

Climate Change



What is climate?

When we talk about **climate**, the first thing that usually comes to mind is the temperature in an area. Africa typically has a high temperature and therefore, we think of it as having a hot climate. Antarctica is usually cold so it has a cold climate. Climate is BIGGER though. Climate is an area's "average weather", including temperature, precipitation (rain, snow, etc.), humidity, wind and even seasons (What is climate change?, n.d.).

The Earth has been around a long time and its climate has changed a lot. During the time of the dinosaurs, Earth was a much warmer place and just about 10,000 years ago, we finished an ice age. The problem we face now is human-made climate change. What we are doing is changing our climate much faster than Nature intended and that's what's causing the problems.

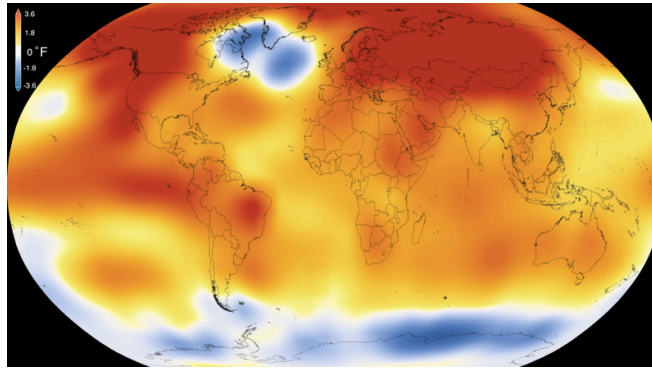
Happy Thought!

It's not too late! By making small changes to our lifestyles, we can lower our carbon dioxide emissions and reduce pollution. If everyone does his or her part, we can stop this.

What's the big deal?

NASA has reported a global average temperature increase of 1.4° Fahrenheit since the 1880s, and stated that nine out of the ten warmest years have happened since the year 2000. These records date back 134-years (Global Climate Change, n.d.).

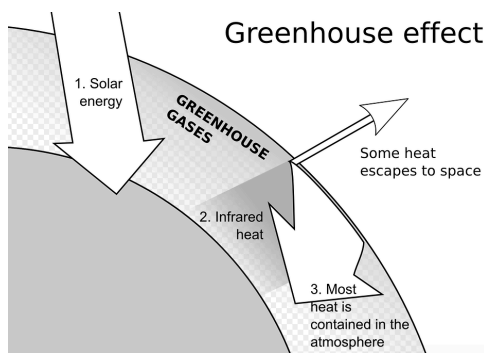
Climate: Climate is an area's "average weather", including temperature, precipitation (rain, snow, etc.), humidity, wind and even seasons



This picture shows temperature changes compared to 1951-1980. Red means hotter, blue is colder – Credit NASA

The Greenhouse Effect

One of the most significant ways we affect our environment is the large amount of greenhouse

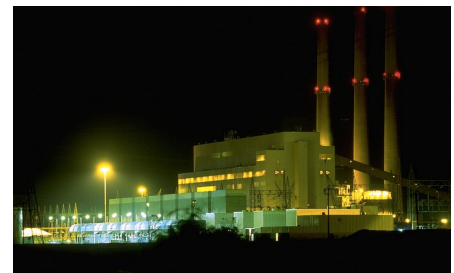


gases we emit, mainly carbon dioxide (CO₂). How does this create global warming and climate change? It all comes down to the greenhouse effect. The greenhouse effect is when the layer of gases in the **atmosphere** absorbs heat from the Earth to keep it warm like a blanket or sweater keeps you warm. The gases that do this (including carbon dioxide) are called **greenhouse gases**.

They are very important, without them, most places on Earth would be too cold to live in. But when there's too many of them, it can cause the surface temperature of the Earth to rise.

What's causing all this carbon dioxide?

The biggest way we create carbon dioxide is by burning **fossil fuels** to make energy to run our cars, light our homes, charge our phones, etc. The level of CO₂ is measured in parts per million (ppm), or how many CO₂ molecules there are in a sample of one million molecules of air. Looking back 400,000 years, the levels never went above 300 ppm. Today they are at 403.28 ppm (Global Climate Change, n.d.).



Fossil Fuel Electricity Generation plant

Fossil fuels – fossil fuels are things like coal, oil, and natural gas that are formed from long-dead plants, animals and other organisms over millions of years.

Atmosphere – the layer of gases surrounding the planet.

Greenhouse gases – gases in the atmosphere that absorb heat from the Earth, keeping it warm.

Why are we so concerned about 1.4°F?

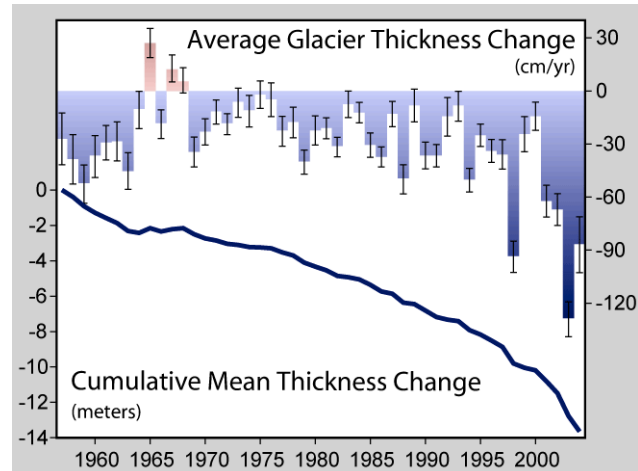
As we increase the temperature on Earth, we start to melt the ice at the poles (poor Santa). There is so much water trapped there, that when the ice melts, it causes sea levels to rise and extreme weather events like hurricanes and tornadoes (Shaftel, 2016) to occur. Also, when the ice melts, many animals lose their homes and can die.

What can we do to help?

Some of the things we can do to help include:

- Using energy-efficient light bulbs.
- Carpooling and using public transportation or walking.
- Turning down our air conditioner in the summer and furnace in the winter.
- Using green energy sources like wind and solar power to create electricity.

As Jimmy Kimmel put it, “You know how you know that climate change is real? When the hottest year on record is whatever year it currently is.”



This graph shows how the polar ice has been melting since 1960. Photo Credit - Robert A. Rohde

Reading Comprehension Questions

1. What is climate?
2. What is the greenhouse effect? Why is it important? How are we changing it?
3. What are some of the things that could happen due to global warming?

Watch the following video to answer questions 4-6. The video can be found by accessing the following URL or QR code:



<https://goo.gl/HfjFYI>

4. If the world's temperature increased by 1 degree, what would happen to the amount of fresh water?
5. How much sea ice has disappeared in the last 30 years?
6. By 2100, how high could sea levels rise and what TWO main consequences could that have?

Extension Questions

7. What do you think will happen if we do nothing about our climate change?
8. What part of your daily routine can be changed to help the climate change crisis? Provide at least 5 things YOU can do to help.
9. Create a short (1-2 minute) video about the severity of climate change to be shown to a grade 1 class. Your language and presentation must be at a level your audience can understand. Your video should provide information on what is happening as well as ways everyone can help.

Reading Comprehension Questions – Answer Key

1. What is climate? **Climate defines an area’s “average weather”, including temperature, precipitation, humidity, wind and even seasons**
2. What is the greenhouse effect? Why is it important? How are we changing it? **The greenhouse effect is when a layer of gases in the atmosphere absorbs heat from the Earth to keep it warm. It is important because without it, the Earth would be too cold to live on. We are adding greenhouse gases to the atmosphere, increasing the greenhouse effect and warming the planet too much.**
3. What are some of the things that could happen due to global warming? **Melting polar ice, sea level rising, extreme weather events like hurricanes and tornadoes and animals displaced from their homes.**

Watch the following video to answer questions 4-6. The video can be found by accessing the following URL or QR code:



<https://goo.gl/HfjFYI>

4. If the world’s temperature increased by 1 degree, what would happen to the amount of fresh water? **1/3 of it could be gone.**
5. How much sea ice has disappeared in the last 30 years? **40%**
6. By 2100, how high could sea levels rise and what TWO main consequences could that have? **The seas could rise by 1 m by the year 2100 which could displace 10% of the world’s population and potentially cause 1/3 of all life to go extinct.**

Extension Questions

7. What do you think will happen if we do nothing about our climate change? **Answers may include: Soon, the earth will become too hot to inhabit. The Polar Regions will melt. Many cities will be under water. Many species will disappear. Severe weather patterns may bring droughts and floods to certain regions.**
8. What part of your daily routine can be changed to help the climate change crisis? Provide at least 5 things YOU can do to help. **Answers will vary.**
9. Create a short (1-2 minute) video about the severity of climate change to be shown to a grade 1 class. Your language and presentation must be at a level your audience can understand. Your video should provide information on what is happening as well as ways everyone can help.

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