

<p>Learning Objective: Ocean Currents</p>
<p>NGSS Standards: MS-ESS2.C-2: Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents.</p>
<p>Objective: Students will be able to:</p> <ol style="list-style-type: none"> 1. Map general flow of global ocean currents. 2. Explain how temperature and salinity affect water movement
<p>Time Required: 60 minutes</p>
<p>Materials Needed:</p> <ul style="list-style-type: none"> • 1 computer/laptop/iPad per student with internet access • 1 teacher computer and projector with internet access for teacher • Red hot water • Blue dyed ice cubes • Plastic or Glass tub full of water • Ocean Currents Handout (attached) • Optional: Colored Pencils
<p>Teacher Preparation:</p> <ul style="list-style-type: none"> • Create Playlist 1, a 20 minute playlist in Legends of Learning using the following game found in the Ocean Currents Learning Objective: <ul style="list-style-type: none"> ◦ <i>Ocean's Booty</i> • Create Playlist 2, a 16 minute playlist in Legends of Learning using the following games found in the Ocean Currents Learning Objective: <ul style="list-style-type: none"> ◦ <i>Round and the Ocean</i> ◦ 5 question assessment after the game • Copy Ocean Currents handout (attached)
<p>Engage (10 mins):</p> <ol style="list-style-type: none"> 1. Take out the clear plastic tub filled with room temperature water. 2. Add the hot red water and blue ice cubes to the system and have students make notes of their observations on the Ocean Currents handout. 3. Discuss students' observations and the ways in which temperature and salinity affects the density of water.
<p>Explore (20 minutes):</p> <ol style="list-style-type: none"> 1. Have your students sign in to Legends of Learning and enter your teacher code. 2. Launch Playlist 1 to your students. 3. When finished with the game, students should answer the 'Big Understandings' questions at the bottom of the handout.
<p>Explain (7 minutes):</p>



1. On the Smartboard/projector, watch the NOAA video on ocean currents:
<https://oceanservice.noaa.gov/facts/current.html>
2. Then pull up the following image.
<https://www.jpl.nasa.gov/images/earth/20100325/atlantic20100325-full.jpg> Have students map out the “Global Ocean Conveyor Belt” that shows the general trend of water movement around the globe.

Elaborate (3 minutes):

1. Do a think-pair-share to go over the “Big Understandings” on the handout.

Evaluate (20 minutes):

1. Have your students [sign in to Legends of Learning and enter your teacher code](#).
2. [Launch](#) Playlist 2 to your students.
3. Use progress on *Round and the Ocean* and five questions to assess student understanding the water cycle.
4. Assist students as needed during game play, pause playlist if you need to address content or questions to entire class.

Name: _____ Date: _____

Colored Water Demonstration

* Using colored pencils, draw what you observed in the colored water demonstration. Include colored arrows that indicate any movement of the different colored water that you observed.

Global Ocean Conveyor Belt

* Using colored pencils, map out the global ocean conveyor belt.



Big Understandings

1. What are the two factors that affect the density of ocean water?

2. What effect does wind have on currents?

3. What effect does the coriolis effect have on currents?
