



Climate Change

Introduction

- Weather changes are pretty dramatic in all parts of the world; sometimes you wake up to stormy skies and cold rain and other days it's sunny and warm. But while the weather changes everyday, the climate doesn't usually change that much.
- What's the difference between weather and climate? **Climate** is more like saying that Antarctica is usually cold and dry, and a tropical rainforest is usually hot and wet, and New York is usually somewhere in the middle. You determine the climate by looking at the weather in a place over a long period of time, like 30 years.
- But the thing is, now the climate is also changing. And it's because of things humans have done to the environment, like burning a lot of fuels and cutting down trees.

Why is the climate changing?

To get to the bottom of why the climate is changing, we need to talk about those fuels, called "fossil fuels". But in order to do that, we have to go way back in time- like 300 million years ago, way before any people were around, to when our planet looked like nothing you've ever seen before. Imagine a [swamp and forest combined](#), filled with giant plants with scaly bark. And other creatures were there too: there were dragonflies that were the [size of seagulls](#)! I imagine it was pretty hot and sticky.

Over a long time, these plants died- and instead of turning back into dirt like plants do today, they piled up, and over years and years that pile got so heavy that the plants turned into something new: the plants became fossils, just like the remains of dinosaurs are fossils. But the interesting thing about fossils is that they can be used for energy, or fuel. That's where the phrase, "[fossil fuel](#)" comes from. To sum it up, oil, natural gas and coal are fossil fuels, the buried remains of plants and animals that lived millions of years ago.

Fossil Fuels as Energy

Flash back to modern times: Humans have dug and drilled and blasted into the earth to bring these fossil fuels to the surface and now we [use those fuels for energy](#).

Our society today depends on fossil fuels:

- We use fossil fuels, in the form of gasoline, to make our cars run,
- Or we use them as oil or gas for heating our houses,
- Or we use coal, gas or oil in power plants to make electricity to turn on the lights or power our dishwashers and everything else you can plug into a socket.

Fossil Fuels Emit Greenhouse Gases

But what do ancient plants and fossil fuels have to do with the climate?

Well, the answer is that in order to use these fuels for energy, we have to burn them. Burning turns the fuels into gases. Think about a campfire: the fire turns the wood (the fuel) into smoke, a gas. It's those gases, particularly ones called "greenhouse gases" that are the REAL problem when it comes to a changing climate. Because there are so many people on earth who use fossil fuels, the greenhouse gases have built up and changed our atmosphere.

What is a gas?

- Gases are mostly invisible, so they're easy to forget- but gases make up the air we breathe.
- Gases also make up the sky, and the layer of gases that protects the earth is called the atmosphere.
- The atmosphere is like a blanket covering the earth and keeping us alive- with enough warmth to live and enough air to breathe

Greenhouse effect

- But with a lot of "greenhouse gases" in the air, the blanket has become too warm
- When sunlight comes and hits the earth, the heat gets stuck under this thick atmosphere blanket
- So while the atmosphere naturally makes the earth the right temperatures for living, adding the gases from the burning of fossil fuels is making it TOO warm.
- It's kind of like being in a car on a hot day: if you have the windows open, it gets a little warm, but the heat doesn't build up too much in the car because it can escape through the windows. But if you have the windows closed on a sunny day, the car gets really hot inside, keeping the heat in.
- The same thing happens in a greenhouse which keeps plants nice and warm: sunlight comes in through the glass roof and heats up the room because the heat can't escape.
- So these gases from fossil fuels have built up and are making the earth hotter by acting like a big blanket, or a hot car, or a greenhouse. That's why they're called "greenhouse gases"!

Impact of Greenhouse Effect

Heating up the planet impacts LOTS of things- it literally makes the climate change.

- That doesn't mean that every day is hotter than it was the day before
- But when you look at the weather across the planet over a year, it's hotter than it was the year before.
- That impacts nature in a lot of ways, but we'll talk more about that in another podcast.

Deforestation

One last point: remember those plants from before? All plants, and especially trees, take greenhouse gases out of the air. They take it in through their leaves and use it to grow. This means that trees can help reverse the problem that we're causing.

Except.... we're also cutting down the trees! When you cut down a forest, it's called deforestation.

In 2017, [39 million acres](#) of forests were cut down.

- The *Global Forest Watch* puts that number in perspective, saying it's the equivalent of losing 40 football fields of trees every minute for an entire year.
- And the Amazon Jungle, the world's largest tropical rainforest, has lost nearly a fifth of its forest cover in the last 50 years.

A lot of this deforestation happens so that people living in the area can use the land for [farming](#): to grow the food they need to survive, or to make money from big companies for their livelihoods.



But cutting down these forests is still not good for us, or for the planet.

Conclusion

From ancient plants, to fuel, to greenhouse gases, to a warmer planet– climate change is complicated.

But knowing more about it can help us change our actions, so we can keep our planet safe and healthy for the future.

Resources

Climate Change

- <https://climatekids.nasa.gov/tree-rings/>
- <https://www.funkidslive.com/learn/geology-rocks/geology-rocks-carboniferous-period/>
- <https://www.nationalgeographic.com/science/article/carboniferous#close>
- <https://climatekids.nasa.gov/carbon/>

Fossil Fuels as Energy

- <https://www.nrdc.org/stories/fossil-fuels-dirty-facts>

Greenhouse Effect

- <https://climatekids.nasa.gov/greenhouse-effect/>

Deforestation

- <https://www.globalforestwatch.org/blog/data-and-research/2017-was-the-second-worst-year-on-record-for-tropical-tree-cover-loss/>
- https://www.cfr.org/interactives/amazon-deforestation/?gclid=Cj0KCQjwybD0BRDyARIsACyS8mtcEjoEYm57Fw72shWjtF8SkOHRbvEqm9xEb0YG3pDa0v9iHP5y5o8aAqnzEALw_wcB#/en
- <https://wriorg.s3.amazonaws.com/s3fs-public/ending-tropical-deforestation-tropical-forests-climate-change.pdf>
- <https://www.sciencedirect-com.proxy.library.cornell.edu/science/article/pii/S0959378018314365>
- https://www.cfr.org/interactives/amazon-deforestation/?gclid=Cj0KCQjwybD0BRDyARIsACyS8mtcEjoEYm57Fw72shWjtF8SkOHRbvEqm9xEb0YG3pDa0v9iHP5y5o8aAqnzEALw_wcB#/en