But Why: A Podcast for Curious Kids

How do lizards grow their tails back?

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Jane 00:19
This is But Why: a Podcast for Curious Kids from Vermont. Public I'm Jane Lindholm. On this show, we gather all kinds of questions from all kinds of kids from all kinds of places, and then we gather a few of the questions and present them to someone who might at least have some of the answers. Today, we've gathered questions about one specific type of animal, and we're going all the way from Vermont to San Diego to get those answers for you. The animals we're going to learn more about today are lizards. Here in Vermont, where I live, we only have one type of lizard. In fact, there's only one type of Lizard that lives in all of New England, the region Vermont is part of. It's called the Five lined Skink, and it's endangered here in Vermont. It's only found in two towns here, and I've never seen one. I love lizards. That probably comes as no surprise to those of you who have listened to a lot of episodes. I think I say I love the animals we're about to talk about in every animal episode we make. But since we don't have many lizards in my neck of the woods, I took advantage of a recent work trip to California and made a beeline for a place that has lots of lizards, like thousands of them. But here's the rub, the lizards in the place I visited are not alive. I went to a museum with a research facility where they study reptiles and amphibians and they preserve specimens of each species so they can study them even after those individual animals are dead. Let's go there right now.

Adam 01:52
This is the vault. So this is the deepest part of the whole museum. We're about three floors underground right now, and the room is sort of divided into two halves. So the half off to the left here, this is all of the wet, preserved invertebrate collections, and then everything on the right hand side of the room facing me, these are all the reptile and amphibian specimens that I manage as the Collection Manager of Herpetology here at the Natural History Museum.

Jane 02:19
So to give kids a little bit more of a sense, when you say the specimens you manage, we are talking not about live animals.

Adam 02:27
We are not so we're talking about all animals that were once alive but which are now dead and preserved. So these are not replicas. These are all real animals that were once alive. And you can sort of think of a collection like this as a library, where, instead of books in my library, we have preserved specimens. And so just like a book, you can open up every specimen in every jar in this room, and you can read it like a book. You can look at what that specimen was eating before it died. You can look at what kinds of parasites it might have inside its body or on its body, like ticks or parasitic worms. And we can track change across space and change across time. So there's so many different things that we can learn from dead animals that help us to better protect and understand how to conserve them in the

wild. And so it's a really powerful resource. It's, I tell people, it's sort of like drowning in chocolate for me to be in this room.

Jane 03:13
It's a little bit weird to say drowning in chocolate when you're also talking about like dissecting animals and seeing what they ate and what ticks they have on their body.

Jane 03:25
Okay, yeah, I still think it's weird to associate chocolate with preserved reptile specimens in jars of alcohol. But who am I to yuck, someone else's yum? And this, someone else we're talking to here is Adam Clause. His official title is collections manager of herpetology at the San Diego Natural History Museum. But sometimes it's hard to understand what someone does just from their title. So I asked Adam to explain what his job actually is.

Adam 03:55
So I get to basically be a kid as an adult. So when I was about the age of many of you who are listening right now I was catching lizards in my backyard in Southern California, and I was marking them with different dots of colored paint so I could tell which one was which and how many are in my in my yard. And so I kind of get to do that all the way to today as an adult, I get to go out outdoors, outside in wild places, and sometimes in suburban areas. And I get to catch lizards. I get to catch snakes. I get to learn about them, and then I get to share that information with everybody through scientific publications. So writing down what I see, interpreting what I see, and then sharing those results, what I'm learning with the world.

Jane 04:33
In addition to going out and looking for wild animals, Adam also keeps track of all those specimens we were looking at when I visited the museum. You heard him mention that we were deep in the bottom of the museum. It's a big, climate controlled room that has almost 80,000 specimens or preserved animals. The specimens are stored in jars that are filled with liquid, usually a kind of alcohol, that preserves the animals so they don't decay or deteriorate. They're mostly in jars with white lids that kept reminding me of pickle jars, some small pickle jars and some other really, really big pickle jars, except instead of pickles, the jars were full of rattlesnakes and turtles and other things that were definitely not pickles. Most of the animals in the collection come from the local area, Southern California and the Baja Peninsula of Mexico. They have over 1,700 different species of reptiles and amphibians in the collection.

Adam 05:30
And by reptiles and amphibians, just to be clear, we mean things like crocodilians, snakes, lizards, turtles. We have one tuatara and then for amphibians, those are the three main groups, are salamanders and newts, frogs and toads. And then the really weird group that almost nobody's ever heard of. They look like giant earthworms, but they're not earthworms, they're amphibians, and these are called the caecilians, and they are strictly tropical, so we don't have any in our region or any in the US, but we have a few specimens in the collection.

Jane 05:59
Before we got to the questions, I was there to ask Adam about, all of your lizard questions, I asked him if he could show us something in the collection.

Adam 06:07
How about we open up a tank? Yeah. And so in the room, as we mentioned, most of the specimens are kept in jars, but glass jars usually don't get manufactured much larger than one gallon in size. So if we have specimens like really big iguanas or really big snakes that just don't fit inside a gallon jar, we have to have another way of storing them. And our solution is these steel tanks that we fill with fluid and we store the animals in there. So I'm going to open up one of these tanks right now.

Jane 06:41
This is tank 10, and it says on top of it, iguanids, yes.

Adam 06:46
So these are like iguanas. And then we have a Gila monster. And then, weirdly enough, we have a few Galapagos, tortoise feet, just the feet, not the shell, just the feet.

Jane 06:57
Wow. The smell is really distinct when you open it up, yep. So it smells, if you're an adult, kind of like sherry,

Adam 07:03
Sure. So it's actually the exact same chemical that you know adults drink in their alcoholic beverages. It's ethanol or ethyl alcohol. So it's not toxic, per se, but the way it preserves the animals is it just makes a solution, a mixture of ethanol and water that bacteria and fungi cannot live in. So if a bacterial cell were to get dropped into this fluid, all the water would get sucked out of it and it would die.

Jane 07:26
So if I coughed into it, it wouldn't damage anything.

Adam 07:27
It wouldn't damage anything at all. Yeah.

Jane 07:31
So what do you do with these iguanas that are preserved in here? They're very it's very cool looking. They're sort of, some of them are preserved where they're sort of curved around their own tails.

Adam 07:41
So we can do all manner of things. People can study the genetics. We can look at their DNA. We can look at how their coloration varies between males and females. We can look at how coloration might vary in certain parts of their distribution versus others. We can cut them open if we wanted, and see what they were eating. We can cut them open and see what kinds of parasitic worms might be living in their bodies, and sometimes those can be brand new species that nobody's ever described or given a

name to. We can do so many things. It's almost an unlimited number of questions. And what's really fascinating about collections like these is that they're super long term. So these, a lot of these specimens are decades old. Some of the specimens in our collection are more than 150 years old. And so what that means is these specimens could be potentially used for things in the future that we don't even have any idea, that we could even ask these questions now.

Jane 08:34
I'm glad you showed me the iguanas, because what we're here to talk to you specifically about today are lizards. And iguanas are a kind of lizard. So can we share some of the questions from kids that we got about lizards?

Adam 08:46
Yeah, let's do that.

Jane 08:47
Maybe you can explain, since we were talking about reptiles and amphibians, what lizards are?

Adam 08:53
Sure! So lizards are vertebrates, so they have backbones, just like we do vertebral columns, and they're also characterized by usually having very scaly skin, and so that helps them to avoid drying out, so the scales help keep the moisture inside their bodies. And so a lot of reptiles like lizards, they can live in really, really hot, dry places like deserts, because of how the skin keeps all their water in their bodies.

Jane 09:19
So lizards are reptiles, not amphibians. That's correct. Some lizards look a lot like salamanders, but salamanders are amphibians, so and salamanders have scales, right? Or do the skin not have scales?

Adam 09:36
That gets back to what defines a lizard, so those scales are the big differentiator. So salamanders are going to have smooth, sort of wet skin, or at least moist skin, somewhat similar to ours, versus a lizard is always going to have scales on its skin. That's the big separating, or the big that's the big differentiator between those two groups.

Quentin 09:56
Hi. My name is Quentin, and I am six and a half years old, and I live in Alaska, Anchorage, and my question is, why do lizards have scales?

Rowan 10:13
Hi, my name is Rowan. I am six years old. I live in Houston, Texas, and my question is, why do lizards have scales?

Finn 10:23

My name's Finn and I'm five years old, and I live in Raleigh, North Carolina. I want to know why do lizards have scales.

Finn 10:38
My name is Artis. I live in Torquay, Australia, and my and I'm six, almost seven. And my question is, why do lizards have scales?

Jane 10:51
Can you go a little deeper into the scales of lizards?

Adam 10:54
Yeah, so it really helps them to live in a lot of different habitats that would otherwise be very difficult for them to live in. The deserts, as I mentioned, are one of the prime examples. Deserts are very hard places for animals to live in, because they're so dry and because they're so hot, and so when you have a protective layer of armoring over your skin, like scales, which is what lizards do have, that opens up a whole realm of possibilities for places on the earth that they can live in and maybe avoid competition from other species that don't necessarily have those protections on their skin, and so that gives them the ability to live in places with less competition.

Jane 11:31
You also mentioned the scales help them keep moisture in. How do scales do that?

Adam 11:36
So you can think of scales as sort of they're very similar to your fingernails, so they're hard, they're impermeable to water, and so water doesn't travel through the scale the way it does through your skin. And so that's basically how it works. It's like a barrier. That's a good way to think of it.

Evelyn 11:53
I'm from Quebec, Canada, and my name is Evelyn. I'm six years old, and why are lizard cold blooded? And why are people not cold blooded too?

Adam 12:09
This is a really, really great question, and I'm glad that you asked this one so it's actually not true. Technically, that lizards are cold blooded. The way it works is the big differentiator between lizards and say, humans, is that we maintain our body temperature, and hence our blood temperature at a really consistent temperature, and we do that which part of the reason we do that is to make sure that all of our organs are at the sort of the same optimal conditions for operating.

Jane 12:36
So if I go sledding in Vermont and it's one degree Fahrenheit, my body temperature is still staying around 98 and then if I come here to San Diego and I hike up the hills at 80 degree weather, my body temperature is still right around 98 degrees.

Adam 12:51

That's right. But if you were a lizard and you went from the Arctic to the deserts, your blood temperature and your body temperature would mimic whatever the surrounding temperatures are. So sometimes that means that lizards blood temperatures are quite cold, and other times it can mean that their blood temperature is quite a bit warmer than ours. So on average, yes, their blood tends to be a little bit colder than ours, but it can also be quite a bit warmer than ours. So it's just their blood is not it's not at a fixed temperature the way humans and mammals are their blood temperature varies according to the environment.

Jane 13:25
I thought that's what cold blooded was. So why do you say they're not technically cold blooded? But it's this is like science that goes against what I was taught as a kid.

Adam 13:34
So it depends on what you mean by cold, right? If cold means colder than human blood, then it's not true, because there are many lizards, in many contexts that can have blood temperatures well over 100 degrees. And so that's it's hard to argue that that's cold blood in that particular context. It's just that their blood temperature it varies. It's not consistent.

Jane 13:54
I see so it's almost like it's just that a bad name for the way we regulate our temperature, or the way they regulate their temperature.

Adam 14:01
That's right, it's kind of an over-simplification of what they do.

Jane 14:03
Got it. Phew. I was gonna have to review my whole, you know, world view here. If that was not the case, we have another question from Grayson.

Greyson 14:13
I'm Greyson. I'm five years old. I live in Pittsburgh, Pennsylvania. My question is, do chameleons sleep or hibernate? Because in the Wildcat how I saw them awake at night.

Jane 14:30
So Grayson wonders, do chameleons sleep or hibernate? How do lizards think about those two things, which are quite different.

Adam 14:39
They are quite different. So hibernation is typically something that a lizard is going to do if it lives in a really seasonal environment, where, if it gets really cold during the winter and much warmer during the summers, during the winter, the lizard might cease or stop most of its activity. Its blood temperature will get quite cold, and it won't really be running its metabolism anymore. So. Won't need to feed. It won't need to eat, and they'll just sort of let go into a long sleep, roughly analogous to what like a bear does during the winter, right? But if you're a lizard that lives in a more warm or a more stable environment,

you can be active all year round, and you never really have to hibernate. Sleeping is a different matter. So sleeping is something that pretty much every vertebrate needs to do at some point on a daily cycle. And lizards are no different. So all lizards have to sleep, similar to the way humans have to sleep.

Jane 15:28
So specific then to chameleons. Yes, they sleep, and are chameleons hibernators.

Adam 15:35
Most chameleons live in pretty warm climate. I think most chameleons, it's safe to say, do not hibernate, but there might be some that do. I'm not sure. The other thing to keep in mind is that some lizard species are fully nocturnal, so they're sleeping during the day and being out and about, foraging and looking for food and looking for mates at night. So that's the other important thing to remember when we're talking about lizards sleeping, is they don't all sleep at night. Some of them sleep during the day.

Jane 16:01
I looked this up Grayson, and it appears that chameleons are generally not known to be nocturnal, but I've seen the Wild Kratts episode you're talking about, and there is that chameleon in the dark. That episode, though, also features another animal, a type of lemur known as an aye aye, and that animal is nocturnal, so maybe the Wild Kratts took some artistic liberties to make the episode work.

Julian 16:25
I'm I'm Julian, I'm five. I'm from Houston, Texas, and my question is, why do lizards can stick their tongue out to their eye, and we can't.

Agatha 16:43
My name is Agatha. I'm a six year old, and I live in California. My question is, why do lizards and snakes and other reptiles stick their tongues out very often?

Jane 16:56
Tell us about lizard tongues?

Adam 16:58
Yeah, so there's a couple things going on there. So first of all, only a few lizard species can actually lick their eyes. Most lizards, in fact, cannot, any more than most humans cannot lick their eyes, right? But a lot of Geckos can. And part of the reason why they do this, I'm generalizing a little bit here, but part of the reason is that a lot of geckos have a thin, transparent scale that covers their eyes, and so they don't have eyelids, and so to clean their eyes, to clean the scale that covers their eyes, they don't have eyelids to do it. So they've co opted their tongue to do the work for them. So it's basically they're cleaning their eyes. Is the reason why they lick them.

Adam 17:35
Is that eye scale different from a nictitating membrane that some animals have that can come down and protect their eye, but is different from an eyelid.

Adam 17:44
It's very different in the sense that the scale is not related to an eyelid structure at all. It's it's a scale just like any other scale on the animal's body, except it's transparent.

Jane 17:53
So they can see through it.

Adam 17:55
They can see through it. Yeah. And that's also the case for snakes. Every snake has the same, the same type of eye. They have a transparent scale covering the eye, and this is why some people don't like snakes when they see them, because they think they have this rigid, unblinking stare, right? It's because they literally can't blink. They don't have eyelids.

Jane 18:13
So when a snake is about to shed its skin, sometimes its eye looks cloudy. And is that because it's it's sort of separating all of its scales from its body?

Adam 18:23
Exactly so, because the scale over the eye is just like any other scale, it gets shed when the snake sheds its skin, and during that process, a very thin layer of moisture gets produced between the new skin and the old skin. And when you're looking at the eye, you're basically looking at that cloudy moisture separating the two scales, and it's only once the old scale gets left off that the transparency comes back.

Jane 18:45
But lizards don't shed, or do they?

Adam 18:49
They absolutely shed. All lizards shed their skin, just like snakes do.

Jane 18:53
So you might see a lizard with a foggy eye too.

Adam 18:56
If it's one of the lizards that doesn't have eyelids, that's a possibility.

Jane 19:01
Okay, so back to their eyes, so and their tongues is where we were really supposed to be going. So some of them can lick their eyes, but most can't. So what do they use their tongues for?

Adam 19:11
So they use it for similar things that we use it for, for sort of manipulating food and moving food around within their mouths. Other species or groups like chameleons, for instance, have highly adapted

tongues where they're shooting the tongue way outside the mouth, and the tongues are very sticky, and they glom on to a prey item, like a cricket that they want to eat, and then the tongue pulls that cricket back into the mouth. That's sort of an extreme case. And then another purpose for the tongue is that a lot of lizards use it to sense smells in their environment. So they're using their nose similar to the way we use our nose, but the tongue is sort of the secondary sensory mechanism where they're detecting smells by sticking their tongue out and tasting the air or tasting the ground, as the case may be. So multi- purpose tongues for a lot of animals.

Jane 19:59
Do lizards have forked tongues?

Adam 20:02
Some do and some do not. So it depends on the group of lizard. So you can imagine a Komodo dragon, for instance, they have very deeply forked tongues. But your Bearded Dragon, which you might have as a pet at home, they have just a tiny, tiny little fork at the tip of the tongue, but it basically looks like your tongue, unless you're looking really closely.

Jane 20:19
Do you know how many kinds of lizards there are?

Adam 20:22
There are over 7,000 described species of lizards, and there are more being described every day. And so that's something that I do as part of my work as a scientist. So I've participated in the description of three new lizard species in my life, and we're working on a couple more right now.

Jane 20:37
That's so exciting. What does it feel like to find a new lizard that hasn't been as you as you say, described before, that, you know, human. That doesn't mean that that humans didn't know about it before, but it hasn't been put into the scientific record. What is it like to do that?

Adam 20:53
It feels really cool. It's a real thrill. So one of my childhood dreams was to do this when I was the age of many of you listening right now, I wanted to describe new species when I was a boy, and so when I turned 30, I was finally able to do that.

Jane 21:07
What did you name them? Did you get the naming rights?

Adam 21:09
Absolutely. So we were part of a team, so it wasn't just me. And so the team agreed for this particular lizard. We wanted to call it the Sierra Morena arboreal alligator lizard. So it's kind of a mouthful, but they're very cool lizards that live up in the forest canopy, and that's part of the reason why this one went undiscovered for so long, is because they're really out of sight of where most humans are when they're walking in the forest.

Jane 21:33
What about its scientific name?

Adam 21:34
Scientific name is abronia marinica.

Grace 21:38
My name is Grace, and I'm five years old, and I live in Tempe, Arizona, and my question is, how do lizards stick to things?

Nicholas 21:49
Hi, my name is Nicholas. I live in Halifax. I'm six years old, and my question is, how do lizards attach to walls?

Adam 21:57
So it's a little bit complicated, and I will just say that it's not the same type of sticking that is like when you think about stickiness, like if it's a post it note or tape, it's not that way on the lizard's feet, they don't have technically sticky toes. What they do have is toes that have these really big patches on the underside of the toes that have all these teeny, teeny, tiny hairs. And those hairs increase the surface area of those toe pads, they're often called. And so when they touch a surface, they have all this surface area from the toe that's contacting whatever it is that they're touching. And there's these very strange forces that only apply in really small distances, and they're called Van der Waals forces. It's a very complicated name, and basically these Van der Waals forces are what allow geckos to stick, quote, unquote, stick their feet to the walls.

Jane 22:53
So they don't have suction cups.

Adam 22:55
They do not have suction cups. A lot of, some frogs do, and they frogs use a suction cup action. But with lizards, it's a very different style of stickiness.

Jane 23:03
And not all lizards can stick to walls.

Adam 23:05
Goodness, no. There's actually only a small subset of lizards that can stick to walls. Most lizards cannot climb walls like that.

Jane 23:12
Coming up. You may have heard that lizards can lose their tails and then grow new ones. Is that true? Stay with us.

Jane 23:21
This is But Why. I'm Jane Lindholm, and today we're learning all about lizards with Adam Clause, who manages the reptile and amphibian collection at the San Diego Natural History Museum. We did the interview down in the basement of the museum, where 80,000 specimens are preserved in jars full of liquid for scientists to be able to study and learn from them. Adam has been answering all kinds of lizard questions you've sent us. So let's get to some more.

Jane 23:46
Lizards are famous for being one of the kinds of animals that sometimes loses their tail and can grow it back. And we have a lot of kids who are wondering how they do that.

Rahan 23:59
Hi, I'm Rahan. I live in Jakarta, Indonesia. I'm six years old, and my question is, how do lizards grow their tails back?

Luis 24:14
Hi, my name is Luis. I am 11, and I live in Fort Collins, Colorado. And my question is, how do lizards tails grow back?

Lenka 24:21
Hello. My name is Lenka. I'm seven years old. I live in the Czech Republic, and my question is, when lizard's tail falls off why does a new one grow?

Thomas 24:32
My name is Thomas. I'm four years old. I live in Pennsylvania, Harmony and my question is, why do lizards lose their tails?

Adam 24:46
So not all lizards can, can break their tails, or at least not intentionally, but many lizards can, and they do it as a defense mechanism, as a way to escape a predator. So you can imagine, if you know a dog or a cat were to attack a lizard. Bird and just grab it by its tail, the lizard would want to sort of separate itself from the tail, which is somewhat disposable, right? It can live without its tail, and then it can use that mechanism to sort of escape while the dog or the cat or whatever it is that attacked, it is focused on the tail. And so most lizards that can lose their tails in that way, on each on each bone of the tail, each vertebra, there's actually a crack, and that crack serves as the point where that tail will break if you squeeze it or grab it really tightly. So they're adapted to lose their tails. It doesn't really hurt them. They bleed very little when this happens. And in fact, the muscles at the tip of the tail where the break happens, they all clench down and prevent a lot of blood loss. So it's not great for the lizard, but they've adapted to where it's not this, this, this potentially lethal event in their lives. And then they regrow their tails because a lot of lizards use their tails for things like balance when they run or balance when they're climbing, they'll often use it as sort of a device or a way for males to signal their health to females. And so having a full tail is really important to some lizards for reproduction. And so the way they regrow it is they don't regrow the bone. They can never regrow the bone, but what they can grow is like a little cartilaginous rod that grows out and has a little bit of muscle and soft tissue around the

edges and scales on the outside for the skin, but the regrown tail never ever looks exactly like the original. So you can always tell when a lizard has broken off its tail if you look really closely, because the scales aren't the right size, the scales aren't the right color, and there's no bone inside. So if you X ray a lizard, you can know for sure if a tail is regenerated, because the bones will just stop and then it's just cartilage from then on.

Jane 26:46
Cartilaginous is one of my favorite words. It's such a good word. And if you if you want to think about what is cartilage versus what is bone, you can feel in your nose, the part that wiggles, but is a little bit hard that's cartilage. Or you have cartilage in the top of your ears, and you can kind of bend it, but it still gives your your body part, that structure.

Adam 26:46
Yeah, that's right. That's exactly right.

Talia 27:06
Hi. Mine is Talia. I'm six years old. I live in Marina, California. My question is, why do lizards have different teeth than humans?

Adam 27:21
So it's mostly related to their diet. So if you have an herbivorous lizard, it's going to have teeth that are going to be slightly different, for shearing off and then chewing up leaves or vegetation, versus a lizard that might be feeding on insects and it needs to sort of capture its prey and hold on to it with much larger, sharper teeth. So it really all depends on what you're eating. Humans sort of have a mixture of teeth, right? We have a couple sharp teeth in our mouth, and then towards the back we have our molars, which are better for grinding food. And so we're well adapted to sort of eat both meat and plants. But most lizards don't do that, sort of that breadth of what they can eat. They sort of specialize on one type of prey or another, and so their teeth just reflect that that diet.

Jane 28:07
Are some lizards carnivores?

Adam 28:09
Most lizards are. There's very few lizards that don't eat any meat, per se.

Jane 28:15
Yeah. All right, so here's one that we always have to answer for every animal, because it's just, I don't know, I think it fascinates us.

Maeve 28:22
Hi, my name is Maeve.

Adult 28:23
How old are you?

Maeve 28:27
Six years old.

Adult 28:28
Where do you live?

Maeve 28:33
Massachusetts.

Maeve 28:35
My question is do lizards poop or pee, or do they have a combined?

Iris 28:47
My name is Iris, and four years old, and I live in Rupert, and my question is, why do lizards poop?

Adam 28:58
All lizards poop and pee. I can say that unequivocally, no exceptions. The weird thing about their pee is that most lizards do not pee a fluid the way we do their pee is actually a solid, sort of chalky white or whitish yellow substance that's called uric acid. And so they do that to help reduce the amount of water that they lose from their bodies. And so this is particularly common in lizards that live in hot, dry places, because pee creates a lot of water, and water is really valuable if you're in the desert, so you don't want to lose a lot of your body's water by peeing. And so what lizards do instead is they concentrate their urine down to this chalky white substance, and that's how they get rid of their nitrogen waste, instead of using water to dilute the nitrogen waste and expel it from the body. Poop is just kind of poop. It's the waste materials, or the materials that an animal can't digest in its in its stomach or in its intestine, and so it's just pooped out as waste.

Adam 29:54
What color is tha?

Adam 29:55
Typically brown, but it can depend. Yeah, it can depend.

Jane 30:01
When I got here to San Diego from Vermont, and I knew I was going to come and talk to you, I was on a mission to see a lizard as quickly as possible, and I landed at night, so I didn't have a chance at night, because we talked about how they're not going to necessarily be out as much in the in the night, when it's cooler, and then in the morning, I went for a walk, and I saw a Western fence lizard. Tell me about those.

Adam 30:24
So they're really great lizards. I think you may have heard me talk about earlier, the lizards that I was catching in my backyard as a kid growing up. That was the lizard. So they're often sometimes called

Blue bellies, because on the underside of their bellies, the males, in particular, the boys, they will have these bright blue patches, and they use those to signal both to other male lizards, hey, this is my territory, stay away, as well as to signal to female lizards. Hey, I might make a good mate. I'm really healthy and vigorous. And so what they do is this really distinctive display that we call the push up display. So they will sort of push their belly out so that it's sort of flattened. And then they will literally do push ups from their front legs to show off their bellies to any other lizards that happen to be standing by.

Jane 31:09
Well, that lizard was either not a male or not impressed by me. It did not do any push ups.

Adam 31:13
Sometimes they'll even do push ups at people, if they sort of feel threatened and they're like, Get away from me. This is my territory. They'll push up at you. They're very, very spunky.

Jane 31:21
What are some other cool lizards that are native to this area in the southwest, Southern California and Mexico? The Baja Peninsula.

Adam 31:28
There's so many. It's Southern California and the Baja Peninsula are some of the best places to be a lizard biologist, because there's so many different types. One of the most famous one is a lizard that some of you may have heard of. It's called the chuckwalla. So this is the second largest lizard species in California. They're about the size of a bearded dragon, and similar to a bearded dragon, they're sort of plump, right? They have a big belly. They're strict herbivores, so they're only eating plant material, and they like to live in rocks, specifically like rock crevices. And so when chuckwalla's feel threatened, they will enter a rock crevice, and they'll wedge themselves as deeply as they can, and then they'll gulp air into their lungs, and they'll blow up their body like a balloon with air in their lungs. And by wedging themselves in with that air pressure, it's impossible to pull them out unless you do what the first peoples or the Native Americans would have done, because these are such large lizards, they have really meaty legs, so there's a lot of dietary value in a lizard like that. So they would take chuckwalla sticks, basically a sharpened stick, and they would pop the chuck wallahs like balloons, and then pull them out from the rocks. Yeah. So that's one.

Jane 32:35
Good technique.

Adam 32:35
It is a good technique. It worked. It worked. And you can find them in the deserts of Southern California, as well as in parts of Arizona, Southern Utah. So they're pretty widespread. Another really popular lizards, or type of lizard, is the banded gecko. So these are much smaller lizards, unlike the chuckwalla, which are active during the day, the banded geckos are mostly active at night. And if you go and drive slowly on desert roads in the spring and summertime, you can find these geckos crossing the roads,

walking along. And they're also pretty special, because if they feel threatened, they can squeak, they can actually vocalize. Very few lizards can do this, but banded geckos are one of them.

Jane 33:16
Geckos are kind of famous for their vocalizations, right?

Adam 33:19
Yeah, a lot of geckos can squeak. Yeah.

Adam 33:21
Geckos are very cool, but so are a lot of other kinds of lizards. We're going to end today's episode here because it's already getting really long, but we're going to come back with a bonus episode next week where we can get really specific about some extra cool kinds of lizards, and your questions about them, like, how do chameleons change color? What's a Komodo dragon, and how did it get that name? What's the smallest lizard in the world? And have you ever heard of a tuatara, looks just like a lizard, but is it? Adam Clause, who manages the reptile and amphibian collection at the San Diego Natural History Museum, will be back to answer even more of your questions in that bonus episode. As you know, you can ask us a question on just about anything. Have your adult help you record you asking the question. They can use one of the free voice apps that comes on a smartphone. And if you aren't able to talk, or you don't want to share your voice, you can have your adult type out your question, then send it to questions@butwhykids.org. We really wish we could answer all of your brilliant and thought provoking queries, but we do listen to them, and sometimes, like in this episode, we come back to them months or even years after you've sent them. It's hard not to get them answered right away. I know, but did you know we have more than 20,000 questions we are trying as hard as we can to get to as many as we can. But Why is made at Vermont Public and distributed by PRX. Our producers are Sarah Baik, Melody Bodette and me,Jane Lindholm, Joey Palumbo is our video producer, and Luke Reynolds wrote and performed our theme music. If you like our show, please give us a review or a like on whatever platform you use to listen to us. We'll be back in one week with an all new episode. Until then, stay curious.