Please mute your microphones.
You may keep your video on if you wish.
We will begin shortly.

Thank you.

FYS

Sea Level Activity

Environmental Science

Materials

Two identical, clear plastic containers/Tupperware

Ice cubes

Clay/Play-Doh or small rocks

Ruler

Cold water

Paper

Marker (optional)

Let's Think:

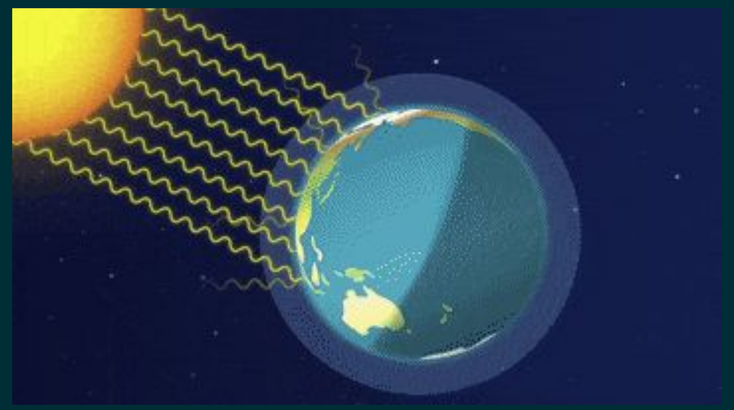
What do you know about global warming? Why is it bad?

Let's Think:

What is a gas? (the state of matter, not the kind you use to power a car)

Greenhouse Gases

- Gases in Earth’s atmosphere that trap **heat.**
- They let sunlight pass through the atmosphere, but they prevent the heat that the sunlight brings from leaving the atmosphere.
- The greenhouse gas which causes the most global warming is carbon dioxide.



Let's Think:

What do you remember about carbon dioxide from our leaf pigment extraction lesson?

Deforestation

- Deforestation is the process of cutting down a lot of trees at one time.
- Most of the reason, trees are cut down to get empty space; for example, if farmers want large fields to grow crops, they have to cut down trees.
- *Why might this contribute to global warming?*

Fossil Fuels

- The biggest reason for global warming is the burning of “fossil fuels,” which are coal, oil, and natural gas.
- When these fossil fuels are burned, a lot of **carbon dioxide** is released into the atmosphere, leading to the heat being trapped.
- Fossil fuels are used in a lot of things that we use daily:
  - Cars
  - Electricity (in some cases)
  - Heating for your house
  - Industrial production (factories)

Let's Think:

If you have a glass of water with ice in it, what happens as the ice melts? Does the amount of water increase or decrease?

It increases! Similarly, you might have heard that melting ice causes rises in sea levels.

Let’s make a list of a few places where you might find ice in nature.

- Glaciers
- Frozen Lakes and Ponds
- Arctic and Antarctic Oceans
- Top of a mountain
- Ice caves
- Frozen Waterfalls
- Icebergs

Those places can be sorted into two categories: ice that is on land and ice that is in the sea!

These groups are important because ice on land and ice on the sea melt differently. This is what we're going to model in today's activity.

Now, let’s sort these places into two groups! (sea/land ice)

- Arctic and Antarctic Oceans
- Icebergs
- Glaciers
- Ice Caves
- Frozen Lakes/Ponds
- High Mountain Peaks
- Frozen Waterfalls

Sea

- Arctic and Antarctic Oceans
- Icebergs

Land

- Glaciers
- Ice Caves
- Frozen Lakes and Ponds
- High Mountain Peaks
- Frozen Waterfalls

In our experiment, we will be modeling **Glaciers** and **Icebergs**!

Glaciers

Glaciers are large **bodies of ice** formed from snowfall over many years. They form over **land areas.**

They can be found in polar regions, such as Antarctica and Greenland, as well as in high mountain ranges around the world.

Iceberg

Icebergs are large **chunks of ice** that have **broken off from glaciers** and **float in bodies of water**.

They are commonly found in the Arctic and Antarctic regions, as well as in some colder oceans.

Questions?

Procedure

1. Press equal amounts of clay into one side of both plastic containers, making a smooth, flat surface representing land rising out of the ocean. If you don’t have clay, try using some rocks to create a “land” surface on which you can place several ice cubes.
2. In one container, place as many ice cubes as possible on the flat clay or rock surface. This represents land ice.
3. In the other container, place the same number of ice cubes on the bottom of the container, next to the clay. This represents sea ice.

Procedure

4. Pour cold water into the sea-ice container until the ice floats. Be sure no ice is resting on the bottom of the container and that the water isn't higher than the land level.
5. Without disturbing the ice cubes, pour water into the land-ice container until the water level is about equal to the water level in the sea-ice container.

What do you think is going to happen?

What might be different about the containers?

Procedure (Cont.)

6. Using the ruler, measure the water level (in millimeters) in each container and record the data on your data sheet or piece of paper.
7. You can mark the water level with a marker on the outside of the container, but remember the ink might not come off. Another way to mark the water level is to make a line in the clay using a pencil or other object.

Procedure (Cont.)

7. At regular intervals – maybe every minute or five minutes – measure the water level in each container again and record it on the data sheet. Compare the water level with the marked line on the side of the container or in the clay. Allow the ice in both tubs to melt completely.
8. Let’s look at our measurements and observe what happened!

Think about what your observations mean for melting ice around the planet and how it contributes to sea level rise.

Let’s Think:

Have you ever seen a solar panel? What does it do?

Renewable Energy

- To fix the issue of greenhouse gases and global warming, new solutions have been created such as **Renewable Energy**
- Renewable energy is made from resources that are almost unlimited in nature, like **wind**, **water** and **sunshine.**
- Also known as **Clean Energy** or **Green Power** because it does not pollute the air or water.

Types of Renewable Energy

- There are various types of renewable energy that are used throughout the world to help lessen the effect of greenhouse gases.
- Types include: **Solar Power, Wind Power, Hydropower, Geothermal Energy, Bioenergy,** and much more
- Each of these types of energy use materials from nature that our world naturally reproduces and replenishes.

Renewable energy sources, like the ones we talked about, are necessary to **prevent** global warming.

Reflection Questions

1. In which container did the water level rise more? How does this compare to your prediction? Why do you think this occurred?
2. Does the melting of Earth’s glaciers on land contribute to sea level rise? How about the melting of icebergs at sea?
3. What was your favorite part of this experiment?

If you’re interested in taking more experiment-based classes, you can sign up for our Nebula session, which is being held from August 12 - September 9.

To register, visit futureforyoungscientists.org/nebula or scan the QR code.

Thank you for attending our classes this year!

We hope you enjoyed the experiments and learned about new topics in STEM. We believe that you all can use your gift of knowledge to advance our world in the future by being the next generation of scientists!

Thank you for an amazing session!

Visit our website, **futureforyoungscientists.org**.

If you have any photos from this week, please share these with us by email (futureforyoungscientists@gmail.com) or Facebook, as we would like to be able to share everyone's experience.