Name: _____ Date: _____

The Wood Frog That Freezes Solid Each Winter

Circle group

Winter is hard for animals that cannot make their own heat. The wood frog lives in forests across much of North America. It has no burrow deep enough to escape the cold. So it settles under fallen leaves. Then it does something that sounds impossible. It lets itself freeze.

As the air gets colder, ice forms between the frog's cells and under its skin. Its heart stops. Its breathing stops. If a person found it, the frog would look like a stiff lump of ice. But it is still alive.

The secret is in what the body does just before the freeze. The frog's liver sends lots of glucose, a kind of sugar, into the blood. The sugar works like the antifreeze in a car. It stays in the cells and keeps them from freezing. This protects them from the harm that ice crystals could do.

In spring, the process runs backward. The ice melts. The heart starts to beat again. The frog starts to breathe. In a day or two it is hopping and looking for a pond. Wood frogs are among the first frogs to call and mate each year.

Questions

1. Where does a wood frog spend the winter?

_____

_____

2. What happens to the frog's heart and breathing when it freezes?

_____

_____

3. What does the frog's liver send into the blood before the freeze?

_____

_____

4. What happens to the frog in spring?

_____

_____

5. Why does the passage compare glucose to car antifreeze?

_____

_____

6. Why does the writer say the frog is still alive?

_____

_____

Words to know

burrow: a hole or tunnel an animal digs to live in
glucose: a simple sugar that gives living things energy
antifreeze: a liquid added to stop water from freezing
crystals: tiny hard pieces with sharp edges, such as ice

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: _____

The Wood Frog That Freezes Solid Each Winter

Triangle group

Winter is a hard season for any animal that cannot make its own body heat. A wood frog, which lives in forests across much of North America, has no burrow deep enough to escape the cold. Instead it settles under a blanket of fallen leaves and does something that sounds impossible. It allows itself to freeze.

As the temperature falls, ice begins to form in the spaces between the frog's cells and under its skin. Its heart stops beating and its breathing stops. To a person who found it, the frog would look like a small, stiff lump of ice. Yet it is still alive, waiting.

The secret lies in what happens inside the body just before the freeze. The frog's liver releases large amounts of glucose, a kind of sugar, into the blood. This sugar works somewhat like the antifreeze in a car. It stays inside the cells and keeps them from freezing, which protects them from damage that ice crystals would cause.

When spring arrives, the process runs in reverse. The ice melts from the inside outward, the heart starts beating again, and the frog begins to breathe. Within a day or two it is hopping around and looking for a pond. Wood frogs are among the first amphibians to call and mate each year, ready to begin again as soon as the world thaws.

Questions

1. Where does a wood frog spend the winter?

_____

_____

2. What happens to the frog's heart and breathing when it freezes?

_____

_____

3. What does the frog's liver release before the freeze?

_____

_____

4. What happens to the frog when spring arrives?

_____

_____

5. Why does the passage compare glucose to car antifreeze?

_____

_____

6. Why does the writer say the frog is still alive even though it looks like ice?

_____

_____

Words to know

burrow: a hole or tunnel an animal digs to live in
glucose: a simple sugar that gives living things energy
antifreeze: a liquid added to stop water from freezing
crystals: tiny hard pieces with sharp edges, such as ice
amphibians: animals such as frogs that live in water and on land

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: _____

The Wood Frog That Freezes Solid Each Winter

Square group

Winter is an especially punishing season for any animal that cannot generate its own body heat. The wood frog, which inhabits forests across much of North America, has no burrow deep enough to escape the cold. Instead, it settles beneath a blanket of fallen leaves and then does something that sounds impossible: it allows itself to freeze.

As the temperature drops, ice begins to form in the spaces between the frog's cells and beneath its skin. Its heart stops beating and its breathing ceases entirely. To a person who happened upon it, the frog would look like a small, stiff lump of ice. Nevertheless, it remains alive, simply waiting.

The secret lies in what happens inside the body just before the freeze. The frog's liver releases large quantities of glucose, a type of sugar, into its bloodstream. This sugar functions rather like the antifreeze in a car, staying inside the cells and preventing them from freezing, which shields them from the damage that ice crystals would otherwise inflict.

When spring finally arrives, the process runs in reverse. The ice melts from the inside outward, the heart resumes its beating, and the frog begins to breathe once more. Within a day or two it is hopping about in search of a pond. Wood frogs are among the first amphibians to call and mate each year, ready to start over the moment the world thaws.

Questions

1. Where does a wood frog spend the winter?

_____

_____

2. What happens to the frog's heart and breathing when it freezes?

_____

_____

3. What does the frog's liver release into the bloodstream before the freeze?

_____

_____

4. What happens to the frog when spring arrives?

_____

_____

5. Why does the passage compare glucose to the antifreeze in a car?

_____

_____

6. Why does the writer insist that the frog is still alive even though it looks like ice?

_____

_____

Words to know

burrow: a hole or tunnel an animal digs to live in
glucose: a simple sugar that gives living things energy
antifreeze: a liquid added to stop water from freezing
crystals: tiny hard pieces with sharp edges, such as ice
amphibians: animals such as frogs that live in water and on land

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: The Wood Frog That Freezes Solid Each Winter

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

Circle: The Wood Frog That Freezes Solid Each Winter

Easier · 192 words · Flesch-Kincaid grade 2.4

1. Under fallen leaves.
2. They stop.
3. Glucose, a kind of sugar.
4. The ice melts, its heart starts, and it breathes and hops again.
5. Both stop liquid from freezing, so the sugar protects the frog's cells.
6. Its cells are protected, and it wakes up when it gets warm.

Triangle: The Wood Frog That Freezes Solid Each Winter

This passage · 227 words · Flesch-Kincaid grade 5.9

1. Under a blanket of fallen leaves.
2. They stop.
3. Glucose, a kind of sugar.
4. The ice melts, its heart starts again, and it begins to breathe and hop.
5. Both keep liquid from freezing, so the sugar protects the frog's cells.
6. Its cells are protected, and it recovers when it warms up.

Square: The Wood Frog That Freezes Solid Each Winter

Harder · 233 words · Flesch-Kincaid grade 8.2

1. Beneath a blanket of fallen leaves.
2. Both of them stop.
3. Large amounts of glucose, a type of sugar.
4. The ice melts, its heart resumes beating, and it begins to breathe and hop again.
5. Both prevent liquid from freezing, so the sugar protects the frog's cells.
6. Its cells are protected from damage, and it recovers once it warms up.