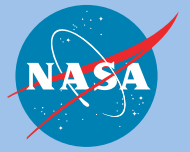


Classroom Viewing Guide



Our World: ICESat-2 – What is Ice? <http://youtu.be/ve9XV9TYJOE>

Introduction:

Water has some very unique properties, but what are they? What do they mean for us? Water, unlike other types of matter, is less dense as a solid than as a liquid. This means more than simply floating cubes in a cold drink. The various forms of water allow life on our world to thrive!

Guiding Questions:

What is ice?

What are some of the properties of ice?

Which is more dense, liquid water or frozen water?

Why is ice important to life on Earth?

Possible Next Generation Science Standards Addressed:

2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Glossary of Terms

Climate: the long-term pattern of weather in a particular area

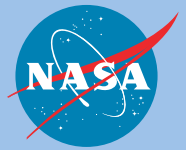
Ice: frozen water

Ice Sheet: a permanent layer of ice covering an extensive area of land

ICESat-2: the Ice, Cloud, and land Elevation Satellite-2

Polar Areas (Regions): the part of the Earth's surface forming a cap over a pole; characterized by a very cold climate





Mini-Lesson

Part 1: Calculating the density of a single ice cube

Materials Needed:

1. One ice cube
2. Electronic Scale
3. Centimeter ruler
4. Glass of room temperature water

Table 1:

mass of ice cube (g)	Length of ice cube (cm)	Width of ice cube (g)	Height of ice cube (g)	Density of ice cube (g/cm ³)

1. Quickly get the mass of your ice cube on a electronic scale?
2. Quickly measure the length, width, and height of your ice cube. Measure in cm
3. Multiply these measurements to get the volume of your ice cube.
4. Using the equation for density of Density=mass (g)/volume (cm³)
5. Write your answers in Table 1 above.
6. Is the density of your ice cube more or less than the density of water?
7. Prove that your measurements are correct by dropping your ice cube in a glass of water.

Part 2: Understanding the size of the Greenland and Antarctic ice sheets

1. To compare the volume of your ice cube to the Greenland and Antarctic ice sheets, you must first convert your volumetric units of cm³ to km³.
2. Fill in Table 2.

Table 2:

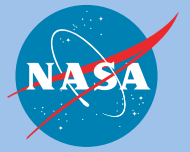
Volume of your ice cube (cm ³)	Volume of your ice cube (km ³)	Volume of Greenland (km ³)	Volume of Antarctica (km ³)
		2,850,000	25,700,000

3. Once you have converted your units, you can now see how many of your ice cubes you would need to equal the volume of the Greenland and Antarctic ice sheets.
4. What calculations would you need to do to fill in Table 3?

Table 3:

Number of your ice cubes it would take to equal the volume of the Greenland ice sheet
Number of your ice cubes it would take to equal the volume of the Antarctic ice sheet





Discussion Questions:

1. Are you surprised at how much ice is on Greenland and Antarctica?
2. Why is knowing how much ice is on Greenland and Antarctica important?

