Waves transfer energy from the wind to the water, but do not move the actual water mass. Wind waves start out as tiny capillary waves. Waves behave differently as they reach shallow water.

Objectives

- Compare the most common types of waves, including their causes and their relative size and including tides.
- Compare the three most common types of tides observed and learn where in the world each type is typically found.
- Describe the Coriolis effect and how this determines the direction of surface water movement and upwelling.
- Learn all of the gyres.
- Become familiar with major currents near N. America

The Ocean in Motion- WAVES

- Waves transfer energy from the wind to the water, but do not move the actual water mass.
- **Wind waves** start out as tiny capillary waves.
- Waves behave differently as they reach shallow water.

Breaking Waves

Formed when the wave collapses on top of itself.

- **Plunging Breaker** – The wave reaches a steeper beach and curls, moving over a pocket of air. It travels very fast.
- **Spilling Breaker** – The wave reaches a sloping sandy beach, dispersing the energy over a large area.

https://www.marineinsight.com
Vocabulary related to waves

Properties of waves
- Wavelength
- Wave height
- Crest
- Trough
- Period

Unusual Waves

I. Tsunami
II. Rogue
III. Sneaker

Tides

Tides are long-period waves caused by the moon-Earth and sun-Earth systems.
Spring and neap tides

Types of Tides

- Land masses affect tidal water motion and create different tidal patterns around the globe.
- Semidiurnal, diurnal, and mixed semidiurnal.
Surface Currents
Caused by winds transferring momentum to the water
- Stable wind patterns lead to large, slow moving currents that transfer huge volumes of water.

Gyres
- Circular moving surface currents.
  - Gyres are caused by currents from different directions merging.
  - Gyres can be huge.
- Eddies are smaller versions of rotating currents that sometimes travel long distances.

Case Study: The Great Pacific Garbage Patch
- Garbage is carried many kilometers and trapped in gyres.
- Plastic does not break down for thousands of years, and small bits remain in a plastic soup.

2.1 The Ocean in Motion
El Niño
- El Niño is a departure from normal current patterns at the equator.
- The thermocline is depressed and surface water temperatures soar.
- Weather patterns around the globe are impacted.

NOAA Marine Debris Program

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