



CALENDAR

06.25.11

[Mass versus Weight Workshop](#)

07.23.11

[Workshop: Space Communications/Sounds](#)

07.27.11

[Earth Science Workshop](#)

› [Full Calendar](#)

Water Balloon Activity Illustrates Warming Oceans



NASA/JPL

oceanographer Josh Willis, on the right, uses a water balloon to demonstrate how Earth's oceans are absorbing most of the heat being trapped in our warming world. Image credit: NASA/JPL [Go to video demo](#)

July 29, 2010

NASA's Summer of Innovation program is focusing on summer learning that doesn't have to occur in the classroom. Here is a demonstration that is sure to catch students' attention, whether they are at a summer camp or in school. This activity uses a water balloon to show how Earth's oceans are absorbing most of the heat being trapped on our warming world. However, since the demonstration requires lighting a balloon, adults must perform the activity and wear safety goggles. Students must not do the demonstration themselves.

For a more detailed discussion about climate change, and a video demo of this activity, watch our Oceans of Climate Change video (<http://www.jpl.nasa.gov/video/index.cfm?id=827>)

Materials:

Several balloons

Lighter (Please note: We use the older lighters that have a flame, not the newer lighters that make a small jet.)

Bottle of water

Bucket

Safety goggles

Instructions:

1. Blow up the balloon and tie it. Ask someone to hold the balloon while you put on safety goggles. Explain to students that the air-filled balloon represents Earth's atmosphere and the flame represents the heat from the sun.
2. Take the balloon and have students stand at least three feet away from you.
3. Hold the bottom of the balloon. Place the lighter's flame onto the balloon but at a safe distance from where you are holding the balloon. As soon as the flame touches the balloon, the balloon will pop.
4. Now make a water balloon. When filling the balloon, try to remove any air bubbles as placing the flame over an air bubble could cause the balloon to pop prematurely. Explain to students that this balloon represents Earth's oceans.
5. Make sure your safety goggles are still on and hold the balloon over the bucket. Make sure to hold the balloon at the bottom and place the lighter's flame on the balloon, at a safe distance from where you are holding the balloon.
6. Depending on the size of the balloon, the quality and thickness of the rubber, and the presence of any air bubbles, the water-filled balloon should last more than one minute with the flame on it. Be sure to follow any safety instructions on the lighter with regard to how long the lighter may be held lit without cooling off.
7. Eventually it may pop so position the bucket to catch the water.
8. Explain to students that this demonstration illustrates how Earth's oceans are absorbing a great deal of the heat generated by climate change. In fact, Earth's oceans are absorbing about 80 to 90 percent of the heat from global warming. Since water can withstand a lot more heat than the atmosphere, the temperature of the oceans isn't changing that much.

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