

Unit 5

Motion in the Ocean

UEQ:

How does energy from the sun drive Earth's wind and surface currents

Concept 1

Winds

&

Currents

LEQ 1: How does solar energy create global wind patterns?

Wind is moving air created when heat from the sun travels through Earth's atmosphere and warms it.

- As the air warms up it rises and cooler air sinks to fill the space left by the rising warmer air.
 - This causes air to move in a circular pattern.

LEQ 1: How does solar energy create global wind patterns?

- Air at the equator receives the most direct sunlight and rises. 30° north and 30° south of the equator this air begins to cool and sinks flowing back toward the equator.
 - Warm air that rises farther than 30° north and south of the equator moves towards the poles as it cools and sinks.
- This is known as the global wind pattern.

LEQ 2: What factors determine the direction of surface currents?

Currents are like rivers of moving water flowing through the ocean.

- Surface currents occur from 0m to 400m deep.

LEQ 2: What factors determine the direction of surface currents?

There are two factors that determine the direction of surface currents, water density and wind.

- Changes in water density caused by changes in water temperature create a circulation of ocean water.

LEQ 2: What factors determine the direction of surface currents?

- Wind travelling across the ocean transfers energy from the air to the water. Therefore surface currents follow global wind patterns.

LEQ 3: How are wind patterns and surface currents influenced by the Coriolis Effect?

Earth's rotation on its axis causes winds and currents to curve instead of travelling parallel to the equator.

- In the northern hemisphere wind and currents curve towards the right (clockwise).
- In the southern hemisphere wind and currents curve towards the left (counter clockwise).

The curving of wind and currents caused by Earth's rotation is called the Coriolis Effect.