

Name: _____

Class: _____

Grade 8 SCIENCE – GUIDED NOTES

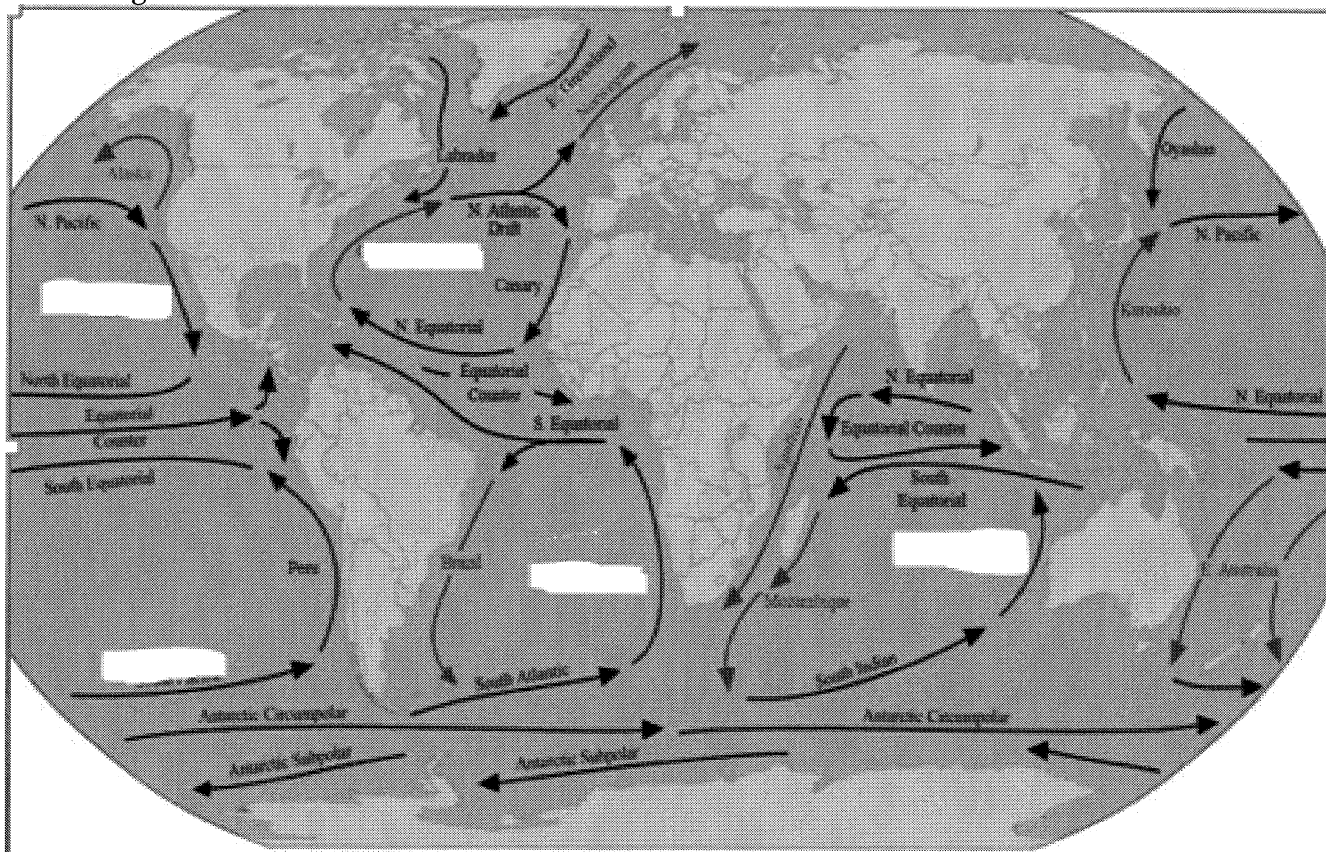
Ocean Currents Impact on Climate and Weather PPT

What is an **ocean current**?

3 Types of Ocean Currents are:

- 1.
- 2.
- 3.

Label the missing ocean currents below:



What are **surface currents**?

How are surface currents formed?

Surface currents carry _____ and cold water _____ across the ocean's surface.

- They extend to about _____ below the surface.
- Surface currents can move as fast as _____ per day.

What 3 Things Drives Surface Currents?

1. _____ the sun heats the water along the equator. This causes the water to expand. The water along the equator is about 8 cm higher than in the middle latitudes. This causes a slight rise, and water wants to flow down that rise.

2. _____ - the friction of the wind blowing on the water will tend to push the water in the direction the wind is blowing.

3. _____-the Coriolis force turns the currents to the right in the northern hemisphere and to the left in the southern hemisphere

ALL OF THESE FORCES COMBINE TO FORM **CIRCULAR CURRENTS** CALLED _____

What are gyres?

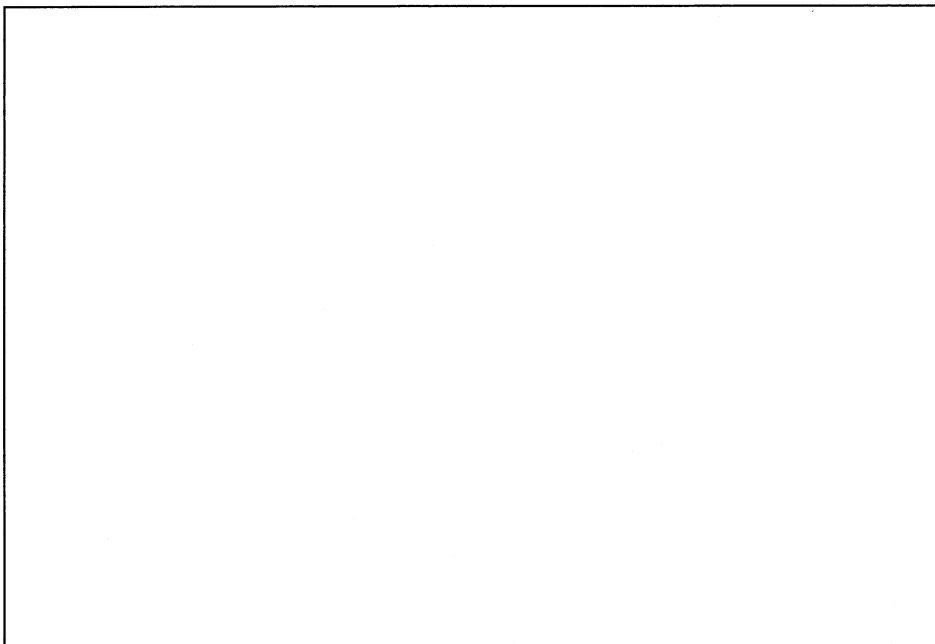
- The currents within each gyre move in the _____ direction
- Gyres in the northern hemisphere circle _____.
- Gyres in the southern hemisphere circle _____.

Example:

The *North Atlantic Gyre* is divided into 4 connected currents:

- 1.
- 2.
- 3.
- 4.

Draw a Diagram of the **North Atlantic Gyre** below: Use red colored pencil to represent a warm current and blue colored pencils for a cold current.



- Upwelling *often occurs along* _____.

Upwelling brings cold, nutrient-rich water from deep in the ocean to the _____.

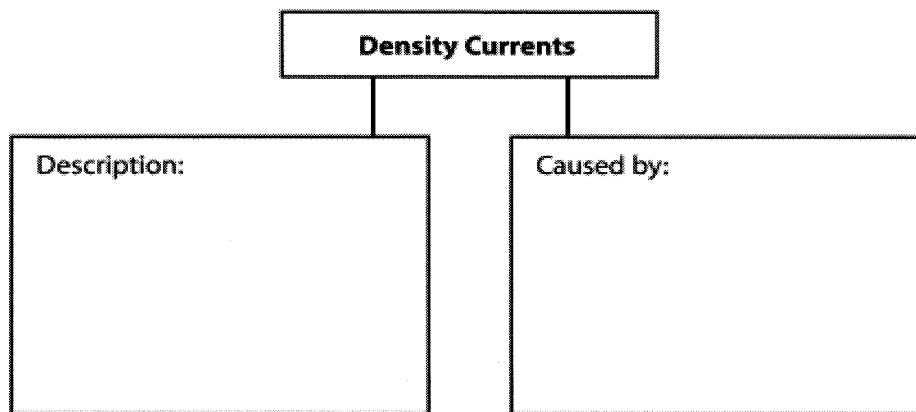
- This water supports large populations of _____, _____, and other ocean organisms.

Which direction do density current move water? _____

Density currents move water _____. They carry water from the _____ into _____ parts of the ocean.

Circle the more dense substance: cold water warm water

Circle the more dense substance: freshwater saltwater



Regions near _____ currents are often cooler and _____.

Regions near _____ currents are often warmer and _____.

The **COLD California Current** affects coastal areas of the **southwestern** United States.

- Cold currents release less _____ and _____ to the air
- Summer evenings along the California coast are often _____ and _____ than evenings in Florida.

The **WARM Gulf Stream** affects coastal areas of the **southeastern** United States.

- Its **warm** currents transfer _____ and _____ to the surrounding air.
- Summer evenings there are often _____ and _____. An evening rain shower is common.

Gyres move in different directions because of the _____.

What is the Coriolis Effect?

The Coriolis Effect is a result of _____.

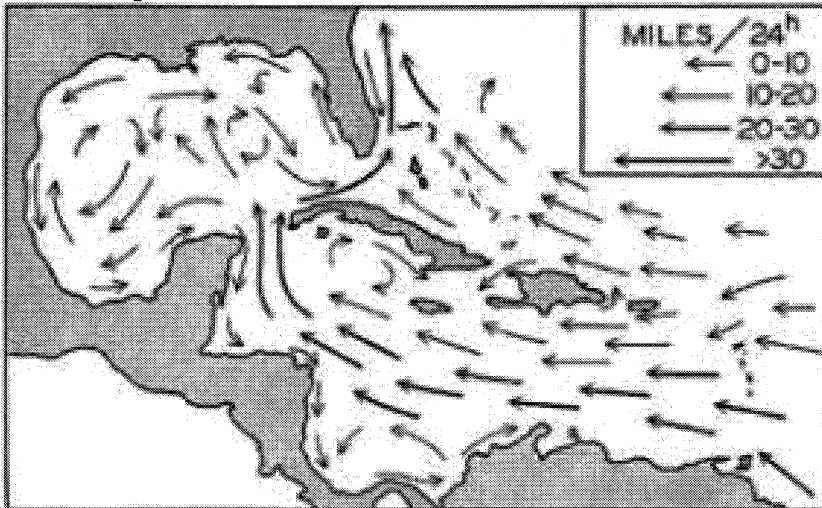
Identify the effect of the Coriolis effect on the movement of surface currents.

Cause	➔	Effect
Coriolis effect		In the southern hemisphere, currents curve to the _____, in a _____ direction.
		In the northern hemisphere, currents curve to the _____, in a _____ direction.

There is NO Coriolis Effect at the _____.

The shapes of continents and other landmasses affect the _____ and _____ of currents

On the map below **circle** where the current would be the **FASTEST**:



WHY is the current the fastest in the area you circled?

What is an upwelling?

Upwelling occurs when wind blows across the ocean's _____ and pushes water _____ from an area.

- Deeper, colder water _____ to the surface to replace it.

Using the Map provided in the PowerPoint, what are some effects of a severe El Nino on the regions listed below:

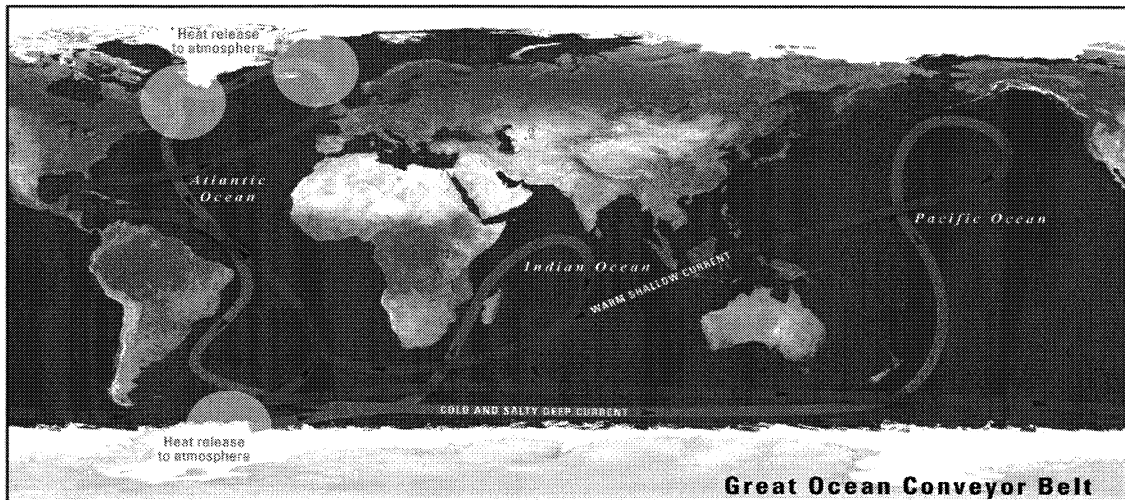
California Coast line: _____ and _____

Gulf Coast of Texas and Florida _____

Galapagos Islands _____ and _____

_____ is the name for a model of the large system of ocean currents that affects weather and climate by circulating thermal energy around Earth.

- In this model, _____ water cools and sinks in the North Atlantic, and deep water returns to the surface in the _____ and _____ Oceans through upwelling



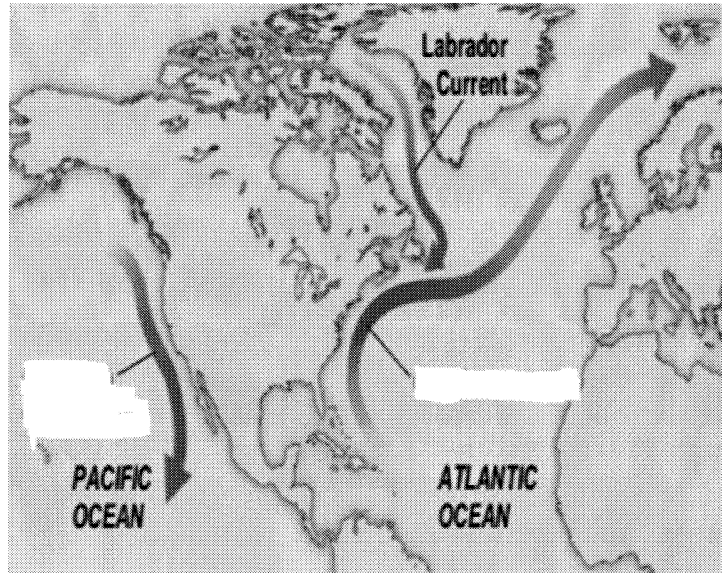
Sequence how the Great Conveyor Belt moves water through the oceans below:

Step 1: Cold, dense water _____ near the poles and travels along the _____.

Step 2: _____ in the Pacific and Indian Oceans bring this cold water to the _____, where it is _____.

Step 3: _____ moves back toward the _____, where the cycle begins again.

Label the California Current and the Gulf Stream Current on the Map Below:



Ocean Currents and Climate – Recap:

- Warm ocean currents _____ at the coast. Humid climate on adjoining _____.
- Cool ocean currents _____ the air at the coast. _____ climate on adjoining landmass

Key Summarize characteristics of the major types of ocean currents. Put an X in the columns that apply.

	Surface Currents	Upwelling Currents	Density Currents
Move water from one place to another			
Move water horizontally			
Move water vertically			
Caused by wind			
Caused by density differences			
Bring nutrient-rich water to the surface			

EXCEPTIONS!

Sometimes shifts in _____ do occur!!!

What is El Nino?

- This happens when the _____ switch direction, causing _____ waters to flow along the _____ coasts and cool waters to flow along the _____ and _____ coasts.