

## Your Shortcut to... The World's Toughest Animals

This is a Squiz Kids podcast - your fresh take on what's happening in the world around you

Frogs that stay buried underground for years... creatures that survive the vacuum of space... and worms that live happily in boiling acid water... This is your Squiz Kids Shortcut to the world's toughest animals—the podcast where we dive into the who, what, when, where, why and how of the big news stories. I'm Amanda Bower.

And I'm Bryce Corbett.

Lately on Squiz Kids Today, we heard about godwits, birds that can fly up to 8 days non-stop. And that got us wondering about how the toughest animals in the world have adapted to their environments, the way the godwit adapted to be able to fly from Alaska - way up the top of our globe - to New Zealand, way down in the south.

Today, we'll take you through what makes five of the world's animals so tough; how they got that way; and why we humans should care.

Listen carefully - there's a S'quiz at the end!

Bryce, I wish we had 20 minutes for this podcast, because there are SO many tough animals out there I want to tell you about! But I'm going to keep it quick, and I'm going to cover my top five. Ready?

Ready

Okay, at number five, we have my least favourite, the cockroach.

Yeuch. I suppose that's because they can survive a nuclear explosion, right?

Actually, Squiz-E the Newshound told me that's a myth. But cockroaches are ridiculously tough. They can withstand 900 times their bodyweight... (pause for FX) imagine if you weighed 40kg and someone put 36,000kg on your back.

Yikes! No wonder they're hard to kill.

Alright, coming in at number four is... (pause for FX) the frogsicle.

The what??

Technically it's called the Alaskan wood frog. If you have a pet frog, you may know that their terrarium needs to be kept at around 25 degrees. But in Alaska, it's lower than zero degrees - the freezing point of water - for seven months of the year. As temperatures start to drop, our tough little wood frog begins to produce an incredible amount of wee. Instead of going to the toilet, it holds onto that wee in its blood. At the same time, its liver begins pumping out more than ten times the usual amount of glucose — that's natural sugar. The glucose mixes with the urine, and that concoction packs into the frog's cells, preventing them from dehydrating as the frog freezes solid.

Wait - it freezes solid? Is that why you called it a frogsicle?

Yep. If you picked it up, it would be frozen like an icicle. But once spring is in the air, the frog thaws out, its heart restarts, and it hops away, ready to live large for five months before starting the process all over again.

Wow. That is tough. Is there a tough summer animal?

For this one, we get to head to Australia, and another frog! The eastern water-holding frog uses its hind legs like shovels to bury itself underground. It creates a bit of a cocoon and can stay there for years, until it rains again. Aboriginal people once saved the life of an early explorer who was dying of thirst, by digging up a frog and gently squeezing it to release the stored water... but that's only something that was done in an absolute emergency, because unless the frog can replace the water quickly, it will die.

Wow. So we've had cold, drought... what about heat?

For the toughest heat-handler, it's hard to go past the Pompeii worm...

Named, I guess, after the city that didn't survive the extreme heat of lava...

That's right - but these worms don't live in Italy, they're deep in the Pacific Ocean, right beside super-heated acidic water that's coming out of vents from the centre of the earth.

How hot are we talking?

300 degrees! They stick their feathery heads up out of the tubes they live in to feed from slightly cooler water. They have a sugary mucus that oozes out over their backs... yum... and attracts bacteria that feed on it. Those bacteria also insulate the worm. So, it's a bacteria blanket.

Wow. Not the kind of blanket I want to keep me cool.

Finally, Bryce, we come to the toughest creature of all... the practically indestructible tardigrade.

Tardigrade? What's that?

Tiny microscopic creatures. There are around 1,200 species of tardigrade, and the ones that live on land survive droughts by sort of shrivelling up ... and can survive that way for THIRTY YEARS. If wetted again, they come right back to life. When they're in that shrivelled state they can also survive temperatures as LOW as -272 degrees; they can resist radiation, and can even survive the vacuum of space.

Is there anything that CAN kill them?

Well, although they can survive heat of up to 150 degrees, that's only for a short period of time. So strangely, Bryce, scientists say that climate change—which will be a long, slow increase in temperatures—might threaten these incredibly tough animals.

Animals are affected by the physical conditions of their environment, that's for sure. But I'm wondering, Amanda... HOW did these tough creatures get that way?

Well, Bryce, all living things have adaptations that help them survive in their environment.

I know that if a person is adaptable, it means that they're willing to change... a bit like being flexible.

It's a bit different when we're talking about biology, because animals can't CHOOSE to adapt, the way that you make a choice when you agree to watch a show that your sister wants on TV. Adaptation is a process that takes place over generations... it's where an organism, or living thing, slowly becomes better suited to its habitat. Here's an example: once upon a time, some giraffes were randomly born with slightly longer necks. Those giraffes were able to reach more food, which meant they were more likely to survive, and more likely to reproduce, or have babies. And then those babies also had longer necks, and were more likely to survive... and slowly, over generations, all giraffes ended up with long necks. That's called evolution, and all of our tough animals have EVOLVED to survive their extreme environments. In fact, there's a word for them... extremophiles...

This week, you'll be reading about different species of other animals, and figuring out which of their features are likely to be an adaptation to their environment. Get ready to go to the Galapagos and other amazing places.

Love it! So other than being extremely cool to learn about, WHY should humans care about extremophiles?

Bryce, there are lots of examples of scientists studying extremophiles' adaptations, and trying to learn from them to help humans, too.

We're running out of time, so give me just one example.

There's a lizard called the Gila monster that lives in the US and Mexico, and is one of only two species of lizard in the world that produces venom. It's cold blooded, of course, so in the winter it buries itself underground and sort of shuts down to hibernate. When it starts to get warm, that venom is released into its body to wake everything up again.

It poisons itself?

Sounds that way, but the venom is a kind of hormone that gets everything running properly. Scientists discovered that it was a lot like the human hormone that makes our bodies produce insulin... that's what kicks in when we eat sugar.. and they've now developed a drug to help people with diabetes, who don't make enough insulin themselves.

That's an extremophile being extremely helpful.

Exactly.

"This is the part of the podcast where you get to test how well you've been listening...

Question 1 What animal can withstand up to 900 times its bodyweight? (cockroach)"

Question 2 What two things does the frogsicle produce a lot of, so it can freeze itself and survive? (wee and sugar)

Question 3 What's the word for things that animals have evolved that allow them to survive in their environment? (adaptation)

That's all we have time for today. Thanks for joining us as we explored the who, what, how, where, when, and why of the world's toughest animals.

Now get out there, and have a most excellent day!

Over and out.