Name: _____ Date: _____

Lake Turnover: Why Lakes Mix Twice a Year

Circle group

In summer, a deep lake has layers. The sun warms the top. Warm water is light, so it stays on top. The cold, heavy water stays below. The layers do not mix. Fish at the bottom use up the oxygen. Not much new oxygen can reach them.

Then autumn comes. The air gets cool. The top water gets cool, too. Cool water is heavy, so it sinks. Wind stirs the lake. The layers mix. The lake turns over. Oxygen goes down to the bottom. Nutrients rise up from the mud.

In winter, the heaviest water is just above freezing. It stays at the bottom. Colder water and ice float on top. In spring, the ice melts. The top water warms up and sinks. The lake mixes again. The two turnovers help the plants, fish, and insects in the lake.

Questions

1. Why does warm water stay on top in summer?

_____

_____

2. What happens to the oxygen at the bottom in summer?

_____

_____

3. What two things mix the layers in autumn?

_____

_____

4. In which two seasons does a lake turn over?

_____

_____

5. Why does the water just above freezing stay at the bottom in winter?

_____

_____

6. Why are the turnovers good for lake animals?

_____

Words to know

layers: levels of something stacked one above another
oxygen: a gas in air and water that animals need to breathe
nutrients: materials that living things need in order to grow
turnovers: times when a lake's layers flip and mix together

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: _____

Lake Turnover: Why Lakes Mix Twice a Year

Triangle group

In summer, a deep lake in a cool place is a bit like a layered drink. The sun warms the top, and warm water is lighter, so it floats above the cold, heavy water below. A calm line between the layers keeps them apart. Down in the cold layer, fish and other animals slowly use up the oxygen, and very little new oxygen can reach them.

Then autumn comes. The air turns cool, and the top layer cools too. Cooler water is heavier, so it begins to sink. Wind pushes the surface around and helps to stir the whole lake. Soon the layers blend together, and the lake turns over. Fresh oxygen from the surface travels to the bottom, and nutrients from the muddy bottom are stirred upward.

Winter brings a second change. Water is heaviest at a temperature just above freezing. That heaviest water stays near the bottom, while colder water and ice float above it. In spring, the ice melts, the top water warms to that heavy point, and it sinks. This mixes the lake a second time. The two turnovers each year keep a lake healthy for the plants, fish, and insects that live there.

Questions

1. Why does warm water float on top of the lake in summer?

_____

_____

2. What happens to the oxygen in the cold bottom layer during summer?

_____

_____

3. What two things help mix the layers together in autumn?

_____

_____

4. In which two seasons does a lake turn over?

_____

_____

5. Why does the water just above freezing stay near the bottom in winter?

_____

_____

6. Why are the two turnovers good for the animals in a lake?

_____

_____

Words to know

layers: levels of something stacked one above another
oxygen: a gas in air and water that animals need to breathe
nutrients: materials that living things need in order to grow
surface: the top of the water, where it meets the air
turnovers: times when a lake's layers flip and mix together

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: _____

Lake Turnover: Why Lakes Mix Twice a Year

Square group

During the summer, a deep lake in a cool region separates into distinct layers, much like a layered drink. The sun warms the surface, and because warm water is lighter than cold water, it floats on top of the heavy, chilly water beneath it. A steady boundary between the layers keeps them from blending. Down in the cold layer, fish and other animals gradually use up the oxygen, and very little fresh oxygen can make its way down to replace it.

Autumn changes everything. As the air turns cool, the surface layer cools as well. Cooler water is heavier, so it begins to sink, and the wind churns the surface and helps to stir the entire lake. Before long the layers have blended together, and the lake has turned over. Fresh oxygen from the surface is carried all the way to the bottom, while nutrients from the muddy lake floor are stirred upward into the water above.

Winter brings a second change. Water is at its heaviest at a temperature just above freezing, so that heaviest water remains near the bottom, while colder water and ice float above it. When spring arrives, the ice melts, the top water warms to that same heavy point, and it sinks, which mixes the lake for a second time. These two turnovers each year keep the lake healthy for the plants, fish, and insects that make their homes in it.

Questions

1. Why does warm water float on top of a lake during the summer?

_____

_____

2. What happens to the oxygen in the cold bottom layer during summer?

_____

_____

3. Which two things help to blend the layers together in autumn?

_____

_____

4. In which two seasons does a lake turn over?

_____

_____

5. Why does the water just above freezing remain near the bottom in winter?

_____

_____

6. Why are the two yearly turnovers important for the animals in a lake?

_____

_____

Words to know

layers: levels of something stacked one above another
oxygen: a gas in air and water that animals need to breathe
nutrients: materials that living things need in order to grow
surface: the top of the water, where it meets the air
turnovers: times when a lake's layers flip and mix together

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: Lake Turnover: Why Lakes Mix Twice a Year

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

Circle: Lake Turnover: Why Lakes Mix Twice a Year

Easier · 139 words · Flesch-Kincaid grade 1.4

1. Warm water is lighter than cold water.
2. Animals use it up, and not much new oxygen reaches them.
3. Cooling water sinks, and wind stirs the lake.
4. Autumn and spring.
5. It is the heaviest water, so it sits below the colder water and ice.
6. They bring oxygen to the bottom and lift nutrients up.

Triangle: Lake Turnover: Why Lakes Mix Twice a Year

This passage · 198 words · Flesch-Kincaid grade 4.9

1. Warm water is lighter than the cold water below it.
2. Animals slowly use it up, and very little new oxygen reaches them.
3. Cooling surface water sinks, and wind stirs the lake.
4. Autumn and spring.
5. It is the heaviest water, so it sinks below the colder water and ice.
6. They carry fresh oxygen down to the bottom and lift nutrients up.

Square: Lake Turnover: Why Lakes Mix Twice a Year

Harder · 236 words · Flesch-Kincaid grade 7.7

1. Warm water is lighter than the cold water beneath it.
2. Animals gradually use it up, and very little fresh oxygen can reach them.
3. The cooling surface water sinks, and the wind stirs the lake.
4. Autumn and spring.
5. It is the heaviest water, so it sinks below the colder water and the ice.
6. They carry fresh oxygen down to the bottom and lift nutrients upward.