Principle 5: Grades 3-5

The ocean supports a diversity of life and ecosystems

A. Most of Earth’s living space is found in the ocean.
   - The ocean can support a variety of organisms throughout the entire water column.
   - Environmental factors such as salinity, pressure, substrate and temperature vary through the ocean, providing a variety of ocean habitats and promoting diversity.

A.2. The ocean can support a variety of organisms throughout the entire water column.
   - Primary producers form the base of all ocean food webs.

A.3. Due to the vast living space in the ocean, most primary productivity on Earth occurs in the ocean.
   - Some primary producers use sunlight as an energy source.
   - Some primary producers use energy sources other than sunlight.

A.4. Organisms in the ocean exhibit an amazing variety of life cycles. Some organisms are metamorphic, many have planktonic phases, some change sex.
   - The ocean supports a tremendous variety of sizes of organisms from extremely small to the largest animal ever to live on Earth.

B.1. A great diversity of habitats, stemming from environmental factors associated with living in a liquid environment, provides the opportunity for a great diversity of adaptations such as body structures, behaviors, and life histories.
   - There are large ecologically important habitats that exist in the deep sea that are not dependent on photosynthesis.
   - Some of these life cycles are unique to the ocean such as those of seahorses, corals, and kelp.

B.2. There are adaptations & life histories that exist only in the ocean because of its unique environmental properties.
   - Organisms in the ocean can produce energy from the chemicals released in deep sea vents just as green plants & algae produce energy from sunlight.

B.3. Since the ocean is light limited marine animals of all kinds from shrimp to whales use sound to communicate, see, capture prey, find mates & sense their environments.
   - Migration (horizontal & vertical) is a life strategy used by marine organisms to respond to changes in the environment, such as the seasonal availability of food, and changes in light and tidal levels.

B.4. There are large ecologically important habitats that exist in the deep sea that are not dependent on photosynthesis.
   - Organisms in the ocean exhibit an amazing variety of life cycles. Some organisms are metamorphic, many have planktonic phases, some change sex.

B.5. Adaptations that allow organisms to survive in an aquatic environment include: blubber to retain heat, fins for swimming, gills for removing oxygen from water, collapsible lungs for deep diving, & acute hearing underwater.
   - Some of these life cycles are unique to the ocean such as those of seahorses, corals, and kelp.

B.6. Migration (horizontal & vertical) is a life strategy used by marine organisms to respond to changes in the environment, such as the seasonal availability of food, and changes in light and tidal levels.
   - The ocean supports a tremendous variety of sizes of organisms from extremely small to the largest animal ever to live on Earth.

B.7. Some organisms can produce energy from the chemicals released in deep sea vents just as green plants & algae produce energy from sunlight.
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C.1. Over half of all phyla occur only in the ocean; only one phyla occurs only on land. The diversity of major groups of organisms is much greater in the ocean than on land.
   - There are some groups of organisms that occur in the ocean that do not occur on land (e.g., starfish).

C.2. The ocean supports a tremendous variety of sizes of organisms from extremely small to the largest animal ever to live on Earth.
   - Most of the organisms in the ocean are tiny; most of the biomass in the ocean is made up of tiny organisms.

see Principle 4