Ocean Acidification
American Spaces Student Worksheet
by the Smithsonian Ocean Portal

Ocean acidification is a significant and harmful consequence of excess carbon dioxide in the atmosphere that we don't see or feel because its effects are happening underwater. Around one-third of the carbon dioxide (CO_2) released by burning coal, oil and gas doesn't stay in the air, but instead dissolves into the ocean. In the past 200 years alone, ocean water has become 30 percent more acidic—faster than any known change in ocean chemistry in the last 50 million years.

This relatively quick change doesn't give marine life much time to adapt. In fact, the shells of some animals are already dissolving in the more acidic seawater, and that's just one way that acidification may affect ocean life. Some organisms will survive or even thrive under the more acidic conditions but many others will struggle to adapt, and some may even go extinct. These impacts will spread far beyond the sea. Beyond lost biodiversity, acidification will affect fisheries and aquaculture, threatening food security for millions of people, as well as tourism and other sea-related economies.

Objectives:
- Explain ocean acidification.
- Explain how ocean acidification will affect marine animals.
- Explain how ocean acidification will affect people

Read as far as you can through the Ocean Acidification topic page (http://ocean.si.edu/ocean-acidification). Write down answers individually or in small groups, and then go over the following questions as a group.

ANSWER KEY:

1. Define carbon dioxide, including how it causes global warming and ocean acidification.

2. How has the ocean's pH changed since the industrial revolution? How much is it expected to change by the end of the century?

3. That doesn't seem like a very big drop in pH. Why does a small change in pH and acidity matter?

4. Name two threats to corals from ocean acidification.

5. How is ocean acidification expected to affect plants?

6. Name three ways you can help to slow ocean acidification and climate change.

VOCABULARY SCAVENGER HUNT:

1. Define "pteropod"

2. Define "pH scale"

Additional Reading and Media:

Ocean Acidification with Dr. Francisco Chavez (video):http://ocean.si.edu//ocean-videos/ocean-acidification-dr-francisco-chavez

Researcher-written blog post about ocean acidification may speed up some predators of shelled organisms: http://ocean.si.edu//blog/ocean-acidification-excites-boring-sponges

Smithsonian scientist-written blog post about her work studying acidification at carbon dioxide seeps in Papua New Guinea: http://ocean.si.edu/blog/sneak-peek-future-coral-reefs-acidifying-ocean

Article on why it's hard to study ocean acidification: http://ocean.si.edu/ocean-news/searching-ocean-acidification-signal

Video acidification's effects on people and industries: http://bcove.me/6ntxr4qy