Marine Life

- There are more than 250,000 identified marine species.
- Most live in sunlit surface seawater.

Think about it….

What zone of the ocean would you expect most life to live in???

Marine Life

- A species' success depends on the ability to
  - find food,
  - avoid predation,
  - reproduce, and
  - cope with physical barriers to movement.
- Marine organisms are adapted to the ocean's physical properties.

Classification of Marine Organisms

- Plankton (floaters)
- Nekton (swimmers)
- Benthos (bottom dwellers)

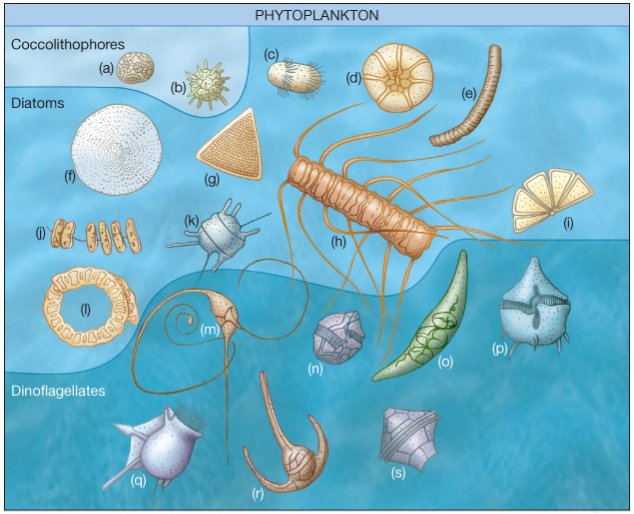
Plankton

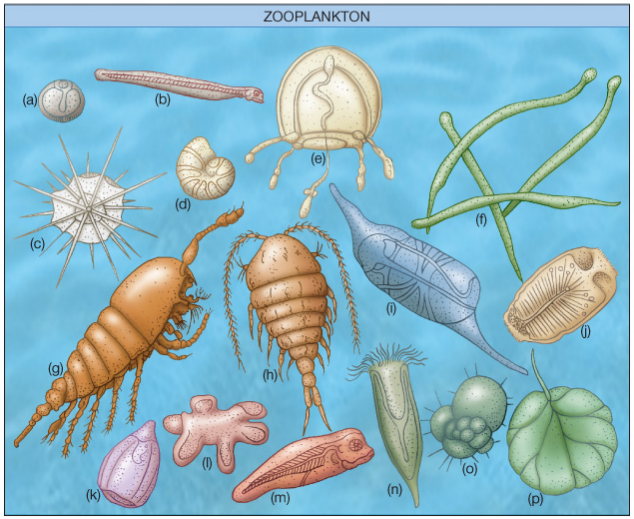
- Organisms that live in large bodies of water and are unable to swim against the current.
- Include bacteria, archaea, algae, protozoa and small floating animals
- Defined by niche not taxonomy

*Most biomass on Earth consists of plankton.

Types of Plankton

- Phytoplankton
  - Autotrophic
  - Makes own food (photosynthesis, or chemosynthesis
- Zooplankton
  - Heterotrophic
  - Gets energy from eating things

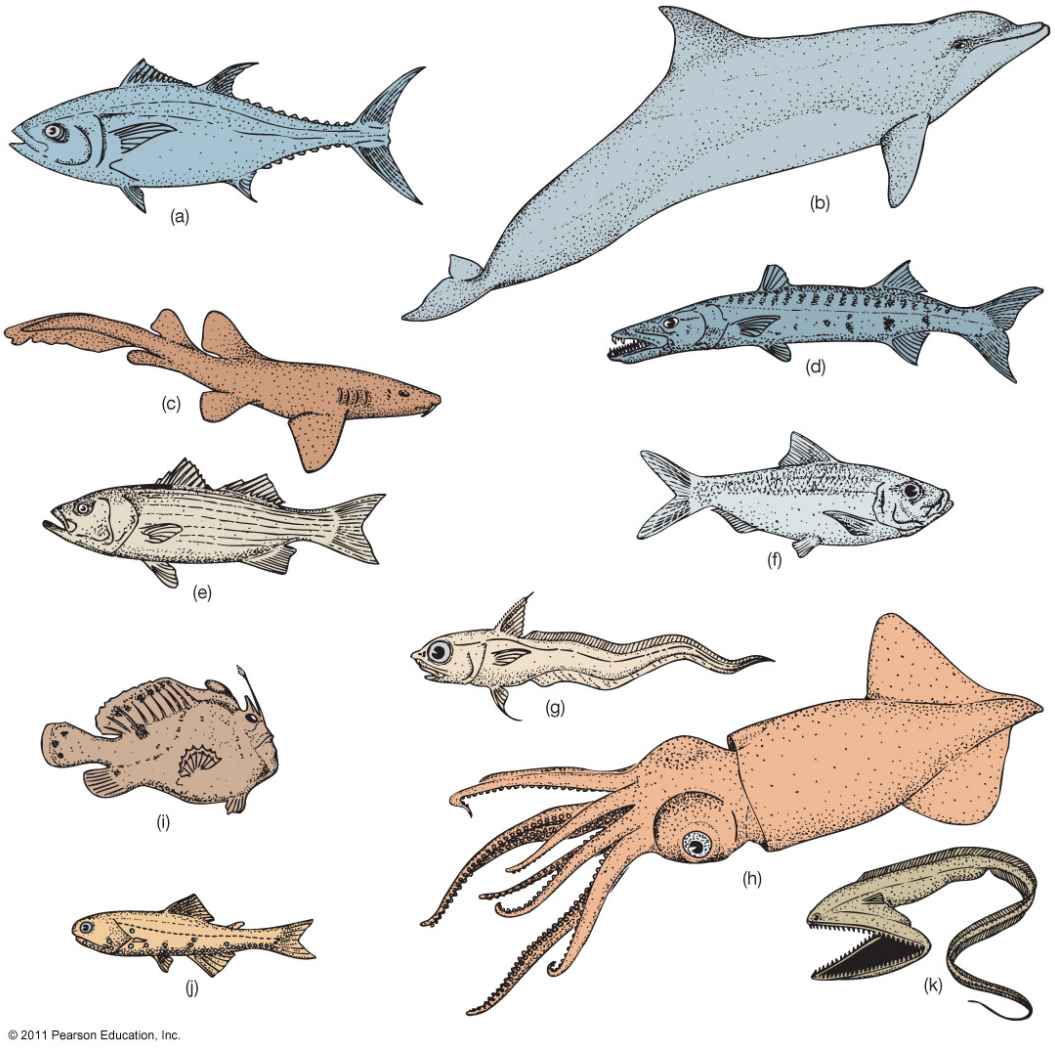




Nekton

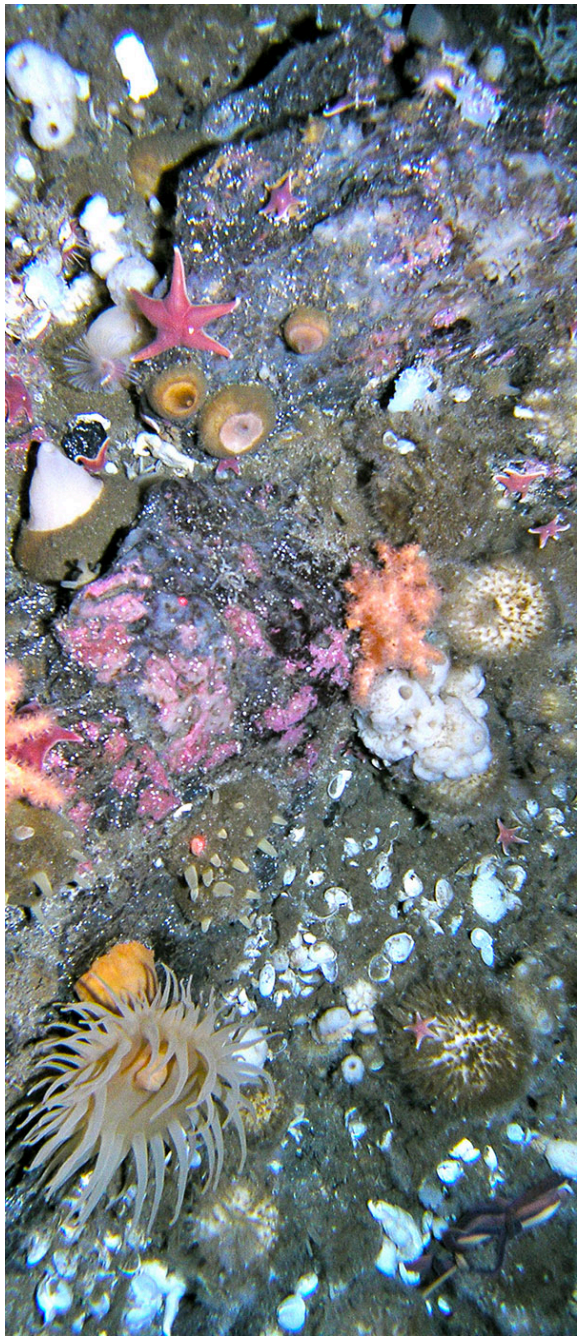
- Independent swimmers
- Most adult fish and squid
- Marine mammals
- Marine reptiles

Nekton

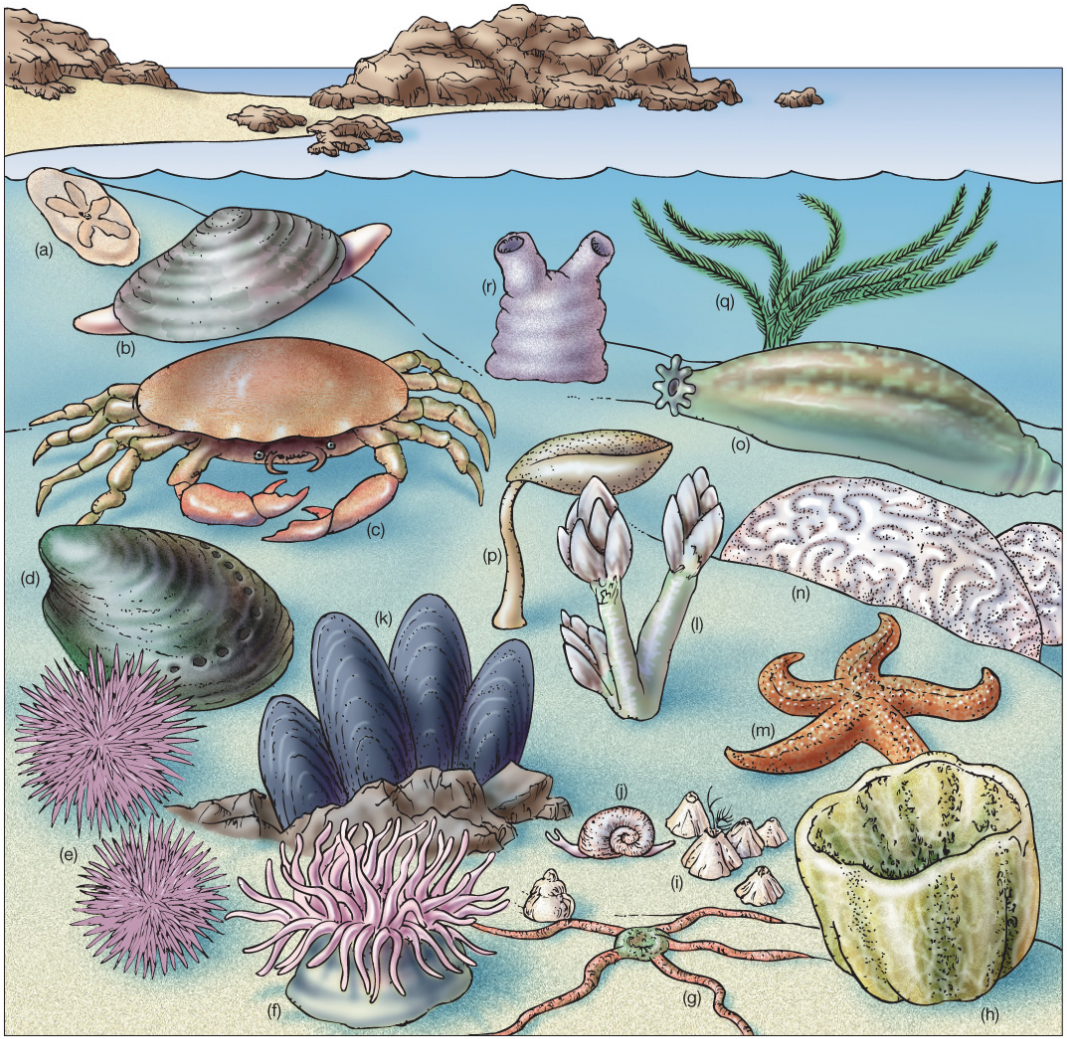


Benthos

- Epifauna live on the surface of the sea floor.
- Infauna live buried in sediments.
- Benthos are most abundant in shallower water.
- Many live in perpetual darkness, coldness, and stillness.



Benthos



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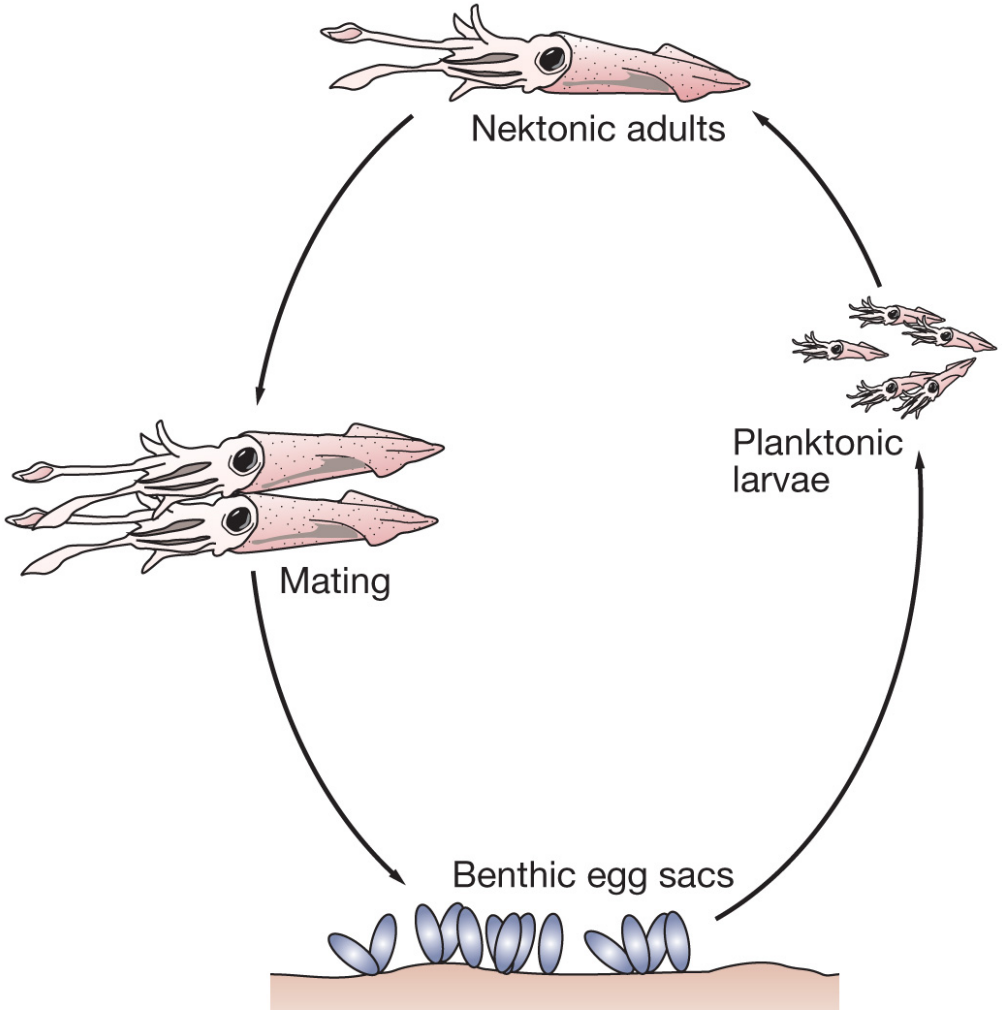
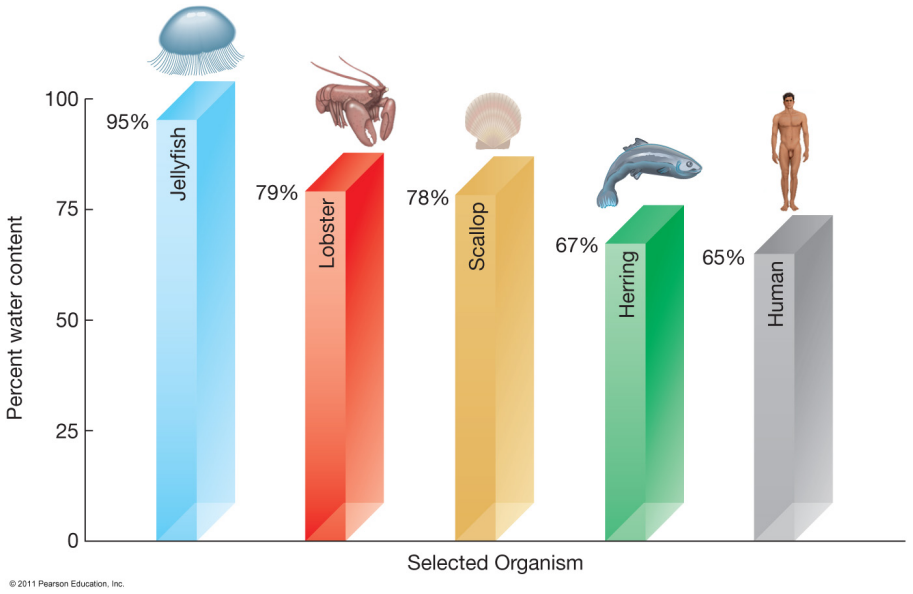
Life Cycle of a Squid



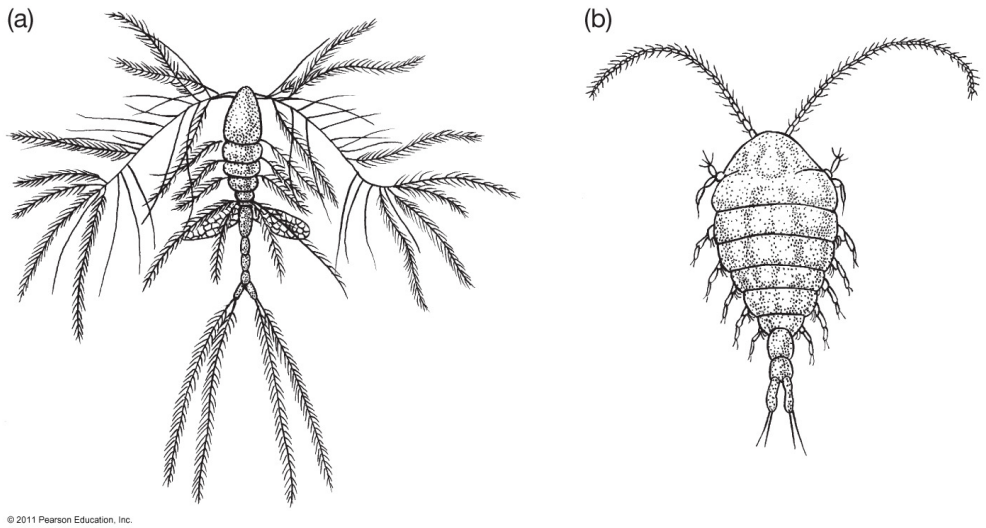
Adaptations of Marine Organisms

- The marine environment is more stable than land.
- Organisms in the ocean are less able to withstand environmental changes.
- Marine animals do not risk desiccation.



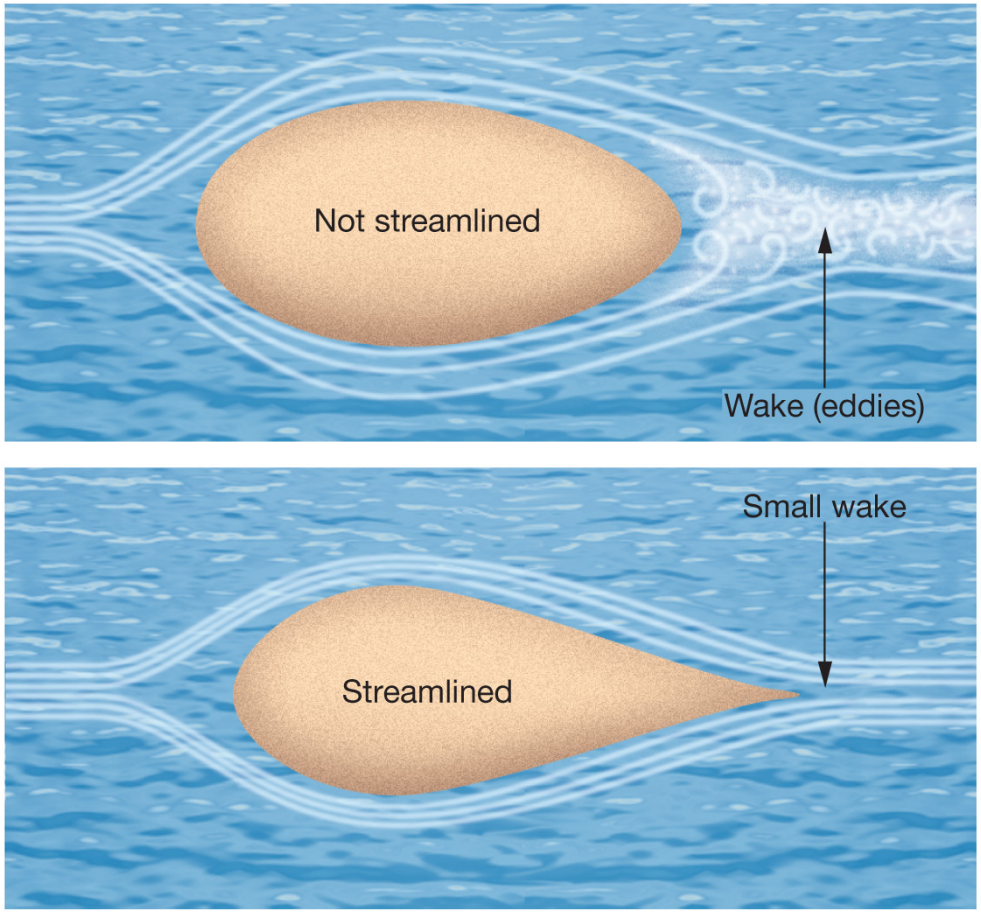
Adaptations of Marine Organisms

- Physical support
  - Buoyancy
  - How to resist sinking
  - Different support structures in cold (fewer) rather than warm (more appendages) seawater
  - Smaller size



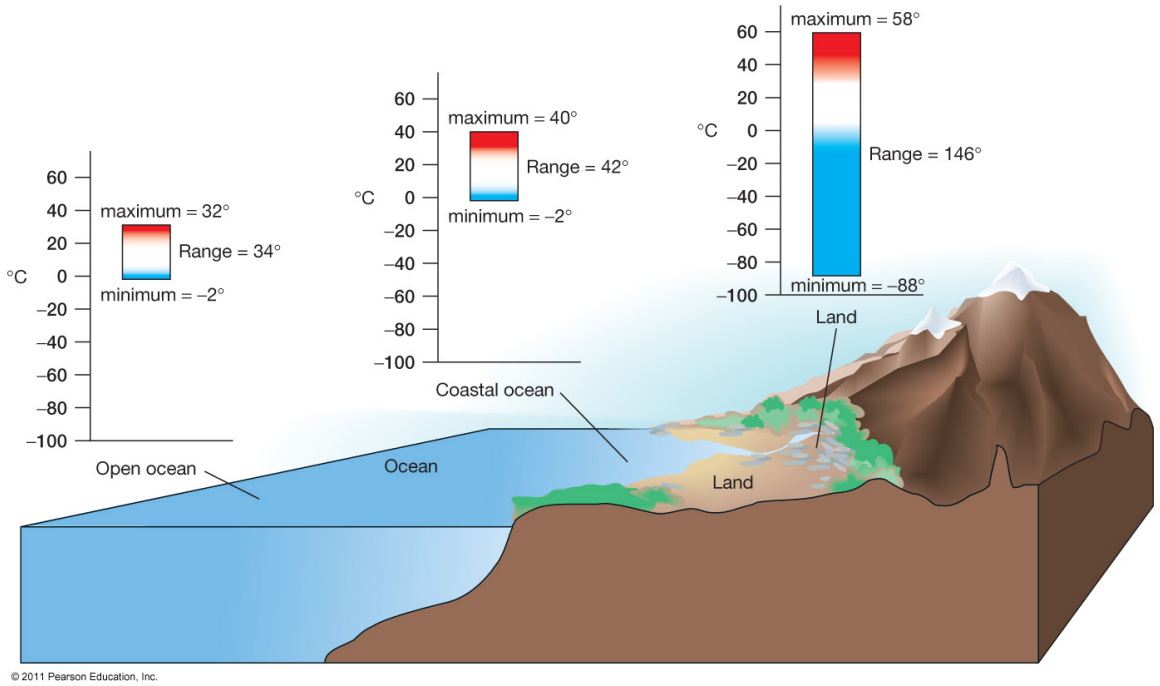
Viscosity and Streamlining Adaptations

- Streamlining important for larger organisms
- Less resistance to fluid flow
- Flattened body
- Tapering back end



Temperature and Marine Life

- Narrow range of temperature in oceans
- Smaller variations (daily, seasonally, annually)
- Deep ocean is nearly isothermal



Ocean Temperature

- More stable than land for four reasons
  - Higher heat capacity of water
  - Ocean warming reduced by evaporation
  - Solar radiation penetrates deeply into ocean layers
  - Ocean mixing

Cold vs. Warm Water Species

- Smaller in cooler seawater
- More appendages in warmer seawater
- Tropical organisms grow faster, live shorter, reproduce more often
- More species in warmer seawater
- More biomass in cooler seawater (upwelling)