Climate Change
American Spaces Activity Guide
By the Smithsonian Ocean Portal

With over seven billion people, the impact of our collective actions on planet Earth is huge. Coal, oil and natural gas (all fossil fuels that produce carbon dioxide when burned) fuel almost everything that we do: driving cars, flying in planes, and using electricity to power our lights and our electronics and heat and cool our buildings. When carbon dioxide and other "greenhouse" gases are released into the atmosphere, they trap the heat from the sun and warm the entire planet, both the atmosphere and the ocean. The consequences of this warming are far-flung and not totally understood, but include changes in weather patterns, rising seas, and much more. Carbon dioxide also dissolves into the ocean, making it more acidic. Many of these impacts will be long-lasting as carbon dioxide stays in the atmosphere for centuries.

The situation is not hopeless, however, and people are increasingly aware that we need to do something in order to prevent catastrophic changes. There are ways that humans can change in order to release less carbon dioxide into the atmosphere, including making use of renewable energy sources like the wind and the sun. Other actions can reduce the harm that is done by climate change.

Objectives:
-Understand that climate change is man made
-Understand the mechanisms of climate change
-Understand how impacts of climate change can be mitigated, reversed or changed

Read as far as you can through the Climate Change topic page (http://ocean.si.edu/climate-change) (or print out the PDF) and use it to answer the following questions.

1. Why are carbon dioxide levels higher than they've been in 15 million years?

2. How do scientists know about the Earth's past climate and carbon dioxide (CO_2) levels?

3. What is a consequence of carbon dioxide dissolving into seawater?

4. Why will climate change cause the sea level to rise?

5. What are some of the ripple effects of climate change on animals and ecosystems?

VOCABULARY SCAVENGER HUNT:

1. Define “greenhouse effect”:

2. Define "foraminifera:"

Additional Reading and Media

Climate change as a game of tetris: http://ocean.si.edu/ocean-videos/climate-change-game-tetris

Video on climate change impacts on glaciers and ice sheets: http://ocean.si.edu/ocean-videos/how-will-climate-change-affect-glaciers-and-ice-sheets

Climate change at the poles: http://ocean.si.edu/ocean-news/climate-change-poles

Why Melting Glaciers Matter to the Coasts [Video]: https://www.youtube.com/watch?v=lDZWWcAfn-c

Warming, Rising Acidity and Pollution: Top Threats to the Ocean http://www.smithsonianmag.com/science-nature/warming-rising-acidity-and-pollution-top-threats-to-the-ocean-96751835/