



High School Science Virtual Learning

Earth Science
Ocean Currents

May 12, 2020



High School Earth Science

Lesson: May 12, 2020

Objective/Learning Target:

Students will understand major ocean currents and how they impact Earth.



Let's Get Started:

1. What is the difference between weather and climate?
2. What is an ocean?



Let's Get Started: **Answer Key**

1. **Weather is local & short term, climate is regional and long term**
2. **The ocean is a huge body of saltwater that covers about 71 percent of the Earth's surface**



Lesson Activity:

Directions:

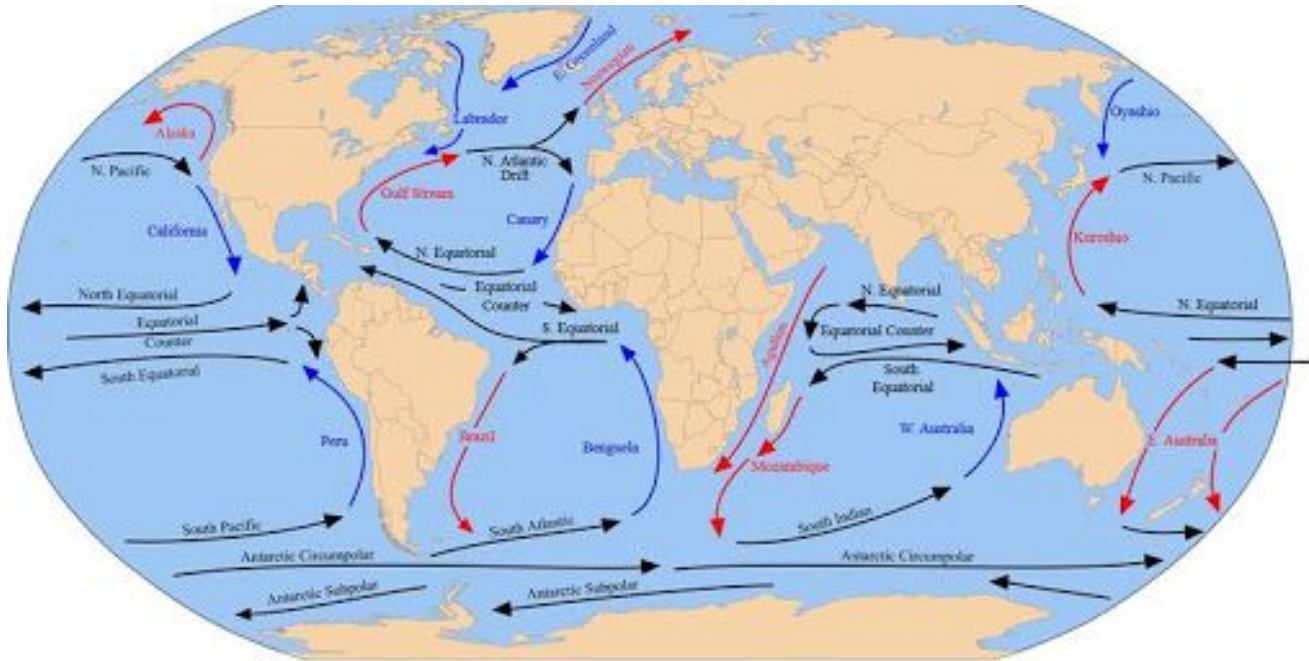
1. Read through the Following slides.
2. Answer the questions on your own paper.

Terms

1. **Coriolis Effect** movement of wind and water to the right or left that is caused by Earth's rotation
2. **upwelling** vertical movement of water toward the ocean's surface
3. **surface current** is an ocean current that moves water horizontally and does not reach a depth of more than 400m.
4. **gyre** is when major surface currents form a circular system.

MAJOR OCEAN CURRENTS

A current is a large volume of water flowing in a certain direction.





CAUSES OF OCEAN CURRENTS

1. One cause of an ocean current is friction between wind and the ocean surface.
 - Earth's prevailing winds influence the formation and direction of surface currents.
 - Ex: tides, waves
2. In addition to the wind, the direction surface currents flow depends on the Coriolis effect.
 - The Coriolis effect results from Earth's rotation. It influences the direction of flow of Earth's water and air.
3. The topography of nearby land can affect the direction and speed of currents.

MAJOR OCEAN CURRENTS

4. Upwelling- Sometimes ocean currents have vertical movement, which is called upwelling. This vertical movement brings up water that is cold and holds many nutrients
5. Density currents are caused by differences in temperature or salinity, not winds.
 - a. Density increases with decreased temperature or increased salinity.
 - b. Water that is dense sinks. Deeper water upwells, bringing nutrients and gases with it.



Practice

Complete the following questions using the information you learned during the lesson activity.

Questions:

1. What is an ocean current?
2. Draw a map of ocean currents (see slide above for an example).
3. What are five causes of ocean currents?
4. What is a gyre?

Once you have completed the practice questions check with the **answer** key.

1. An ocean current is a large volume of salt water flowing in a certain direction.
2. A sample drawing is found in the slides above.
3. Friction from wind, Coriolis effect, topography, upwelling, density
4. A gyre is when surface currents form a circular system (like a giant whirlpool)



More Practice:

Directions:

1. Read through the Following slides.
2. Answer the questions on your own paper.



IMPACT ON WEATHER & CLIMATE

1. Ocean currents affect climate because they carry moisture and thermal energy.
 - a. Coastal areas near a warm-water current are warmer and wetter than regions farther inland.
 - b. Coastal areas near a cold-water current are cooler and drier than regions farther inland.

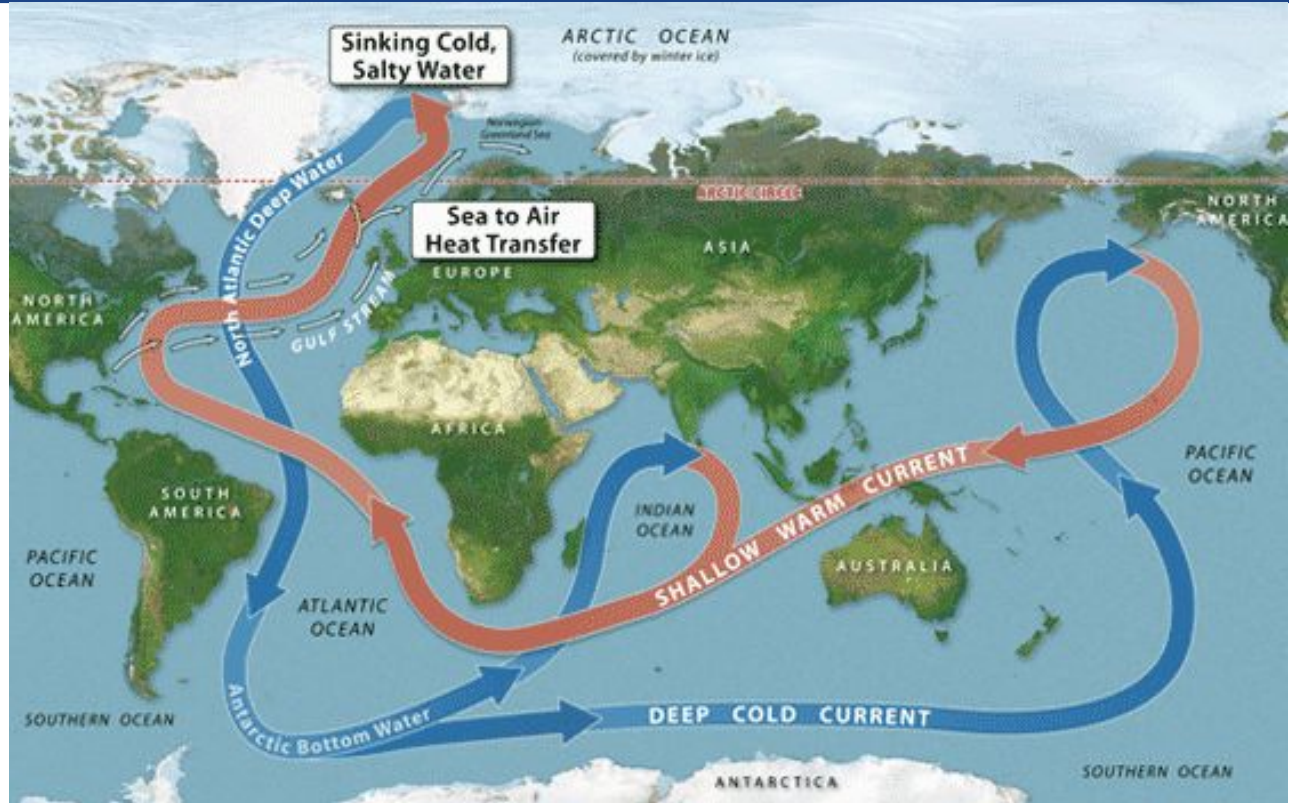
2. Scientists use a model called the Great Ocean Conveyor Belt to describe how currents carry energy through Earth's oceans.
 - a. Density currents in the North Atlantic Ocean and the Southern Ocean drive the water and energy in this model.
 - b. The model explains how cold, dense water sinks, upwelling occurs, sunlight warms surface water, and then this warm water cools.
- See picture on next slide

IMPACT ON WEATHER & CLIMATE

Great Ocean
Conveyor Belt

Also known as

Global Ocean
Conveyor Belt





Questions:

1. How do ocean currents affect weather and climate?
2. Draw the great ocean conveyor belt.



Once you have completed the practice questions check with the **answer** key.

1. Warm ocean currents cause wet climates, cold ocean currents cause dry climates.
2. See sample image in slides above



Additional Resources:

Click on the link below for additional resources.

[Ocean Currents](#)

[Great Ocean Conveyor Belt](#)