

# Climate Science in a Nutshell

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## TEACHER RESOURCE GUIDE

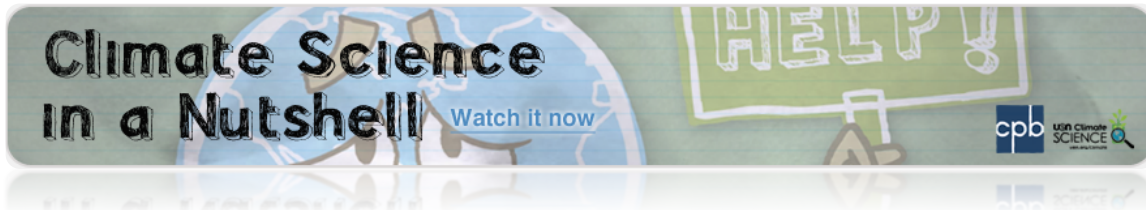
### EPISODE 8: RAPID CLIMATE CHANGE AND THE OCEANS

#### Brief Description

Oceans cover about 70 percent of the planet, and they are bursting with life. At least 230,000 species live here, but our oceans are deep and truly massive, and scientists suspect there could be ten times that amount. Life on land is dependent on the oceans, too. Water that evaporates from the oceans is the largest source of rainfall on the planet, and their gigantic, swirling currents of warm and cold water drive many of the climate and wind patterns that affect life on land. And of course, people depend on the oceans as a vital source of food.

#### Keywords/Key Concepts

Oceans	A large, deep body of salt water.
Carbon Dioxide	A gas that is produced by all animals and plants during respiration and used by plants during photosynthesis. Carbon dioxide is also the by-product of burning fossil fuels.
Climate	A region of the earth having specified climatic conditions, the average course or condition of the weather over a period of years.
Evaporate	Turn from liquid into vapor.
Habitat	The natural home or environment of an animal, plant, or other organism.
Melt	To change from a solid to a liquid.
Oxygen	A colorless, odorless gas. Oxygen forms about 20 percent of the earth's atmosphere.



## TEACHING IDEAS WHEN USING VIDEO IN THE CLASSROOM

While watching television is often seen as a passive viewing experience, there are ways to turn it into a springboard for student interaction. Here are some general teaching strategies that enhance the use of video materials in your classroom by targeting specific skill sets.

- **Predicting**
- **Viewing Comprehension**
- **Listening Practice**
- **Speaking Practice**
- **Discussion**

### PREDICTING

*With picture and audio on:*

- Use the pause control to stop a scene and have students predict what will happen next.
- Use the pause control to stop after a particular line of dialogue and have students predict the next line.

*With audio off:*

- Have students predict the situation and characterizations based on viewing an entire scene without the sound.
- Have students predict lines of dialogue after viewing an entire scene without the sound.
- Have students predict individual lines of dialogue by using the pause button to stop the scene.

*With picture off:*

- Have students predict the situation and characterizations by listening to the soundtrack without watching the picture.

**VIEWING COMPREHENSION.** You can check students' understanding of the situation in the following ways:

*Before watching:*

- Give students specific things to look and listen for before they watch a scene.

*While watching:*

- Freeze-frame the scene by using the pause button and check students' understanding

*While watching or after watching:*

- Have students answer comprehension questions you devise.

*After watching:*

- Give students cloze scripts and have them fill in missing words in dialog lines.

**LISTENING PRACTICE.** Have students focus on the dialogue contained in a scene by listening for particular vocabulary words, structures, or functional expressions:

*TV Dictation:*

- Have students write dialogue lines as they view them, using the pause control to stop the scene after each line.

*Cloze Scripts:*

- As students view a scene, have them fill in missing words in a cloze script you have created.

## **SPEAKING PRACTICE**

*Role Plays:*

- Have students role play a scene, practicing the lines of dialogue for correct intonation and emphasis.

*On-Location Interviews:*

- Have students circulate around the classroom and interview each other using questions contained in the video segment. Students can then report to the class about their interviews.

*Information Gap:*

- Have half the class see a segment without audio and the other half hear it without the picture. Students from each half of the class then pair up, talk about the situation and characters, and act out the scene.

*Strip Dialogue Scenes:*

- Write dialogue lines on separate strips of paper, distribute them randomly, and have students recreate the scene by putting the lines together.

**DISCUSSION**

- Have students discuss the scene, plot and characters' actions, thoughts, and feelings.
- Have students think about what the characters in the scene are thinking but not saying. Students can create these interior monologues, present them to the class, and discuss any varying opinions about characters' inner thoughts during the scene.
- Have students tell which characters they identify with and explain why.

Adapted from *Side by Side TV Reference Guide*.



## Episode 8: Climate Change in the Oceans

Oceans cover about 70 percent of the planet, and they are bursting with life. At least 230,000 species live here, but our oceans are deep and truly massive, and scientists suspect there could be ten times that amount.

Life on land is dependent on the oceans, too. Water that evaporates from the oceans is the largest source of rainfall on the planet, and their gigantic, swirling currents of warm and cold water drive many of the climate and wind patterns that affect life on land. And of course, people depend on the oceans as a vital source of food.

Oceans also do us a tremendous favor by absorbing extra carbon dioxide from the air. Starting about 200 years ago, oceans have absorbed around 118 billion tons of the extra carbon dioxide humans have released into the atmosphere. But just as there's too much carbon dioxide in the atmosphere, there's now too much in the oceans, too.

Carbon dioxide reacts with sea water to create something called carbonic acid, and acid is not a good thing for life in the sea. Rising acidity threatens plankton, sea urchins, squid, shellfish, coral, and other organisms -- all vital parts of the undersea food chain.

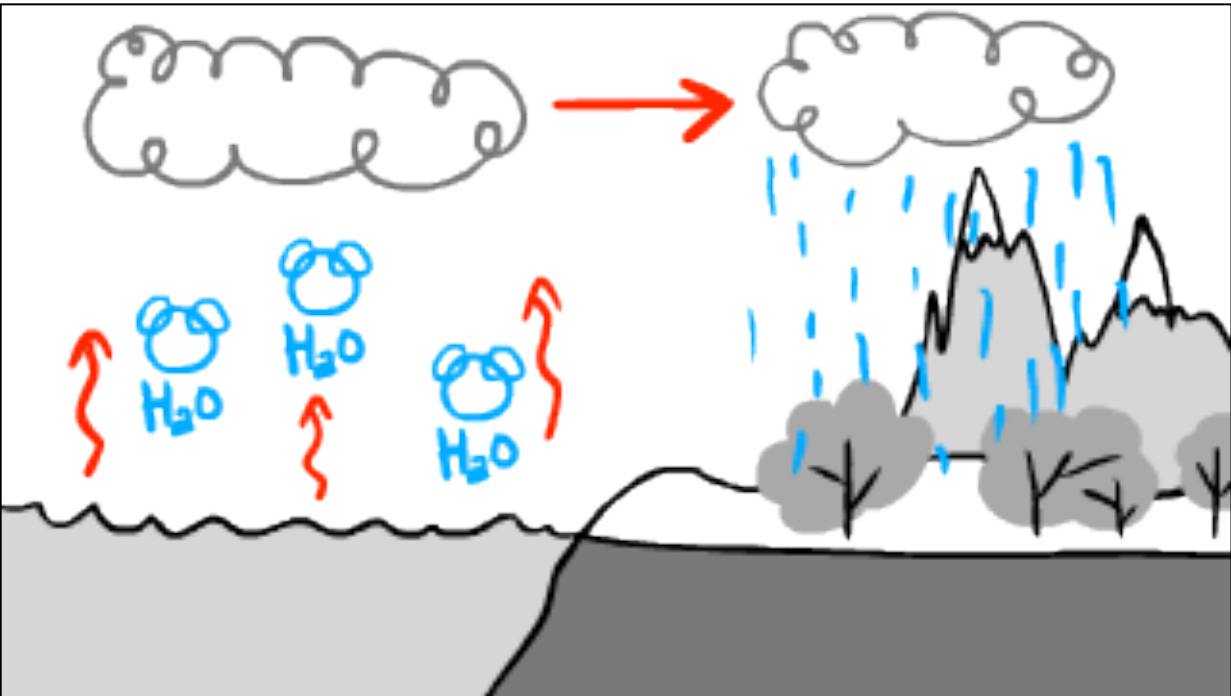
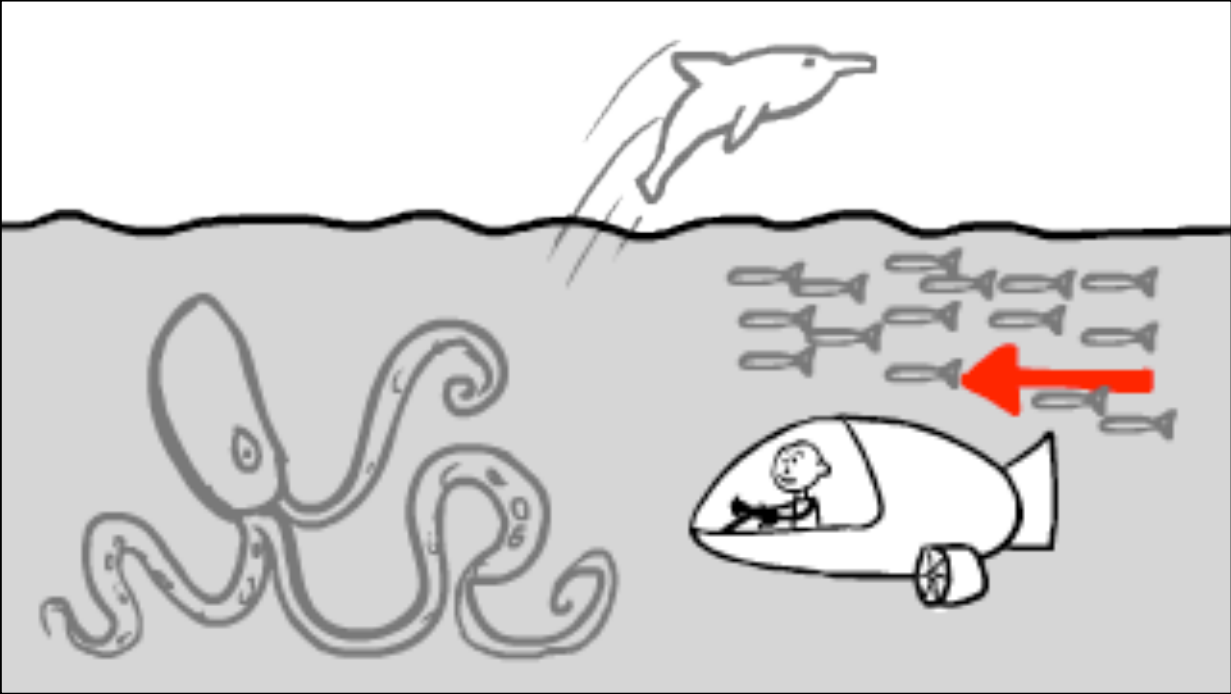
Take the case of coral. Acid makes it much harder for coral to create their outer, hard mineral skeletons. This is a big part of why coral reefs around the world are steadily dying off. That's bad news not just for coral, but also for all the creatures, great and small, that live in and around the reefs. Scientists predict that if rapid climate change is allowed to continue at the current rate, coral reefs could be gone for good by 2050. Remember, everything in nature is connected; losing coral means losing one of the Earth's biggest habitats.

Acid isn't the only problem in our oceans. Just as the air is warming, the water is warming, too. That's not good, because oxygen doesn't dissolve in warm

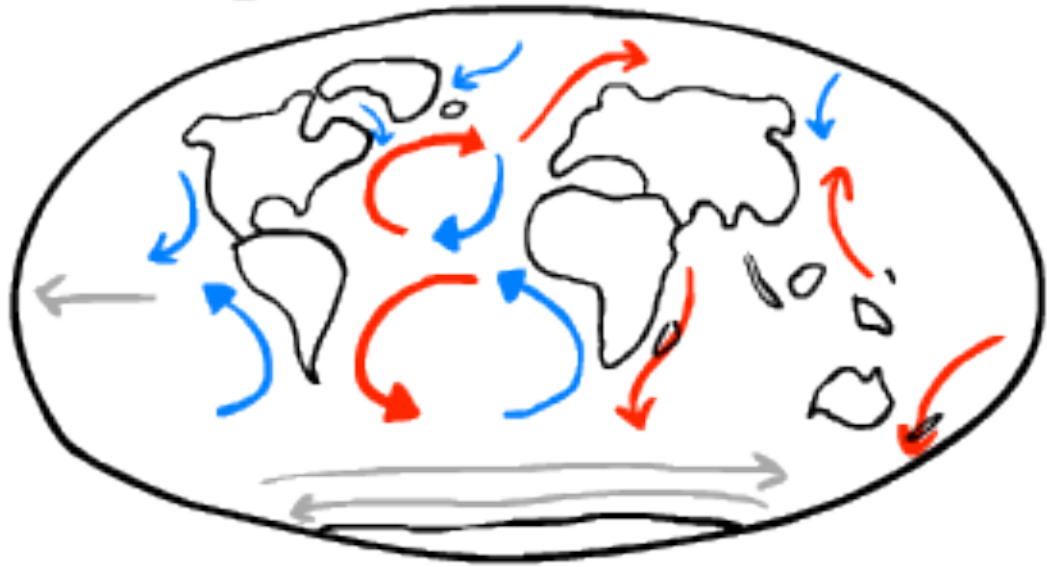
water as well as it does in cooler water. And just like living things on land, most life in the oceans depends on plentiful oxygen. Scientists have discovered large regions where oxygen levels have gotten too low, creating undersea deserts where life was once abundant.

A warmer ocean is also a bigger ocean. That's because water expands when it gets warmer. This, combined with melting ice on land, is causing sea levels to rise. Rising oceans are a threat to coasts, and the people who live near them, around the world.

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