.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are washed from the land into the oceans from rivers and estuaries.
* Open Ocean
  + The Open Ocean contains few nutrients and a small amount of sunlight.
  + Algae/ phytoplankton in the surface zone is the main food supply for organisms.
  + Light and pressure
* In each zone, there are distinct physical factors such as the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** These factors determine which organisms live where. Organisms in the ocean are classified by where they live & how they move!
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_** is the habitat zone of microscopic algae, krill, jellyfish, young crustaceans, and fish. These organisms float & move with the waves and currents***. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** are algae, diatoms, . . (plants) and ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** are animal.
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are the classification of large fish, mammals, reptiles, . . . They are animals that can move freely throughout the ocean. Ex. Squid, whales, sharks, fish, seals, . .
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are animals that live on the seafloor. Some benthos move freely. Lobsters, sea stars, crabs would be an example. Some benthos are attached like sea anemones, corals, sponges.