Grades K-5
Mini-Lesson: “How do polar bears walk on ice and snow?”

VIDEO TRANSCRIPT

VIDEO 1

Hey, it's Esther. Is it possible to swim in snow? This tiny polar bear seems to be trying. He's exploring snow for the very first time at the Toronto Zoo. Someone named Nathan has a question about polar bears. Let's give Nathan a call now.

[Video Call]

- Hi, Esther.
- Hey, Nathan.
- I have a question for you. How do polar bears walk on ice and snow?
- That's a great question.

Check out these polar bear cubs in the wild. They're taking their first steps and slipping and sliding a bit. If you've ever tried moving on ice and snow, you can probably relate. Slipping and sliding is fun sometimes, but other times it can lead to a serious wipeout. Somehow, adult polar bears make moving on ice and snow look easy. No slipping or sliding here. They can even run when they need to. For short distances, polar bears can run as fast as some of the fastest human runners. And they're running on ice. While polar bears usually move more slowly, they can still cover huge distances. Scientists at Polar Bears International tracked a polar bear and her cub who traveled over two thousand miles in ten months. That's like walking from

Washington, DC, to the US state of Utah on ice. Before I go on, I'm curious. What do you think? How do polar bears walk on ice and snow without slipping?

VIDEO 2

To understand how polar bears walk without slipping, it might help to first look at why they walk so far on ice. One big reason is to find food, especially a polar bear's most important food, seals. Seals spend much of their time in the water. They're speedy swimmers, and it's hard to keep up, even for strong polar bears. This polar bear has spotted a seal close to shore, but the seal has plenty of time to escape before he can even get close. When temperatures get colder though, the water starts to freeze and a thick layer of ice forms on top. Seals can swim below the frozen surface, but now the polar bears don't have to swim after them. They can walk on the ice instead. Polar bear search for holes in the ice where seals come up for air. Then they patiently wait, ready to grab the first seal that pops up, or they might sneak up on a seal that's resting. Or even leap across the ice. Melting cracking ice makes it hard for polar bears to hunt and get the food they need. The colder the ice, the easier it is for them to travel. And to do that, polar bears rely on their paws. Take a look. They're as big as dinner plates. All that shaggy fur helps keep their paws warm on ice and snow. Like how you might wear extra socks or heavy boots. And notice those black areas without fur, those are patches of thick squishy skin called paw pads. If you look at the skin on the palm of your hand, you'll notice that it has wrinkles and lots of tiny ridges. Look closely at a polar bear's paw pads, and instead of ridges, you'll find lots of tiny little bumps called papillae. Other animals have pawpads with papillae too, like dogs, cats, and some bears. But compared to other bears, Polar bear papillae are extra tall, and those extra tall bumps seem to be the secret to not slipping. Think about moving your finger over something bumpy. Each bump rubs against your skin. Your fingers might even catch on a bump

and kind of stick there before sliding along. A polar bear's papillae do something similar. All those tiny extra tall bumps rub against the ice and snow to give the polar bears a better grip. Since extra tall papillae works so well for polar bears, scientists hope to invent new materials that act like pepele for people. Adding tiny extra tall bumps to the bottoms of boots can help us walk on ice without slipping. Or help tires grip a snowy road. You could come up with inventions to give a better grip too. Try experimenting with things that slip and grip. If you've ever played with a basketball, you may have noticed that they have lots of tiny bumps. Would playing with a totally smooth basketball change your game? See if you can test it out, or test out different kinds of footwear. Try to figure out why some grip or slip more than others. And experiment with different ways to make them grip even better. Then think about other slippery problems, like icy sidewalks or pool decks, There are lots of situations where a better grip would really help. Maybe you can invent a new solution. That's all for this week's question. Thanks, Nathan, for asking it.