Over the past 100 years, Earth has warmed up by about 1 °F, and the 10 hottest years on record have all occurred within the last 15 years. Why did this happen? And is it something to be concerned about?

Scientists believe that part of the reason the Earth is getting warmer is because of the actions of ordinary people. In the last few hundred years, we have dramatically changed our behavior. We’ve invented countless new machines like cars and computers, airplanes and air-conditioning, and all of these inventions run on energy. Most of the energy they use comes from the burning of fuels like coal and oil — known as fossil fuels. The burning of these fossil fuels results in the production of greenhouse gases, and these gases trap the heat of the sun, making the Earth grow warmer.

The effect produced when greenhouse gases trap the heat from the sun is called the greenhouse effect, because the gases act just like the walls of a greenhouse or the closed windows of a car left in the sun. If you’ve ever opened the door of a car parked in the hot sun, you’ve noticed that the air inside the car is much hotter than the air outside. This happens because light and heat from the sun can get inside the car, but closed windows keep the heat from getting out. Greenhouse gases like carbon dioxide, methane and water vapor trap the sun’s heat just like a car’s windows do.

Greenhouse gases in the atmosphere have been increased by massive logging in our forests. Living trees remove carbon dioxide (a greenhouse gas) from the air. Trees that are burned or cut down release carbon dioxide back into the air. Between 1960 and 1990, one fifth of the world’s tropical rainforest was destroyed, and we are now losing at least 50 million acres of rainforest a year. That loss of trees results in a big increase in the carbon dioxide in our air.

But should the warming of the Earth concern us? One problem associated with increased warming is a rise in sea level. As the weather gets warmer, huge sheets of ice called glaciers will melt, and as they melt, they will release water into the oceans. Warmer temperatures will also make the water already in the oceans expand to take up even more space. Sea levels have already risen six to eight inches over the last 100 years, and in the next 100, they could rise by as much as three feet. As sea level rises, people living along coastlines will be affected by increased flooding and accelerated erosion.

Global warming will also have an effect on animals, plants and the crops we grow. If the climate changes as rapidly as some scientists predict, sensitive species may not be able to react quickly enough to survive. Animals like polar bears are already feeling the effects of climate change as sea ice thins and their hunting season shortens.

Global warming may have direct effects on people’s health as well, and climate change could increase the strength of weather events like tornadoes and hurricanes, increasing their force and making them more dangerous.

The good news is that there are steps we can take to help reduce global warming. By doing our part to use less energy, we can cut down on the amount of greenhouse gases we put into the air. Turning off the lights, the TV and the computer when you don’t need them will help and so will taking a walk or riding a bike rather than getting in the car. Planting trees is another step. Each tree absorbs carbon dioxide, and trees also provide shade that can cool your house and cut down on your air-conditioning bill. Recycling newspapers, bottles and cans is another great way to help.

We know enough about global warming and what causes it to start taking action, and the sooner we start, the better our chances of restoring Earth’s balance!
Fun and Games!

Word Scramble

Below are eight words related to global warming. All of the words appear somewhere in the box of key words and concepts below. Unscramble the letters to find out what the words are, and then read the circled letters to find a secret message.

1. NHOGSUEREE  GREENHOUSE
2. FECETF
3. THREAWE
4. NEREGY
5. TACLMIE
6. SILSOF
7. LIO
8. EFLU

SECRET MESSAGE: ______

Climate Quiz

1. Which of the following is a greenhouse gas?
   a. Helium
   b. Oxygen
   c. Carbon dioxide

2. Which item below is a reason for rising sea levels?
   a. Melting glaciers
   b. Fat whales taking up more space
   c. Someone left the hose on

3. Which problem below could be caused by global warming?
   a. Hurricanes become stronger and more dangerous.
   b. Polar bear hunting season is shortened, and the bears can’t find enough food.
   c. Both a and b

4. How can you help reduce production of greenhouse gases?
   a. Watch lots of television
   b. Recycle your bottles and cans
   c. Hold your breath

5. Name something you can ride instead of a car.
   a. Bike
   b. Bus
   c. Horse
   d. All of the above

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Key words and concepts

Weather: Weather is the state of the atmosphere at a given place and time with respect to variables like temperature, moisture and wind speed. Is it raining or snowing? Windy or still? The weather describes the conditions of the moment.

Climate: Climate describes the total of all weather occurring over a number of years in a given place. It includes average weather conditions, regular weather sequences (winter, spring, summer and fall) and special weather events (hurricanes, tornadoes and floods). Climate tells us what it’s usually like where you live. If you live in Seattle, Washington, you have a rainy climate. Las Vegas, Nevada has a hot, dry climate.

Greenhouse gases: A greenhouse gas is any gas that absorbs and retains heat in the atmosphere. Greenhouse gases include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃) and others.

Greenhouse effect: This is the effect produced as greenhouse gases allow incoming solar radiation to pass through the Earth’s atmosphere, but keep most of the heat generated from escaping into outer space.

Fossil fuels: Fossil fuels are energy sources formed in the Earth from plant and animal remains. They include coal, oil and natural gas.

Websites

www.epa.gov/globalwarming/kids
Environmental Protection Agency

www.exploratorium.edu/climate/
Global Climate Change: Research Explorer

tiki.oneworld.net/penguin/
Tiki the penguin explains climate change.

Books

Global Warming
By Peggy J. Parks
ages 9–12

Global Warming: The Threat of Earth’s Changing Climate
By Laurence P. Pringle
ages 9–12

How to Save the Planet
By Barbara Taylor
ages 9–12

TODAY’S PLANET

To explore, enjoy and protect the wild places of the earth; to practice and promote the responsible use of the earth’s ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.
Turn It Off
Whenever you use electricity, you put some greenhouse gases into the air. By turning off lights, the TV and the computer when you’re not using them, you can help a lot!

Write a Letter
Contacting your elected officials to let them know you are concerned about global warming and want them to take action is one very important way to make positive changes.

Plant a Tree
Planting trees is a great way to reduce greenhouse gases. Shade trees around a house will absorb carbon dioxide and cut down on summer air-conditioning bills.

Take a Hike
Whenever possible, skip the car trip and walk, ride a bike or take public transportation to your destination. It’s good exercise, and you’ll cut down on global warming pollution.

Reduce! Reuse! Recycle!
When you recycle, you help save natural resources like trees, and you cut down on energy use and pollution. Recycling a stack of newspapers four feet high will save one tree.

Did you know that if drivers properly inflated their tires we would save more oil in one year than could be taken from the coastal plain of the Arctic Refuge? In 2001, Savannah Walters — just 9 years old at the time — discovered that the United States could save 4 million gallons of gas daily, just by pumping up car tires to their proper inflation levels. Savannah had tire gauges donated for distribution to drivers so they would properly inflate their tires and cut back on wasteful spending and pollution. To find out more about Savannah’s story and how to get involved, visit www.pumpemup.org.

If studying the climate and learning how to predict the weather interests you, you might want to consider a career in meteorology.

Meteorologists use information about temperature, winds, rainfall patterns and other variables gathered using satellites, aircraft, ships and balloons to develop an accurate picture of our climate. They develop computer models that predict how climate and weather may vary in the future, and they carry out the basic research that helps us to understand how the atmosphere works — including why hurricanes and tornadoes form when they do.

Tell us what you’re thinking!
Use this space to write a letter or draw a picture showing your concern for the planet and your ideas for how to help. Then cut on the dotted line and mail it to us! If we print your letter or drawing, you could get a FREE Sierra Club backpack, hat or children’s book. Go ahead — tell the world what’s on your mind!

Name ______________________ Age/Grade ___________ Submissions become property of the Sierra Club and may be used without limitation or restriction.
Saul, 4th Grade

Avery, 6th Grade

Anthony, 5th Grade

Help the Rainforest
Help Your Future

Please Do Not Cut the Rainforest Trees

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