Name: _____ Date: _____

The Frog That Freezes

Reading level 8 (4th grade) · 441 words

Could a frog freeze like an ice cube and still be alive? In Alaska, one can. It is called the wood frog. Every winter it freezes solid. Its heart stops, and it stops breathing. Then, in spring, it thaws out and hops away.

The wood frog is not big. Even a grown one is only about two inches long. It has a dark stripe across each eye, like a mask. It is also the only amphibian that lives north of the Arctic Circle.

So how does a small frog get through an Arctic winter? First it settles into a shallow dip in the ground. A layer of dead leaves covers it. Then the snow piles on top, like a second blanket. Now the frog is ready to freeze.

When the air turns freezing, the cold starts at the frog's skin. Its eyes and legs begin to freeze first. But inside, the frog is busy. It pumps water out of its cells and into the spaces around them, so there is less water inside to freeze.

Next, the frog's liver makes a sugar called glucose, and the frog pumps that sugar into its cells. The glucose works like antifreeze. It makes a thick, syrupy juice inside each cell. That juice keeps the cells from freezing and from drying out.

So the ice grows in the spaces around the cells, and not inside them. Within a few hours, ice fills the frog's belly and wraps around its organs. Flat crystals of ice slide in between its skin and its muscles, and its eyes turn white.

By now, more than half of the water in the frog's whole body has become ice. Its heart stops beating. It does not breathe, and it does not move. The frog stays in a kind of pause until spring, when it thaws.

How long can a wood frog stay frozen? For as long as seven months! Alaska's wood frogs freeze for longer than wood frogs anywhere else in North America. Imagine lying under the snow, as still as a stone, while winter goes on and on above you.

Then spring comes. In April and May, the ice begins to melt along the edges of Alaska's ponds. The frogs thaw out and come back to life. Their hearts and livers, which froze last, thaw first. Soon the rest of the frog warms up, and it can move again.

Within hours, the male wood frogs are on their way to the shallow ponds. They call out loudly to find mates, and their calls sound like ducks quacking. How does a frog that was frozen solid know when to wake up?

Questions

1. What does the glucose do inside the frog's cells?

A. It keeps the cells from freezing
B. It makes the frog hop
C. It melts the snow

2. What happens to the frog's heart when it is frozen?

A. It beats faster
B. It stops beating
C. It gets bigger

3. Where does the ice grow in the frozen frog?

A. Inside every cell
B. Only on its skin
C. In the spaces around the cells

4. Why does the book say the frog is in a kind of pause?

A. Because it stops moving and breathing, but thaws and lives again
B. Because it is asleep and dreaming
C. Because it is hiding from a bird

5. In this book, what does the word thaw mean?

A. To freeze hard
B. To melt and warm up
C. To jump away

Words to know

glucose: a sugar
antifreeze: freezing stopper
amphibian: frog-like animal
thaw: melt and warm
Arctic: far north

Answer key: The Frog That Freezes

1. A. It keeps the cells from freezing
2. B. It stops beating
3. C. In the spaces around the cells
4. A. Because it stops moving and breathing, but thaws and lives again
5. B. To melt and warm up