

Topic: States of Matter

Will the Ice Melt and Overflow?

<http://www.sciencekids.co.nz/experiments/iceoverflow.html>

At first thought you might think that an ice cube sitting at the very top of a glass would eventually melt and spill over the sides but is this what really happens? Experiment and find out!

What you'll need:

- A clear glass
- Warm water
- An ice cube

Instructions:

1. Fill the glass to the top with warm water.
2. Gently lower in the ice cube, making sure you don't bump the table or spill any water over the edge of the glass.
3. Watch the water level carefully as the ice cube melts, what happens?

What's happening?

Even though the ice cube melted the water doesn't overflow. When water freezes to make ice it expands and takes up more space than it does as liquid water (that's why water pipes sometimes burst during cold winters). The water from the ice takes up less space than the ice itself. When the ice cube melts, the level of the water stays about the same.

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Melting Ice

<http://www.scienceweek.ie/assets/media/Resources/Primary%20Schools/2012%20activities/2012-Science-Week-melting-ice.pdf>

Water can exist in three different states: Ice is the solid state of water The water that comes out of our taps, flows down our rivers and falls as rain is the liquid state of water The steam that comes out of our kettles is the gas state of water

Pure water will change into ice at 0°C and into steam at 100°C

Which do you think will melt faster - pure ice or ice with salt sprinkled on it?

Let's investigate.

What you need

2 bowls

2 thermometers that can read below 0°C

8 ice cubes

Salt

What you do

1. Place 4 ice cubes in each bowl (remember fair testing!)
2. Place a thermometer in each bowl, and record the temperature. What do you notice? Yes, the temperature of the ice in each bowl is the same
3. Sprinkle salt on the ice cubes in one bowl as shown
4. Observe closely what happens to the ice cubes in each bowl and the temperature reading on the thermometers

What happens?

1. The ice cubes with the salt sprinkled on them melt more quickly than those in the bowl with no salt on them
2. The temperature reading on the thermometer in the bowl with the ice cubes and salt drops below zero, while the temperature reading on the thermometer in the bowl of ice remains at zero as the ice melts

Why?

Adding salt to the ice lowers the freezing point of water, therefore the ice melts.

In the above activity we saw that sprinkling salt on ice makes it melt. During the winter salt is often spread on ice-covered roads to make them safer

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Melting Polar ice caps

If the polar ice caps melted, would the sea level rise?

MATERIALS

- Tray of ice blocks
- Large cup (milkshake cup is perfect)
- Enough water to fill the cup

STEPS

1. The ice in this experiment represents the polar ice caps. Empty the tray of ice cubes into the cup. Filling the cup halfway should be sufficient for this experiment to work.
2. Carefully fill the cup with water. Try to get the water level as close to the rim of the cup as possible without overflowing it. The water in this experiment represents the oceans of the world.
3. Now, wait for the polar ice caps (the ice) to melt. Predict what you think will happen. Do you think the water will rise and overflow, stay the same or decrease?

DID YOU KNOW?

It is not the melting polar ice caps that will contribute to the rising of the sea level. The major contributor will be the snow melting from the mountain areas.

Topic: States of Matter / Change

Density of Ice-cube, water and oil

Aim: Difference in density of ice-cube, water and oil.

In this experiment we will see how different substance have different properties and how they behave when we bring them together based on the property of Density.

Materials: Prepared coloured ice-cubes, a glass, and cooking oil.

Procedure:

1. Pour oil in a glass, up to 3/4. Of the glass.
2. Put the coloured ice-cube into it.

Observation:

Record what you see.

Explanation and Understanding: This is a demonstration of a dyed ice cube melting in cooking oil. The density of ice is less than water and the oil, so the cube floats. The water is denser, so it sinks. Water expands when cooled. This unique property of water is due to hydrogen bonding.

Inference: All chemicals including water have specific properties and they do not change. Water is denser than oil. Ice cube floats on oil as the cube is colder than water hence it is lighter. (When water is frozen, it expands and hence it is lighter than water)