Lesson Topic: Ocean Currents

Objective:
Students will be able to:

1. Map general flow of global ocean currents.
2. Explain how temperature and salinity affect water movement

Time Required: 60 minutes

Materials Needed:

- 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

Teacher Preparation:

- Assign a Legends of Learning Instructional Quick Play playlist for the day(s) you will be teaching the lesson.
    - Instructional - Middle School - Ocean Currents
- Assign a Legends of Learning Content Review Quick Play playlist for the day(s) you will be teaching the lesson.
    - Content Review - Middle School - Ocean Currents
- Copy Ocean Currents handout (attached)

Engage (10 mins):

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.

Explore (20 minutes):

1. Have your students sign in to Legends of Learning. Instruct students to complete the Instructional playlist.
2. When finished with the game, students should answer the 'Big Understandings' questions at the bottom of the handout.

Explain (7 minutes):

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. Instruct students to complete the Content Review playlist.
2. Analyze student results to determine what concepts need to be a focus for reteaching.
3. Assist students as needed during game play, pause playlist if you need to address content or questions to the entire class.

Additional Lesson Strategies:

- To use Legends for additional instruction, create a custom playlist with an instructional game and pre and post assessment.
- To use Legends for a quick formative assessment, create a 5-question assessment in a playlist.
- To use Legends for a student-directed experience, create a targeted freeplay playlist.
- Encourage students to play on their own at home in Legends of Learning: Awakening for a student-driven experience including avatars, battling, and quests all centered around topics they are covering in 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?

   _____

   _____