Plants take in the CO$_2$ that we breathe out

Plants give off the oxygen that we breathe in

Carbon travels through a cycle

Parts of the cycle are being affected by **US**

We are causing more CO$_2$ to be in the atmosphere
The energy from the sun allows plants to produce oxygen (O₂) from CO₂ and water (H₂O).

A kelp forest

http://marinebio.org/Oceans/TheForests/
What happens during photosynthesis is expressed in the following chemical equation:

\[ 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \]

Now we’re going to have an activity demonstrating how these atoms react during this process and see what they produce.
Respiration is the opposite of photosynthesis:

\[ 6O_2 + C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O + \text{energy} \]

In respiration, living organisms, including people, take in the oxygen and sugar produced by plants and give off CO\(_2\).
Plants live on land and in the ocean. Most plants in the ocean are too small to see with our eyes. Both land and ocean plants are important.

We need plants to make oxygen!!!
We get almost as much oxygen from plants (algae) in the ocean as we do from plants on land!
The Carbon Cycle as described in “Kid’s Crossing” states:

“All living things are made of carbon. Carbon is also a part of the ocean, air, and even rocks. Because the Earth is a dynamic place, carbon does not stay still. It is on the move!”

http://eo.ucar.edu/kids/green/cycles6.htm &
Plants use carbon dioxide and sunlight to produce oxygen and make their own food for growth. The carbon becomes part of the plant. As plants die, they can sink and may be buried.

Click on the picture for an animation of the carbon cycle in the ocean...

http://eo.ucar.edu/kids/green/cycles6.htm
http://earthobservatory.nasa.gov/LibraryPHYtoplankton/
Over millions of years, the buried plants can become fossil fuels such as oil and gas.

When humans burn fossil fuels, most of the carbon goes into the atmosphere as carbon dioxide. Humans have burned so much fuel that there is about 17% more carbon dioxide in the air today than there was about 50 years ago.

Carbon dioxide is a greenhouse gas and traps heat (infrared radiation) in the atmosphere. Without carbon dioxide and other greenhouse gases, Earth would be much colder.

http://eo.ucar.edu/kids/green/cycles6.htm

http://www.tufts.edu/tie/tci/ClimateChange.html
We know that carbon dioxide levels in the atmosphere are increasing based on long term measurements since 1957 and even before that by looking at bubbles trapped in ice core samples. In fact, ice cores show us that there is now more carbon dioxide in the atmosphere than there has been in the last 650,000 years!!!
There is growing concern that increasing levels of carbon dioxide will alter the Earth’s climate in ways that are not yet fully understood.
In addition to fossil fuel burning, there are other things that happen on our planet to increase the level of carbon dioxide in our atmosphere.


http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissionsUSEmissionsInventory2006.html
Let's make a graph to see how much carbon dioxide in the atmosphere has increased over the years!

The top row tells the years and the bottom row tells the amount of carbon dioxide measure of the air in parts per million.
Hopefully, your graph looks something like this!
The increasing carbon dioxide can lead to ocean acidification.

Ocean acidification can harm marine organisms.

Eventually, the ocean will absorb the excess CO$_2$ through buffering action of carbonate minerals, but this will take a very long time (longer than about $10^5$ yr).
Societal impacts can occur due to too much carbon dioxide. For example:

- Impacts on food and water supplies
- Increasing risk of severe weather and flooding
- Changes in agricultural practices
Humans will need to work to reduce emissions of carbon dioxide and look for ways to adapt to changes in climate that are likely to occur because of the increasing levels of carbon dioxide.
• Reduce your carbon footprint
http://www.worldwildlife.org/climate/item3797.html

• Reduce your contribution to greenhouse gas emissions
http://epa.gov/climatechange/wycd/index.html

• Remember that YOU have “The Power One”
http://www.oneearth.org/