

Here is some important information about carbon dioxide, carbon footprints and how to reduce your impact.

What is carbon dioxide? Where does it come from?

Carbon dioxide is produced when fossil fuels like oil, coal, and gas are burned to get energy. When you flip on the light, microwave popcorn, do a load of laundry or drive to school, you are engaging in activities that essentially create carbon dioxide. Clearly we can't avoid all activities that require energy, but we can aim to reduce our emissions and find a sustainable balance. Encouraging projects that make energy production cleaner like wind and solar energy helps reduce emissions. Trees "breathe" in carbon dioxide, therefore supporting forest conservation and reforestation projects will help reduce the number of harmful emissions in the atmosphere.

Why is carbon dioxide harmful?

The sun's radiation emits energy into the Earth's atmosphere. Some of this energy is absorbed and keeps the earth at livable temperatures but some bounces back into space. Carbon dioxide makes it harder for the energy to escape our atmosphere and the result of more of these "greenhouse gases" in the atmosphere is an overall increase in global temperatures, though the results of this may vary by region. For example an area might have a longer, hotter summer, but another region might 'feel' global climate change with a colder, snowier winter. It's all about balance and the increase of greenhouse gases from the burning of fossil fuels is knocking our system out of balance.

Many elements of society and the environment are sensitive to climate change. Our health, agriculture, the natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems. With climate change all of these systems will be negatively affected. Find out how the region you live in might be affected:

<http://www.epa.gov/climatechange/effects/usregions.html>.

Note that while carbon dioxide isn't the only greenhouse gas that contributes to global climate change (for example: methane releases from a landfill as trash decomposes), but it is widely considered the main concern.

- **Resources for making a change as a student or an educator:**

- The Environmental Protection Agency has a great website all about climate change, designed specifically for kids, including games and animations:
<http://www.epa.gov/climatechange/kids/>
- The Environmental Protection Agency (EPA) has compiled resources for ways students and teachers can engage their community and calculate and reduce the carbon footprint of their schools:
<http://www.epa.gov/climatechange/wycd/school.html>

- Tread Lightly has created a free downloadable Teacher Toolkit which includes 7 lesson plans complete with video links, worksheets and discussion ideas. Also available is a Youth Guide to Action and a 40 day plan for reducing your environmental impact. These are great for students and school environmental clubs: <http://treadlightly.tigweb.org/getinvolved.html>
- The United States Global Change Research Program has created a kit for teachers to implement climate change education on a personal level as it relates to regional wildlife and geography: <http://www.globalchange.gov/resources/educators/toolkit>
- The Woods Hole Research Center is a great source for information on greenhouse gases, climate change causes and impacts. They have a ton of great graphs and visual aids too: http://www.whrc.org/resources/primer_home.html
- The Bonneville Environmental Foundation's "Solar 4R Schools" initiative houses teacher resources for energy education. The site includes projects, activities, multimedia clips, and even a teacher's lounge for idea exchange: <http://www.b-e-f.org/solar4rschools/learn/teachers>
- The Bonneville Environmental Foundation also has a great educational and interactive website. They explore the important carbon and clean water issues today: <http://www.b-e-f.org/carbon/education>, <http://www.b-e-f.org/water/facts>
- The National Energy Education Development Project provides resources for students including fun games and puzzles and ideas for great science projects. Teacher resources include curriculum, energy information and classroom activities: <http://www.need.org/>
- The National Renewable Energy Laboratory compiled information for students on renewable energy including biomass, solar, wind, geothermal and hydrogen energy. http://www.nrel.gov/learning/student_resources.html
- The U.S Department of Energy has created a site for the development of energy education in our schools. The site includes lesson plans on a variety of topics ranging from energy basics to nanotechnology: <http://www1.eere.energy.gov/education/lessonplans/>
- The U.S. Energy Information Administration created a website about energy just for kids! They discuss energy, where it comes from, how we use it and how to

save it, and they provide a bunch of fun games, puzzles and activities:

<http://www.eia.doe.gov/kids/>

- The Wisconsin Department of Natural Resources designed a simple website about global warming aimed at educating kids! The site includes information on greenhouse gases, what might happen in the future, how kids can make a difference and a glossary of climate change words:
<http://dnr.wi.gov/org/caer/ce/ee/earth/air/global.htm>
- The American Wind Energy Association has a portion of their website dedicated to wind energy teaching material, all catered toward each grade level K-12:
<http://www.awea.org/education/curriculum/>
- **Daily ways to reduce emissions:**
 - Switch out old incandescent bulbs with new compact fluorescent bulbs, which use two-thirds less energy. What a bright idea!
 - Turn off lights and appliances when you aren't using them. Leaving a vacant phone charger plugged in, a computer sleeping, or a video game paused means you're using energy all the time when you don't need to be. Switch it off "at the wall".
 - Unplug yourself! Take a hike, climb a tree, swim in a lake. Get outside and enjoy the world you want to save!
 - Put on a sweater instead of turning up the heat in your home. Use fans to circulate air instead of turning your home into an igloo (unless your home really is an igloo!).
 - Take shorter and cooler showers. Not only does it save water and energy but also your hair and skin will thank you.
 - Help out with the laundry and hang it outside on a clothesline to dry on a nice day. You'll save energy and have fresh-smelling, sun-warmed clothes.
 - Recycle. Old notebooks, junk mail, soda cans, milk jugs, tin cans, newspapers, magazines, shampoo bottles... Also find out where you can recycle things like batteries, appliances and car tires locally.
 - Do you need to print that? Think twice about printing when you can just save an electronic copy to your computer. If you must print, double-sided is definitely the way to go.
 - Buy printer paper and notebooks made of post-consumer recycled content.
 - Help out with the laundry and hang it outside on a clothesline to dry on a nice day. You'll save energy and have fresh-smelling, warm sun-dried clothes.
 - Donate things you don't use anymore. Think through a new purchase. Shop at second-hand stores before you go to buy something new. You can give a second chance to some really cool items. What a fashionable environment you are creating!

- Buy a reusable water bottle. You'll stay hydrated and save a bunch of plastic bottles from ending up in a landfill.
- Paper or plastic? Neither – buy a reusable bag! The average American uses over 500 plastic bags a year; imagine if you only used one. Reusing bags is commonplace in many other countries – buy a stylish one and you'll be cultured and environmentally friendly.
- Need to go somewhere? Walk or bike! You'll get some exercise and enjoy your surroundings more. Bike lanes are popping up all over the United States, just be sure to look both ways and wear a helmet.
- Check out the public transit options in your area. City buses and trains often offer student/educator discounts. Saving money and the environment – bonus!
- If you have to drive, drive like your Grandma! Don't speed, don't idle, and smoothly accelerate and brake. The more consistent and smooth your driving is, the more efficiently your car uses gas.
- Plant a vegetable or herb garden: your very own backyard grocery store! Your fresh veggies will taste better and your body will be healthier. You will cut down on car trips to the grocery store and this will cut down on emissions created in the transport of food to your local grocery store.
- Cut down on your red meat consumption. Cattle ranches release an overwhelming amount of methane, another important greenhouse gas, into the atmosphere everyday. That's right, we're talking about cow farts and poop!