# Ocean Currents - Notes

<table>
<thead>
<tr>
<th>What is an ocean current?</th>
<th>A large ________ of moving _________ that flows through the _________.</th>
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| **Currents are Important** | **Because….**  
1. They help to ________ boats and ships.  
2. They ________ nutrients around the oceans  
3. They bring up small organisms and plants to the surface so that animals like birds can feed on them (_________ and __________).  
4. Effects __________ (El Niño and La Niña) |
| **Difference between Waves and Currents** | Unlike waves, currents ________ water from one ________ to another. |
| **Two types of ocean currents** | ________ Currents and ________ Currents |
| **Surface Currents** | Surface currents, which affect water to a depth of several hundred meters, are driven MAINLY by _________.  
**Surface currents are caused by the following:**  
1. Winds  
2. The Earth’s Rotation (_________ Effect)  
3. Temperature _________ in ocean water  
4. Continents (continental Deflection) |
| **The Coriolis Effect** | The Earth’s rotation causes wind and surface currents to move in curved paths rather than in straight lines. Due to this:  
Currents in the 2 hemispheres move in different directions.  
- Currents in the northern hemisphere move in a clockwise direction. (from 12- 6 o’clock, OR from East to West)  
- Currents in the southern hemisphere move in a counter clockwise direction (like going backwards on a clock OR from West to East). |
| **Temperature Differences** | There are ________ currents and ________ currents.  
- Warm water wants to move from the equator to the poles  
- Cold water wants to move from the poles to the equator  
This creates a consistent movement of water.  
- The cold water ________ to the bottom and moves towards the equator WHILE  
- The warm water ________ and moves towards the poles.  
**Warm currents** - Some currents carry warm water (eg. The Gulf Stream)  
**Cold currents** - Some currents carry cold water (eg. The California Current)  
- Warm currents start at the ________  
- Cold currents start at the north and south ________  
- Therefore warm currents flow from the ________ to ________  
- Cold currents go from ________ to ________ |
| **Ocean Gyres** | Ocean gyres are ________ system of circular ocean currents formed by global wind patterns and forces created by Earth’s rotation.  
The five major circulation patterns formed by the currents on this map are the world's five major ocean gyres: North Atlantic, South Atlantic, Indian, North Pacific, and South Pacific. (The Indian Ocean Gyre is actually two, split slightly below the Equator.) |
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**Deep Currents**
Stream like movements of ocean water far ______ the surface. Deep Cold Currents flow _______.

*Caused* by differences in the _________ of ocean water.

1. Surface currents carry warm water toward the poles.
2. As the water cools, ice forms. The colder, saltier water is denser and sinks.
3. Deep currents carry cold, dense water toward the equator.
4. As the water warms, it becomes less dense and rises.

**Global Conveyor Belt**

**Tidal Energy – The Energy from Tides**
Clean, renewable ________ of energy.

Harnessing tidal energy only possible when tidal range is at least ____ or _____ meters.

Very _______ locations are suitable for tidal power plants.