



Toxicologist: Unequal Heating of the Earth

NGSS Standard: MS-ESS2-6



Adventure Description:

In this adventure, you will think like a toxicologist and create a YouTube video to teach kids about how warming ocean waters affect marine organisms.

Activity

Step One: Background Information on Toxicologists and YouTube Videos (5 minutes)

- Show [Video: Unequal Heating of the Earth](#)
- As a class, review how toxicologists are scientists who study harmful chemicals. Chemicals are substances that are found in every day life. Some of these chemicals, such as venom from venomous animals, are harmful to people. Toxicologists study these chemicals to learn more about them and help keep people safe from the chemicals.
- Next, explain that some toxicologists study venomous marine organisms. Show [Handout: Examples of Venomous Marine Animals](#). Discuss the different organisms with the class.
- Ask students why they think it is important for toxicologists to study marine organisms.
 - Explain to students that the ocean is a place that many people like to visit and enjoy. Imagine being on vacation and being bitten by a venomous coral reef snake! That would definitely end the fun of being on vacation. Toxicologists want to make sure people know what to do in the case of a bite or sting from a venomous ocean animal.
- Explain to students that toxicologists have been concerned about the effects of warming ocean waters on venomous ocean animals. Most marine animals are adapted to living in a particular environment. These animals are adapted to the temperature of the water, the amount of sunlight, and the type of food in the environment.
- Tell students that if any of those things change, it can cause stress on the animal. This can cause the animal to move to different areas of the ocean to avoid the change. If these animals move closer to beaches where people swim or surf, it can lead to higher numbers of interactions with these animals, like bites and stings! Tell students these changes in ocean temperature can happen because of ocean currents. Show [Handout: Currents](#).
- Explain to students that toxicologists often create Youtube videos that teach people about a certain topic. Ask students to brainstorm reasons why toxicologists would use Youtube videos to teach people about a certain topic.
 - Youtube videos can reach all over the world!
 - Youtube videos are easy to share and watch.

Please contact Allison Bischoff, Director of Customer Service, at allison@rozzylearningcompany.com or 314-272-2560 with questions.

Toxicologist: Unequal Heating of the Earth

- Tell students that today, they will think like toxicologists and create Youtube videos to teach people about how warmer ocean waters are affecting marine organisms.

Step Two: Creating a Current Model (15-20 minutes)

- Explain to students that they will first create a model to use in their video. Their model will be used to show how currents affect ocean animals.
- Divide students into pairs or small groups.
- Provide students with [Handout: Steps to Make a YouTube Video](#). Walk through the steps together as a class.
- Provide students with a marker for marking the map on the handout.
- Have students complete Step 1 on the handout.

Step Three: Writing a Youtube Script (15-20 minutes)

- Explain to students that they will now write a script for their YouTube videos.
- Have students complete Step 2 on the handout.
- While students are working, ask them the following questions:
 - What do people need to know about how water and air determine climate?
 - What do people need to know about your model?
 - Are you going to use a humorous tone, or a more serious tone in your video?
- Teacher Note: Students can practice their scripts if they finish before other students.

Step Four: Recording a Youtube Video (10 minutes)

- Explain to students that they will now record their Youtube videos.
- Provide students with a smartphone, tablet, or other recording device so that they can record their videos.
- Have students complete Step 3 on the handout.
- Teacher Note: We suggest creating a private Youtube channel so family members and students from the classes can watch the videos. You can also host a “viewing party,” so students from other classes can come with the videos in your classroom!

Step Five: Discussion (5 minutes)

- Have students show their current model and discuss their favorite parts of their Youtube videos. Have a “viewing party” and watch each group’s video together as a class.

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Toxicologist: Unequal Heating of the Earth

- Have a concluding class discussion about how the Earth is unequally heated, like a globe with a flashlight shined on it. The light does not reach all parts of the globe at once, much like how only part of Earth is heated at once. This unequal heating creates wind and water currents, which distribute warm and cold air all over the world. This movement of warm and cold air is also what determines the climate of a location. Locations with warm air and warm water currents have a warm climate, and locations with cool air and cool water currents have a cool climate.

Materials List

Provided online:

- Video: Unequal Heating of the Earth
- Handout: Examples of Venomous Marine Animals
- Handout: Currents
- Handout: Steps to Make a YouTube Video

Not Provided (Each student or group needs):

- Smartphone, tablet, or other recording device
- Markers

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