

Sea Ice vs. Land Ice Activity

Did you know that there are different types of ice on the Earth? Sea ice is frozen sea water that floats on the ocean. Land ice is formed from falling snow and becomes compacted year after year.



Sea Ice



Land Ice

Photos courtesy NASA Operation IceBridge

Ice on Earth is experiencing increased melting due to global warming which has many effects such as sea level rise. This impacts Earth's climate, humans, and animals. See for yourself what happens when sea ice and land ice melts. Satellites like ICESat-2 are measuring ice thickness from space.

You will need

- Two identical clear containers (plastic storage containers or glasses)
- Water
- Ice
- Item(s) to represent land (rocks, clay, or a smaller container that fits within the larger one)
- Ruler
- Marker or grease pencil



Instructions

- Freeze two blocks of ice of equal volume, or use ice cubes. (Whatever you use, make sure they will fit inside your container.)
- Set up your two identical containers – one to represent 'sea ice,' the other for 'land ice'.
- Build up your land inside the land ice container so that it protrudes above the water level. (Make sure it is high enough to be above your water level.)

- Fill the sea ice container with water approximately $\frac{1}{2}$ to $\frac{3}{4}$ full but not completely full, then place your ice in the container.
- Place the land ice container next to the sea ice container. Fill water to the same level as the water in the sea ice container.
- Draw a line using the ruler where the water level is on both containers. You could use a marker or grease pencil that can be easily removed later. (The level should be the same on both containers, if not, add or remove water.)



- Place the same amount of ice on top of the land in the land ice container.



Wait to see what happens when they melt. (It may take a while depending on air temperatures. Note, ice melts quicker in water than on land.)

Once all the ice has melted, draw a new line to show the difference. Then measure the difference and record. Did one container's sea level rise? If so, why?

If one container's level did not rise, why not? How do you think melting ice in the polar regions effect the rest of the planet?

Notes to Parents and Teachers

The Sea Ice vs Land Ice Activity is for middle school level children (~grades 5-10).

NASA's ICESat-2 launched in 2018, is taking measurements of the ice, as well as trees, land, oceans, and clouds. ICESat-2 provides scientists with important measurements of sea ice thickness to learn about how our polar regions are changing. For more information on ICESat-2, ice and sea level rise, check out: <https://icesat-2.gsfc.nasa.gov/> and more...

- Sea ice animation with polar bear <https://svs.gsfc.nasa.gov/10492>
- Earth Observatory for Kids article and DIY science: https://earthobservatory.nasa.gov/blogs/eokids/wp-content/uploads/sites/6/2020/03/25_Sea-Ice_508.pdf
- Sea Level Rise video: <https://www.jpl.nasa.gov/edu/learn/video/nasas-earth-minute-sea-level-rise/>
- NASA Sea Level Rise Info: <https://science.nasa.gov/earth-science/agu2020/rising-seas>
- Lessons in Sea Level Rise (grades 5-12): <https://www.jpl.nasa.gov/edu/teach/activity/the-science-of-earths-rising-seas/>
- Earth Observatory for Kids Sea ice melting DIY: <https://www.youtube.com/watch?v=uYhErFo67ow>