Name: _____ Date: _____

Why Ice Floats

Circle group

Drop an ice cube into a glass of water. It bobs to the top and floats. That may seem normal, but it is not. For almost every other substance, the solid is heavier than the liquid. It sinks. Water is one of the few exceptions.

The reason is in how water freezes. As water cools, its tiny particles, called molecules, slow down. They move closer together. Near the freezing point, they lock into a rigid pattern. The pattern has open spaces in it. So the molecules end up a bit farther apart than in the liquid. Frozen water takes up about nine percent more space. The same matter in more space is less dense. Less dense things float.

This matters for life on Earth. In winter, a pond cools from the top. Ice forms at the surface and does not sink. The floating layer works like a blanket. It slows the loss of heat from the water below. Fish and other pond animals can live in the liquid underneath all winter.

Icebergs float for the same reason. Ice is only a little lighter than liquid water. So about nine tenths of an iceberg is hidden under the surface.

Questions

1. Why does an ice cube float?

_____

_____

2. How much more space does frozen water take up?

_____

_____

3. Where does ice form on a pond in winter?

_____

_____

4. How does the ice layer help fish in a pond?

_____

_____

5. Why is most of an iceberg under the water?

_____

_____

Words to know

molecules: the tiny particles that everything is made of
dense: packed with a lot of matter in a small space
rigid: stiff and not able to bend or flow
surface: the top layer of something
iceberg: a huge chunk of floating ice
exceptions: things that do not follow the usual rule

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Why Ice Floats

Triangle group

If you drop an ice cube into a glass of water, it bobs to the top and floats. That may seem ordinary, but it is actually unusual. For almost every other substance, the solid form is heavier than the liquid form and sinks in it. Water is one of the few exceptions.

The reason lies in how water freezes. As water cools, its tiny particles, called molecules, slow down and move closer together. Near the freezing point, however, they begin to lock into a rigid pattern with open spaces between them. The pattern holds the molecules slightly farther apart than they were as a liquid, so frozen water takes up about nine percent more space. The same amount of matter spread over more space is less dense, and less dense things float.

This odd behavior matters for life on Earth. When winter arrives, a pond cools from the top, and ice forms at the surface instead of sinking. The floating layer works like a blanket, slowing the loss of heat from the water below. Fish and other pond animals can survive in the liquid underneath all winter long.

Icebergs float for the same reason. Because ice is only a little lighter than liquid water, about nine tenths of an iceberg stays hidden below the surface.

Questions

1. Why does an ice cube float in water?

_____

_____

2. About how much more space does frozen water take up than liquid water?

_____

_____

3. Where does ice form on a pond in winter?

_____

_____

4. How does a floating layer of ice help the fish in a pond?

_____

_____

5. Why is most of an iceberg hidden below the water?

_____

_____

Words to know

molecules: the tiny particles that everything is made of
dense: packed with a lot of matter in a small space
rigid: stiff and not able to bend or flow
surface: the top layer of something
iceberg: a huge chunk of floating ice
exceptions: things that do not follow the usual rule

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Why Ice Floats

Square group

If you drop an ice cube into a glass of water, it bobs to the top and floats. That may seem perfectly ordinary, but it is in fact quite unusual. For almost every other substance, the solid form is denser than the liquid form and therefore sinks in it. Water is one of the very few exceptions to this rule.

The explanation lies in the way water freezes. As water cools, its tiny particles, called molecules, slow down and move steadily closer together. Near the freezing point, however, they begin to lock into a rigid, orderly pattern with open spaces between them. That pattern holds the molecules slightly farther apart than they were in the liquid, so frozen water occupies about nine percent more space. The same amount of matter spread across a larger volume is less dense, and less dense materials float.

This peculiar behavior has enormous consequences for life on Earth. When winter arrives, a pond cools from the top downward, and ice forms at the surface instead of sinking to the bottom. The floating layer acts like a blanket, slowing the loss of heat from the water beneath it. Fish and other pond animals are able to survive in the liquid below throughout the entire winter.

Icebergs float for precisely the same reason. Because ice is only slightly lighter than liquid water, about nine tenths of an iceberg remains hidden beneath the surface.

Questions

1. Why does an ice cube float in a glass of water?

_____

_____

2. About how much more space does frozen water occupy than liquid water?

_____

_____

3. Where does ice form on a pond when winter arrives?

_____

_____

4. How does the floating layer of ice make it possible for fish to survive the winter?

_____

_____

5. Why does most of an iceberg remain hidden beneath the surface?

_____

_____

Words to know

molecules: the tiny particles that everything is made of
dense: packed with a lot of matter in a small space
rigid: stiff and not able to bend or flow
surface: the top layer of something
iceberg: a huge chunk of floating ice
exceptions: things that do not follow the usual rule

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Why Ice Floats

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Why Ice Floats

Easier · 198 words · Flesch-Kincaid grade 3.8

1. Frozen water is less dense than liquid water.
2. About nine percent more.
3. At the top, on the surface.
4. It works like a blanket, so the water below stays liquid.
5. Ice is only a little lighter than water, so it floats low.

Triangle: Why Ice Floats

This passage · 215 words · Flesch-Kincaid grade 7.1

1. Frozen water is less dense than liquid water.
2. About nine percent more.
3. At the surface.
4. It acts like a blanket that slows heat loss, so the water below stays liquid.
5. Ice is only a little lighter than liquid water, so it floats low in the water.

Square: Why Ice Floats

Harder · 236 words · Flesch-Kincaid grade 8.8

1. Frozen water is less dense than liquid water.
2. About nine percent more.
3. At the surface.
4. It acts like a blanket that slows heat loss, so the water beneath stays liquid.
5. Ice is only slightly lighter than liquid water, so it floats low in the water.