Grades 9 Through 12

Principle 5, Part 1

The ocean supports a great diversity of life and ecosystems.

Primary Productivity

- Photosynthesis, such as phytoplankton and phytoplankton, are the most abundant animals, and the most important primary producers in the ocean. They are the base of most of the food webs in the ocean.
- Primary production is the net gain in organic matter that occurs when producers make more organic matter than they use in respiration.
- Chemosynthesis, the green pigment found in microalgae, algae, and cyanobacteria, uses energy from sunlight and/or water, and water, nitrogen and others to convert organic material into usable energy.
- Most of the nutrients needed for primary productivity are derived from nutrient-rich waters. They are transported from the surface and the ocean floor as a result of upwelling and downwelling.
- There is a direct relationship between primary productivity and upwelling. The highest levels of primary productivity are near the polar regions and in upwelling zones where there are high levels of nutrients and sunlight.

Ecosystem Diversity

- Ocean ecosystems are often composed of habitats and microhabitats that exist in distinct, vertically distributed zones. Vertical zonation results in distinct horizontal layers or bands on the coastline and throughout the water column.
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- Ocean ecosystems support a large number of fish species, including many that are commercially important. Some of these fish migrate to distant areas to spawn.
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- Many coastal organisms are adapted to live only within distinct density layers or in zones defined by temperature or light levels.
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- Riches in the cenote are a very dynamic environment, contributing to the high diversity seen in this region. Many open ocean species are adapted to live only within distinct density layers or in zones defined by temperature or light levels.
GRADES 9 THROUGH 12
A Handbook for Increasing Ocean Literacy

Principle 5, Part 3
The ocean supports a great diversity of life and ecosystems.

The ocean provides a vast, interconnected living space where diverse and unique organisms exist from the surface through the water column down to the sea floor.

Diversity of Life Cycle and Reproductive Strategies

Organisms in the ocean have a variety of reproductive strategies and life cycles.

Reproductive strategies of marine organisms tend to be related to population density of the species, and the social structure and competition and chance of finding mates.

Marine organisms have strategies for finding mates and maximizing fertilization of eggs in the vast ocean.

Diversity of Feeding Behavior

Diversity of ocean ecosystems varies for marine habitats and adaptations of ocean organisms.

Diversity of Life

The diversity of ocean ecosystems varies for marine habitats and adaptations of ocean organisms.

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