

Introduction to Ocean Currents

The Big Shift in Thinking:

- Contrary to old beliefs, the ocean is in _____ motion, not still.
- What are Ocean Currents? The _____ that circulates water around the entire world.
- The global system of currents is essential because it distributes _____ to all regions of the Earth.

Driving Forces & Impact

- List the 5 factors that direct ocean currents:
 1. _____ (saltiness)
 2. _____
 3. _____
 4. The _____ Effect
 5. Breaking _____
- Ocean currents are a primary factor in determining the _____ of various regions on Earth.

Salinity and Temperature

- **The Big Picture:** _____ and _____ are the primary factors that control ocean water density and movement.
- **What is Salinity?** The total amount of _____ in ocean water.
- **The Density Rule:**
 - **High Salinity** = _____ Density (Boats float higher; water freezes at lower temperatures).
 - **Cold Temperature** = _____ Density (Cold water is "heavier" than warm water).
- **The Resulting Motion:**
 - Differences in density cause ocean water to _____ and move.
 - Less dense water rises/moves _____ more dense water.
 - This vertical movement creates global _____.

The Ocean Conveyor Belt

Thermohaline Circulation

1. The Ocean Conveyor Belt is also known as _____ circulation.
2. The prefix "thermo" refers to _____, while "haline" refers to _____.

3. These are primarily _____ ocean currents that are driven by _____.

The Sinking & The Flow

- In the North Atlantic, water sinks because it becomes _____.
- This sinking water pushes deep water toward the continent of _____.

Rising & Returning

- _____ occurs when water warms up, becomes less dense, and rises to the surface.
- This rising water is important because it brings _____ to the surface.
- The cycle is completed when warm water flows back into the _____ Ocean, flowing North to start again.

Surface Currents and Winds

- Surface currents make up approximately _____% of all ocean water.
- These currents are usually limited to the upper _____ meters of the ocean.
- The two main drivers of surface currents are _____ and the _____ Effect.

Physics of the Coriolis Effect

- Gravity pulls _____ (up and down), while the Earth rotates from _____ to _____.
- The Earth's rotation creates a sideways _____, which curves the lines of force acting on both the _____ (gas) and the _____ (liquid).
- This curving of moving objects (like wind and water) due to Earth's rotation is called the _____.

Ocean Gyres

- The Coriolis Effect creates whirling wind movements that produce both horizontal and _____ on the ocean's surface.

- A large system of rotating ocean currents is called an _____.
- Because of the Coriolis Effect, gyres in the **Northern Hemisphere** rotate _____.
- In the **Southern Hemisphere**, gyres rotate _____.
- An ocean gyre is usually caused by the combination of large _____ movements and the _____.

Anatomy of a Wave

- A wave is defined as a _____ in a medium that transfers _____.
- The most common cause of ocean waves is _____.
- Two things determine how large a wave will be: _____ and the _____ covered by the wind.
- Because waves store _____, they can travel thousands of miles even after the wind stops.

Measuring the Water

- The highest point of a wave is the _____.
- The lowest point of a wave is the _____.
- _____ is measured vertically from the trough to the crest.
- _____ is measured horizontally from one crest to the next.
- _____ water level is the level of the ocean without any wave action.