But Why: A Podcast for Curious Kids

Do earthworms have eyes?

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00:00
(But Why Intro Theme Music)

Jane 00:20
This is But Why: A Podcast for Curious Kids, from Vermont Public. I'm Jane Lindholm. On this show, we take questions from curious kids all over the world on any topic you can think to be curious about, and we find cool people who can help us get the answers. Today we're going to talk about something that I bet some of you find really interesting and exciting, and some of you might feel a little...less enthusiastic about. Some of you probably enjoy not just looking at the subject of our conversation, but actually touching these things as well. And some of you would rather do almost anything than touch one of these. Do you have any guesses of what we're going to be discussing today?

Jane 01:04
Let me give you a better hint: we're going to be talking about animals, but these animals don't have any legs or any eyes or any tongues or any ears. They do have little hairs, but you can't really see them unless you've got a microscope. And you're likely only going to see the animals themselves if you're digging around in the dirt, or on a rainy day when they come up from the ground and wiggle around up on land. You've probably guessed it by now: earthworms! So, are you in the "Yay, earthworms!" camp. Or the "Gross, not earthworms!" camp? I will confess that I'm somewhere in the middle. They're not my absolute favorite animals, but I do find them pretty fascinating. And they're really important. So my job, and my guests' jobs today are to convince you to like earthworms by the end of this episode. Or, if not like them, exactly, at least appreciate them for the amazing creatures they are. Let's wriggle right in. We're going to talk today with a scientist named Sam James. Sam is well known in earthworm circles (and yes, there is such a thing), partly because he has actually officially identified about 200 different species of earthworms! That's basically his job.

Sam James 02:24
We've all seen earthworms, probably, you know, most frequently digging in the garden, coming out where we can see them after a heavy rain. And we think there's just earthworms. But there's actually thousands of different kinds of earthworms. And even in places that are not remote and far away and exotic to wherever you happen to live, there are probably unknown kinds of earthworms relatively close by. So, for example, I'm in Iowa, USA. I have, in my collection, unknown species. That is, don't have a scientific name, have not been identified and described as a new species. So by new species, we simply mean as yet undiscovered or just discovered. And I could do the same in Brazil, Thailand, Ghana, Kenya. So that's what I do. I go and I try to find those and then I document that they are there.

Jane 03:33
So you're sort of like an earthworm detective.

Sam James 03:36
You could say I'm an earthworm hunter, but also the detective part is you have to know that what you're seeing is either a previously known species of earthworm or it's a new one that no one has described before. Now I should say that almost everywhere I've gone, the people who live there know there are earthworms. You know, they see them on the paths in the forest, they see them crossing their roads or whatever. They know they're there. To them, it's just, you know, "That's the earthworms that live here." On many, many cases, those are earthworms no earthworm scientist has has ever seen before. So that's what we're talking. It's new, but it's not. It's been there all along, thousands of years, and yet it has not yet reached the attention of the science types like me.

Jane 04:32
That's pretty fascinating, because when we think about an undiscovered species, that doesn't mean it's never been seen by humans, or that humans don't know about it. But often it means it hasn't been studied; it hasn't been officially named; it hasn't sort of been officially put into a record as: this is what this species is, and this is how it's different from any other species, and this is what we're going to call it. But you make a really good point, Sam, that that doesn't always mean that other people don't already know about it, and they might have names for it.

Sam James 05:05
Yeah, exactly. I or my colleagues have used local names, indigenous peoples' names, when we do put up the official description and the official scientific name. And yet, you know, sometimes the local name is just earthworm in their language. So you kind of have to think, well, you know, we got 10 different kinds of earthworms from the mountain in your backyard, so we can only use that name once.

Jane 05:35
What is a worm? And how are we identifying earthworms as different from other kinds of worms?

Sam James 05:42
There is a joke in biological circles that a worm is any animal that's longer than it's wide and doesn't have a vertebrae, doesn't have a spinal column. So a snake: not a worm. But even in common language usage, if you go back far enough, even dragons were called worms, and in The Lord of the Rings, sometimes the dragon is referred to as a worm. So the term worm has a lot of different meanings. But in zoology, what I'm involved in, there are many different animals that are long and slender, and some of them are earthworms, and some of them are not earthworms. So earthworms belong to a larger group called the segmented worms, which means that their bodies are made out of little units called segments, strung together, kind of like beads, only there's no boundary, really. You can just see that sort of like the name for them in science is annelids, which means ringed. Because their body look like little rings around it, where the segment boundaries occur. Other worms, such as roundworms or flat worms, don't have those segments and don't have the same internal body structure as earthworms do. The other big group of segmented worms is in the ocean. They live in the sea. They swim around. They may live in holes in the sea bottom. They may hide in between rocks and corals and stuff. And, they are segmented, and those are called the polychaetes. Now, if you go to, like an aquarium display, you may see these things, and they're sometimes called feather duster worms,

because they have these sort of plume-like appendages on their heads. Some of them, the pretty ones do. The not pretty ones just sort of burrow around in the mud, and they look like a weird version of an earthworm. But those are polychaetes, and they have a very different structure in the details from earthworms. So, earthworms are a set of segmented worms that live almost always on land, and they burrow in the soil and they eat decaying plant material. So that's in a nutshell, what earthworms are.

Jane 08:20
How many different species of earthworms are known?

Sam James 08:23
Somewhere over 5000. Now, the number changes every month, because new publications, new species are being described by the not very many people who study earthworms. So if you want a career in finding new species, and you don't want a lot of competition, earthworm is the place to look.

Sam James 08:50
How many species of earthworms have you personally seen?

Sam James 08:55
Many hundreds, and I've described and given names to a few hundred. I haven't really counted in a while.

Jane 09:04
Well, we have kids around the world who have a lot of questions about worms because they are really interesting, and they're an animal that is both commonplace and mysterious. You see them, but often you only see them at certain times, like when it's raining and they come out from underground, or they're in a puddle and you've seen one that has died, or you're digging in the garden and you see one. So we have kids who are really curious about worms, and several of them want to know...

Solstice 09:34
Do worms have eyes? Hi, my name is Solstice. I'm four years old. I'm from West Virginia.

Betty 09:43
Hi. My name is Betty. I'm three years old. My question is: why do worms have no eyes?

Riley 09:52
Hello, my name is Riley, and I'm five years old, and I live in Springfield, Missouri. How do worms see without eyes?

Jane 10:01
How do worms see and do they have eyes?

Sam James 10:04
Well, they don't have eyes. They can detect light, but basically it's light versus dark. Or maybe different light intensities. Sometimes they'll avoid light. You know, you can turn on a light in a dark room with an

earthworm on a table, and it will react to the light. So we know that they can do that, but they don't have any way of picking up an image of what's in front of them. And that makes sense. 99% of their lives are spent underground. So they don't really need eyes. They use their sense of smell, taste (which is just probably one thing for them). They can feel vibrations of the soil. So, they in effect, they can hear, but they don't really have ears. They can just detect the vibrations. So that's the story on earthworms and eyes: no, but they do have other sensory abilities.

Calvin 11:05
My name is Calvin, and I am from Cranston, Rhode Island. I'm six and a half years old, and my question is: how do worms communicate?

Jane 11:21
How do worms communicate?

Sam James 11:24
Hmm. Probably by feel and touch and taste. They can't make sounds, except what little noise they might generate moving in their burrows. But when two worms touch, then they can probably determine, "Oh, are you the same kind of worm as I am?" Yes or no. I imagine they can do that. And they would need to have that ability, because they would want to know, particularly if it's mating season, is this another worm of my same species and is this other worm a potential mate? And other than that, I don't know what kinds of interactions they might have. One exception that we know about is there's a kind of worm known as the red wigglers. And these are used in composting, so breaking down garbage, organic garbage, waste, lawn clippings, whatever, to make a good compost for the garden, to fertilize the garden. These worms do sometimes form into little clumps and move together. So they must have communicated, probably by some chemical they secrete. "The place we're in is terrible, let's leave". So this happens when people are raising these worms in bins for their composting, and maybe they're not doing it quite right, and so they will leave. I've had this happen, and I find a ball of worms on the floor in my basement. I said, why a ball of worms? Well, because a single worm is in danger of drying out. But if they're in a group, they can stay damp, stay moist together. So they'll move as a kind of clump and hope that they find a better place to live. Then there's a worm in Africa that eats other earthworms. It's a very strange worm. It's it doesn't have--no worms have teeth. But this is a predator, and it can detect that a burrow has a different species of earthworm in it, which could be food, or it has its own same species of earthworm in it, which it might want to avoid, because, you know, they might eat first and ask questions later, so they can detect by chemicals who's who in the burrows.

Eleanor 14:08
My name is Eleanor. I am four years old. I live in Great Britain, England, Lincoln, England. And my question is, why do worms wiggle?

Sam James 14:25
They wiggle because that's how they move. You look at them: there's no legs, no hands. If they want to go from one place to another, they have to do something. So they'll kind of scoot along. The head will extend out, and then it will grab onto the ground with their little hairs, and then it'll pull its tail behind it, and then repeat, push the head forward. grab on, pull up the tail. Or they may wiggle, you know, more,

sideways. And sometimes they're wiggling because they're trying to get away, get away from Eleanor or others, and sometimes they're wiggling, because that's just how they get around.

Gavin 15:05
My name is Gavin. I live in Fairfax, Virginia. I am eight years old, and what I want to know is why do worms have slime?

Jane 15:13
Gavin wonders why do worms have slime? Is that related to how they move, too?

Sam James 15:18
It helps sort of smooth the way. The slime acts like grease, you know, so that they're passing through soil. Soil is kind of rough. You know, we may not think it is, but when you have a very thin skin and you're rubbing against it all the time, a little slime helps. The slime also, because, you know, you're finding that earthworm out in the air where it's dry, the slime helps protect it from drying out. So it'll ooze out some of the slime to help it stay, to keep its skin from getting dry. So that's another reason for the slime.

Jane 15:58
You mentioned they have to move through the dirt, and dirt can be dry. And a lot of kids want to know, why do they live underground? Why do they like the dirt and live in the dirt?

Libby 16:09
My name is Libby and I am four years old. I am from North Carolina, why do worms like the dirt?

Annabelle 16:19
My name is Annabelle and I'm seven years old, and I live in Utah, and my question is: why do worms live underground?

Sam James 16:33
Well, we can ask the same question about any animal: why does it live where it lives? And earthworms are animals that originally, we think, came from wet places, you know, edges of lakes and rivers, or before that, even, from the ocean. And the first earthworms found this habitat that was open, it was available. There was nothing like an earthworm living in the soil way, way, way long ago, before dinosaurs, even. And it was a place that they could live. And so they moved. Some of them were able to live there. And then they got better at it and better at it over the years, and became very good at living in soil. It would be very difficult for an earthworm to live anywhere else, because it needs the dampness of the soil. It needs the food that's found in the soil. And they just won't make it any other location. It's also performing a very valuable function by increasing the channels for air and water to enter the soil. And it helps recycle the dead plant material that makes fertilizer for future plant growth.

Jane 17:55
So if we didn't have earthworms and other creatures that break down organic material, and can eat that soil and make it not super hard and compacted, our earth would look really different.

Sam James 18:08
Yeah, the build up, you know, if you live in a place where the trees drop their leaves every year, you can imagine year after year after year, those leaves would just be piling up. They will decay, just from bacteria and fungi, but the little animals make that happen a lot faster. So it means that the soil nutrients are being made available faster. Roughly 90% of what plants grow doesn't get eaten by an animal directly when it's alive. It falls to the ground, and it must be broken down by all of these little animals like pill bugs and earthworms, and millipedes, and thousands and thousands of other little types of animals that work on this, with the help of bacteria and fungi. So that's this whole world that sort of is below our feet. We don't think about it very much because we can't see it, but it's there, and it's really important.

Jane 19:17
Well, Nico asks ...

Nico 19:19
Do worms poop?

Jane 19:21
And is that how we're getting all of that organic material? A lot of it is worm poop?

Sam James 19:26
Yeah, you can think of soil where there are earthworms as...soil is just something that temporarily isn't inside an earthworm. It will be again; it has been many times. And soil, you know, it doesn't just sit there. It's hard for us to imagine or to see, because we can't really see this happening. But soil is constantly changing. It's being eaten by worms. It's being eaten by other little animals. It's being pooped back out by those little animals. So it's this sort of constant stirring, but it's really slow. It could take five to 20 years, really, for the soil to just sort of be completely eaten by the animals that live there. And it doesn't go away, it just comes out the other end, and it's soil again. But really, all that soil out there is worm poop. Some of it's 20 years old worm poop. Some of it's a day old worm poop. Some of it's, you know, two years old worm poop. But it's all at one time or another. It has passed through a worm and it will again.

Jane 20:42
That's an amazing fact! So the next time you see someone playing in the dirt or digging in the garden, you can tell them that all that soil they're getting their hands in has been inside of a worm and will be inside of a worm again! Coming up: why do worms sometimes come out when it rains? Plus, we'll meet one kid who's been keeping hundreds of worms as pets! Well, not pets exactly. More like farm animals. She does worm composting for her family's leftover food scraps. And she's even started a business selling what she calls "worm tea." Stay tuned to find out more.

BREAK 21:18
BREAK

Jane 21:19
This is But Why! I'm Jane Lindholm, and today we're talking with a scientist named Sam James. He's an expert in earthworms. And he's actually officially named and documented a few hundred species of them. One thing many of you have observed about the earthworms that live near you is that although they spend 99.9% of their life underground, burrowing in the soil, you sometimes see them up above ground, especially on rainy days.

Nicholas 21:47
Hi, my name is Nicholas. I'm five years old. I live in Washington, DC, and my question is: why do earthworms come out in the rain?

Gavin 21:59
Hi, my name is Gavin. I'm five year old, and I live in [unclear]. My question is, why do worms come out when it rains?

Parker 22:10
Hello, my name is Parker. I'm seven years old. I live in Northfield, Vermont, and my question is: why do worms only come up when it's raining?

Sam James 22:21
Well, even though they're used to living in holes where you think there's not a lot of air, and there isn't, once it's been raining a lot, there is no air. Oxygen comes into the soil through tiny little holes and cracks and through earthworm burrows. If those tiny little holes and cracks all fill with water, then the air can't come down in. And all of the life in the soil needs oxygen, just as we do. But we're living in a great--huge amounts of oxygen all around us. But down there, everything is using oxygen and nothing is making oxygen. So they come out because they can't breathe. They absorb oxygen through their skins. But when the water is filling all the air spaces in the soil, then there's not enough oxygen for the worms, so they come out. And then they go back.

Zuli 23:20
My name is Zuli. I'm four and a half years old. I live in Madison, Wisconsin. My question is, why don't worms get squished under the dirt?

Jane 23:29
Zuli wonders, why don't worms get squished under the dirt?

Sam James 23:33
Well, the dirt isn't falling. Now, if you stomp on the dirt, you might squish a worm that's in the dirt where you stomped. But normally the soil has some strength. It holds itself up. And earthworms and plant roots and animals of various kinds that live in the soil are always kind of fluffing it up. So there's a little air space in the soil. This may seem strange, but soil is about at least a third airspace.

Lorenzo 24:04

My name is Lorenzo, and I'm five years old, and my question is: why do worms have to, when somebody chops them in half, they turn into two?

Jane 24:18
Why do worms become two worms if you cut them in half?

Sam James 24:24
That depends on the worm. So there are kinds of worms, the flat worms, if you cut them in half, you will get two worms. The head end will grow a new tail. The tail end will grow a new head. But earthworms can't do that. If you cut them in half, directly, halfway, typically, the worm will grow a new tail, but the other half, the back half, is going to die. Cause the head is where all the organizing intelligence is, and that's where the little earthworm brain and other body parts can say, "Oops, we got cut." So first, they heal the cut, and then they start growing new tail segments. So it just isn't true for earthworms.

Jane 25:15
It's never kind to intentionally harm an animal just to see what might happen, or because you think you might get two. Sam believes earthworms feel something like pain, so we don't want to be the cause of that pain. Sam says one thing he finds endlessly fascinating about earthworms is how many different kinds there are and how many different ways of living they have.

Sam James 25:39
You can find earthworms that live in the sand of some tropical ocean beaches. You can find earthworms that live high up in trees in the rainforests. You can find earthworms that live on a rotting log and nowhere else. You can find earthworms that are just like ordinary earthworms. And then you can find earthworms that are, oh, really, really long, like a meter, two meters (or three feet to six feet long), as big around as a garden hose. You know, there's a huge range of sizes, and all of these correspond to different ways of living in different soil conditions, or even out of the soil up in a tree.

Jane 26:31
Thanks to Sam James for helping us learn so much fascinating information about earthworms. Before we go, I want to introduce you to someone else who's learning a lot about earthworms. Emilee Gordon lives in the town that I live in, Monkton Vermont, and for the last year, she's been doing something called worm composting, or vermiculture. That's when you keep worms in your house (or your garage or your barn or whatever), and use them to help you compost your food scraps. Remember how Sam said worms are really important because they break down organic matter like dead leaves or flowers, fruits and vegetables that fall to the ground? Well, they'll do the same thing with the food scraps you don't finish eating in your house. And Emilee's in charge of the worm composting operation at her house. But not only that, she's actually started her own business, making what she calls worm tea. Let's pay a visit to Emilee's kitchen to learn more.

Emilee Gordon 27:27
So a worm farm is a container, like pretty small or not like a small box, but like a bigger box, and it can't be made out of cardboard or, well, they'll eat it.

Jane 27:42
The worms will eat it?

Emilee Gordon 27:43
Yeah.

Jane 27:44
Okay, so you have these two boxes, and these look like they're made out of plastic, and they're kind of up on a little stand. I mean, you could almost think these look like just storage bins, or even like a little, like a little shelf or something, or a stand that you would sit on to put your shoes on. They're pretty small.

Emilee Gordon 28:02
And this is the food area.

Jane 28:05
Okay, so you have what looks like maybe a burlap sack on top.

Emilee Gordon 28:09
Yes, a coffee bag.

Jane 28:10
What's the coffee bag for?

Emilee Gordon 28:12
To...I actually don't really remember, but my best guess is to keep the moisture in it.

Jane 28:19
Then what's under the coffee bag?

Emilee Gordon 28:21
So we have paper, like shredded paper from the shredder. And we've got food.

Jane 28:31
Right, because this is compost, right? So you're taking food scraps, usually vegetables and fruits and other organic materials, and you're putting it in for the worms to eat.

Emilee Gordon 28:40
Yep, and this is a carrot, but it is small, and I have to finish feeding them, because I think--I know they need more food. And and more paper. Ooh, banana peel.

Jane 28:55

Emily's mom is helping here, handing us a banana peel. So you're going to put the banana peel in to feed the worms, because the worms are eating all of the leftover things from your food that you're not eating.

Emilee Gordon 29:06
Yes.

Jane 29:06
So you're adding food scraps and shredded paper.

Emilee Gordon 29:10
And what you want to do with these food scraps is you want to make a layer of shredded paper, put the food scraps down and then bury them.

Jane 29:21
Why do you do it that way?

Emilee Gordon 29:23
So the worms don't have to come up to the surface and see the sun or something, because they actually won't eat it that way.

Jane 29:33
Emilee's putting a lot of shredded paper into the bin, and it's covering the banana peel, and then the burlap sack, the coffee bag, is gonna go back on top. And then the top of the worm composter is gonna go back on top, because you said the worms don't like sun.

Emilee Gordon 29:50
Not yet.

Jane 29:52
What do we do next?

Emilee Gordon 29:54
Water. So I do five seconds of hot water. And then five seconds of cold water. Let me just let it get cold. Then I turn both on until it's full, and Mommy says to give each of them a full watering can. So now I am carefully going over.

Jane 30:23
All right, so you're putting the whole watering can, you're dumping it over the entire box of scraps.

Emilee Gordon 30:30
Yes, they like it to be warm and moist under the ground. That's how it usually is.

Jane 30:37

Right, because they're used to living in the dirt.

Emilee Gordon 30:40
Yeah.

Jane 30:42
So now you're covering it back over?

Emilee Gordon 30:43
Yes.

Jane 30:44
And now, how long will it take the worms to eat those scraps you just gave them, the watermelon rind and the banana peel?

Emilee Gordon 30:50
Well, first they'll start by actually getting up through the paper. So that'll take, like, a few hours, actually, but then I'd say about a day, but not finishing it, just getting to it.

Jane 31:06
How many worms do you have in one worm farm?

Emilee Gordon 31:09
Good question. Over 1000 in each.

Jane 31:14
So if we go open them up, can you name them all for me?

Emilee Gordon 31:18
No, I cannot.

Jane 31:22
Do you name any of them?

Emilee Gordon 31:25
No, because I can't tell them apart.

Jane 31:27
What kind of worms do you have?

Emilee Gordon 31:29
Canadian nightcrawlers. And they're really good for fishing and making soil. Very good soil.

Jane 31:37

And we talked about this a little bit. But how do the worms make soil and make things that are good for your soil?

Emilee Gordon 31:44
They poop and pee.

Jane 31:46
Why do we want worm poop?

Emilee Gordon 31:48
It's rich for your garden. It's basically just dirt with a lot of air.

Jane 31:54
Emilee's right: this light and fluffy dirt is really good for your garden! But Emilee does more than use the worm poop-I mean, soil--in her family's garden. She also uses the liquid that sits at the bottom of her worm farm as a rich fertilizer, another way to make sure the plants on her windowsill and in the garden have great nutrients to feed off of. That's not worm pee, though. It's all the liquid that has soaked through the compost bin, picking up good nutrients and microorganisms along the way. To show me how she makes her tea, Emilee grabbed a big mason jar and opened a tap at the bottom of one of her worm farms. Brown liquid started flowing out, and Emilee peered into it to see if it was dark enough to use.

Emilee Gordon 32:42
Just gonna shut that off now, because I don't want it to overfill. It is so dark.

Jane 32:48
Kind of looks like iced coffee.

Emilee Gordon 32:50
Oh yeah, it does.

Jane 32:51
But maybe we shouldn't drink it.

Emilee Gordon 32:53
Yeah, definitely not.

Jane 32:56
Okay, so what are you gonna do once you have that worm juice?

Emilee Gordon 32:59
You put this in a big container, and then you put the same amount of water, and so 50/50, worm juice and water, so it doesn't kill your plant. Because just the worm juice will burn your plant's roots out of the ground.

Jane 33:17
But the worm juice with some water is good for your plants?

Emilee Gordon 33:21
Yes.

Jane 33:22
All right, so then, what do you do with the worm juice that you have? I hear this is kind of a business for you.

Emilee Gordon 33:28
Well, I do pour them into like, smaller mason jars and put a piece of paper that has my information on it, and then I give it to people for samples. But soon I'm gonna charge $5 per cup.

Jane 33:43
What are you gonna call it? Do you have a name for it?

Emilee Gordon 33:45
Yes, Emilee's Worm Tea.

Jane 33:48
Do you like keeping worms?

Emilee Gordon 33:50
Yes, they're like my little children.

Jane 33:53
Why? What's fun about them? You don't even get to see them most of the time.

Emilee Gordon 33:57
They're wiggly and they're squiggly.

Jane 34:00
If there are kids and their adults who are listening, who are like, "Eww, worms in your house?" what can you say about what it's like to actually have like, 2000 worms in your house?

Emilee Gordon 34:11
Well, they don't think they actually smell like rich, beautiful soil. Rich, beautiful soil.

Jane 34:20
Yeah. And I mean, it's not like you got worms crawling all around your kitchen.

Solstice 34:24

Yet.

Jane 34:27
That's what you're hoping?

Emilee Gordon 34:28
No, not at all.

Jane 34:30
Is there anything else that you want to tell us about worms that you think other kids would like to know?

Emilee Gordon 34:38
Well, I know how you can tell which part is where the mouth would be. So, and they don't have eyes because, well, they don't need it. Why would they need eyes? And they have little safety hairs on their bodies to grip the ground as hard as they can when they're in the wild when robins are trying to eat them.

Jane 35:02
That's cool. I didn't know about the safety hairs. You said you could tell which which end has the mouth. How do you tell?

Emilee Gordon 35:10
So on most worms, they have like this outcropping of flesh and stuff that looks like a bandage on part of it, and there's a short part on one side and a long part on the other side. So the short side is the head side. So it's like the neck part. And also, they can be in a lot of colors, not pink or purple, though. Well, they can be a little pink. They can be a little pink, like almost purple, like a more blackish brownish color and brown, and they can be black. They can be a lot of colors.

Jane 35:52
What colors are yours?

Emilee Gordon 35:53
Like the purpley-ish color, but more brown than purple.

Jane 35:58
Emilee, thank you so much for showing us your worm farm and your worm tea. It's really cool to learn about it.

Emilee Gordon 36:04
Thank you.

Jane 36:05
Thanks to Emilee Gordon and Sam James for getting us really hyped about earthworms. I hope you learned something new today. I sure did. That's it for this show. Now, if you have a question about

anything, you can send it to us. We do a lot of animal and science shows, but we're up for whatever you are curious about: music, art, philosophy, history. You tell us what you want us to investigate. Have an adult help you record yourself asking your question, plus your name, how old you are and where you live. And then your adult can send that file to questions@butwhykids.org.

Jane 36:41
Our show is produced by Melody Bodette, Kianna Kniffin, and me, Jane Lindholm at Vermont public and distributed by PRX. If you are a sharp-eared listener and you were surprised just there because I said Kianna Kniffin, instead of Kianna Haskin, she changed her name. Sometimes people do that, and sometimes they don't, when they get married, and Kianna got married a few days ago. If you want to learn more about how we get our names, we've got an episode all about that. We did it a few years ago. So go to butwhykids.org to search for it on our website. But back to the familiar names. Joey Palumbo works on our YouTube and video series, and Luke Reynolds wrote our theme music. We'll be back in two weeks with an all new episode. Until then, stay curious!