

Brains On (APM) | Brains On! The buzz on bees, pt. 2 01EJ9A5WN28B6S6FKETN3JFYE8

CHILD 1: You're listening to *BrainsOn*, where we're serious about bee-ing curious.

CHILD 2: *Brains On* is supported in part by a grant from the National Science Foundation.

[SCRIBBLING]

MENAKA: OK, Sanden. Here's another one.

SANDEN: Lay it on me, Menaka.

MENAKA: What do you call a bee with a dictionary?

SANDEN: I don't know. What do you call a bee with a dictionary?

MENAKA: A spelling bee.

SANDEN: Ha. Nice. Nice. I like it. OK. How about this one? How do bees style their hair?

MENAKA: I don't know. How?

SANDEN: With a honeycomb.

MENAKA: Oh. I like it. Maybe you should add a follow about a bee's favorite haircut-- the buzz cut.

SANDEN: Oh. Good one. I thought it would be the beehive. Either way, that's definitely going in the set.

MOLLY BLOOM: Hey, you two. Still working on getting that hilarious hive badge for your bee squad troop?

SANDEN: Yep. We've got to come up with a tight five of killer bee jokes.

MENAKA: If we can make our entire squad laugh, we get the badge.

SANDEN: And if anyone laughs so hard they squirt nectar punch out of their nose, we get a bonus badge.

MOLLY BLOOM: Wow. Well, good luck. Oh, and did you hear about the bee who couldn't make up her mind?

MENAKA: What? No.

MOLLY BLOOM: Yeah. She was a total may-bee.

[CYMBAL CRASH]

[THEME MUSIC]

You're listening to *Brains On* from American Public Media. I'm Molly Bloom, and this is part 2 of our bee bonanza. Joining me once more, we've got sibling duo Harlan and [? Piercey ?] Joy, also known as PJ. Welcome back, you two.

HARLAN: Hi.

PJ: Hi.

MOLLY BLOOM: So after our last taping, did you tell the bees about the taping?

HARLAN: I did.

MOLLY BLOOM: What did you tell them?

HARLAN: You're going to be famous.

[LAUGHTER]

MOLLY BLOOM: That's awesome.

PJ: Harlan, do you mean they're going to bee famous?

HARLAN: Yes. They're going to bee famous.

MOLLY BLOOM: Nice work. So what are the bees in your hives doing this time of year?

HARLAN: They're collecting water to keep the hive cool.

MOLLY BLOOM: That is so cool. I did not know bees did that. Today, we're focused on one of the most important things a bee does.

PJ: Serving the queen?

HARLAN: Making stingers look stylish?

PJ: Doing that buzz-buzz sound? I find it very soothing.

MOLLY BLOOM: Nope. Good guesses. Today, we're talking about pollination.

SANDEN: Did somebody say "pollination"?

MOLLY BLOOM: I did.

MENAKA: I heard "pollination," too.

MOLLY BLOOM: That was me. I said it.

SANDEN: Menaka and I are so excited because we are only two badges away from moving up to--

BOTH: The Pollinator Posse.

VOICE: Yee-haw.

PJ: Wow. You guys have been on a roll since the last episode.

MENAKA: We are indeed the most devoted of bee squad cadets. Oh, wait. Hold on. We have to do the pledge.

[DRUMS PLAYING]

A bee squad cadet is friendly, not sour.

SANDEN: A bee cadet knows small things have great power.

MENAKA: A bee cadet makes the most of each hour--

SANDEN: And takes care of the Earth--

BOTH: Especially flowers.

MENAKA: And, Molly, if you don't mind, if we can share some pollination facts with you, we can earn our pollination pontification badges.

MOLLY BLOOM: Oh, definitely. We are very invested in your bee squad cadet journey. Only two more badges to get to the next level. You can do it.

MENAKA: Thanks for being a friend to the bees. OK, here we go. Let the pollination pontification begin.

SANDEN: If you like fruits, vegetables, flowers, grains--

MENAKA: Clean air, healthy soil, and beauty in general--

SANDEN: Then you are a supporter of pollination.

MENAKA: Pollination is what flowering plants need in order to make more flowering plants.

SANDEN: If these plants don't pollinate, they can't grow and spread.

MENAKA: But when plants do grow and spread, they clear our air. They improve the soil. They give us fruits and vegetables and nuts and grains-- basically, all kinds of great things.

SANDEN: To pollinate, these plants need to pass their pollen to another flower from the same species in order to make more seeds and, hence, more plants.

MENAKA: Not only is pollen delicious to bees. It's got microscopic material full of a plant's genetic information, sort of like a very small package of instructions on how to make more plants.

SANDEN: Unfortunately, there's no pollen postal service to deliver this important genetic package from one flower to another. So plants rely on animal pollinators to do it for them.

MENAKA: An animal will come to the flower looking to drink nectar--

SANDEN: --which is the sweet liquid that flowers make, sort of like nature's free energy drink.

MENAKA: And while the animal is sipping nectar, pollen will stick to it, maybe on its legs or on its face. And then it will carry that pollen to the next flower that it visits.

SANDEN: Thirst quenched and pollen package delivered.

MENAKA: There are lots of kinds of pollinators. There's bats, birds, butterflies, dragonflies, rodents, lizards. Even the wind carries pollen sometimes. But as bee squad cadets, bees are number one in our hearts.

SANDEN: We may be biased, but bees are exceptionally great at delivering pollen. And there are some crops, like cherries and almonds, that rely almost exclusively on bees for pollination.

MENAKA: In conclusion, these bee-pollinated almonds are delicious.

SANDEN: Thank you for listening.

[TRUMPETS PLAYING]

OK. Let me just click here. OK. OK. Just uploading our speech to the bee squad council to see if we get badge approval. All right.

HARLAN: So what should we do while we wait?

PJ: Did you know that different bees have different talents that help them with pollination?

MOLLY BLOOM: Oh, yeah. That is so cool. And to find out more about that, we can check out the auditions for Insect Icon. It's the biggest talent competition in the bug world.

WANDA: Name and talent. I'm Wanda, I'm a honey bee, and I will be dancing.

HOST: Great. You're performer number 462. You can wait over there.

ZZ: Hi. Excuse me. I'm a bee, too. Did I hear you're a dancer?

WANDA: You did. What's your talent?

ZZ: I'm going to be singing-- well, buzzing. I'm ZZ. I'm a bumblebee. I don't dance, but I've always been so jealous of bees who do. How did you learn?

WANDA: It just came naturally for me. If I find good nectar, I dance to show my sisters where it is and how good it is, like this.

[FEET TAPPING]

ZZ: Whoa. That is so cool.

WANDA: That's just my circle dance. When there's good nectar nearby, I pretty much just dance in a circle. My sisters get the picture. Here's my best dance.

ZZ: Wait. Aren't you worried other insects will see and steal your act?

WANDA: As if they could dance like this. This one's called the waggle dance, and it is pretty complicated. I don't see any other honeybees around. We're the only ones who dance this way.

ZZ: OK, as long as you're sure.

WANDA: Check this out.

[FEET TAPPING]

This is my waggle dance. I waggle and run in the direction of nectar. And how far run shows how far away the flowers are.

ZZ: Honestly, the complexity, the emotion, it's so moving. The judges are going to love your audition.

WANDA: Aw. Thank you.

ZZ: Your sisters are so lucky to get to watch you.

WANDA: They can't actually see when I dance. It's completely dark inside our hive. They feel my moves by putting their antenna on me. But enough about me. What about your buzzing? Are you just going to fly around for the judges?

ZZ: I do naturally buzz when I fly. My flight muscles make a low buzz like this.

[BUZZ]

But I have other buzzes, too.

WANDA: Oh, like the warmup buzz? I've heard some bees too a special buzz where they move their wing muscles but not their wings to warm up.

ZZ: You know, I'll be so hot under the stage lights, a warmup buzz plus those lights might fry me to a crisp. But, yeah, that is a buzz some bees do. Here's the buzz I'm most excited to perform.

[BUZZING]

WANDA: Wow.

ZZ: Can you hear the difference? I want the judges to know I have range.

WANDA: Definitely. What's that buzz for?

ZZ: OK. So this one is super special. It's way more powerful than my regular flying buzz. I use it when I'm out collecting pollen from flowers.

So I land on a flower, and then I grab onto its pollen parts and buzz like this.

[BUZZING]

My buzz actually jiggles pollen off of flowers. I use it on lots of plants like tomatoes and potatoes. This is pretty much the only way to unlock these plants' pollen.

WANDA: That is amazing. Wow. I wish I could buzz like that.

HOST: Performer number 462, you're up.

WANDA: Oh, that's me. Good luck.

ZZ: You too. Break a leg.

CHILDREN: Brains On!

MOLLY BLOOM: Now, Menaka and Sanden, we're doing something a little different today. Since you're all about increasing your bee knowledge, Harlan and [? Piercey ?] [? Joy ?] have brought in a mystery sound for you to guess.

[FUTURISTIC TONE]

CHILD 3: (WHISPERING) Mystery sound.

PJ: Here it is.

[SCRATCHING SOUND]

What is your guess?

MENAKA: Hmm, it sounds almost like sawing. I'm hearing sort of, like, a back-and-forth motion. Maybe you're sawing something to build something for the bee boxes.

SANDEN: That's a good one. I heard sawing, too, at first. And then I also thought maybe, like, blowing, like [PANTING], kind of like when I'm doing my Jazzercise aerobics, and I'm just like really winded. I'm like [PANTING]. So maybe there's some kind of wind blowing thing, like someone's starting to fire.

HARLAN: Those are some good guesses.

PJ: Yep.

HARLAN: We'll hear it again and give you another chance to guess a little later in the show.

[MUSIC PLAYING]

MOLLY BLOOM: Our book is now available everywhere, and we are so excited to share it with you. It's called *Brains On Presents It's Alive, from Neurons I Narwhals to the Fungus Among Us*. As part of our book launch, we had a couple virtual events last week, and they were so fun.

There's one more coming up on September 26. You can find the details about that at brainson.org/events. And if you do have a copy of our book, we'd love to see you reading it. You can send it to us or post to social media with the hashtag #brainsonbook.

We are working on a show about the science of siblings, and we want to hear from you.

PJ: What's the best thing about being the oldest?

HARLAN: Or middle?

MOLLY BLOOM: Or the youngest? Maybe you're an only child, or maybe you have a twin. Whatever your sibling situation, we want to hear why you think it's great.

PJ: Send your answers to us at our website--

MOLLY BLOOM: [Brainson.org/contact](https://brainson.org/contact). You can also send us questions, ideas, mystery sounds, or drawings, like maybe one of Menaka and Sanden earning their bee squad badges.

HARLAN: I'd like to see that.

PJ: And the website is where we got this question.

CONNOR: Hi. My name's [? Connor, ?] and I'm from Phoenix, Arizona. And my question is, how are alligators and crocodiles different?

MOLLY BLOOM: We'll be back with an answer to that during our Moment of Um at the end of the show. And we'll read the most recent list of names to be added to the brains honor roll.

PJ: So keep listening.

MOLLY BLOOM: You're listening to *Brains On*. I'm Molly.

PJ: I'm PJ.

HARLAN: And I'm Harlan.

MOLLY BLOOM: And we are going to go back to that mystery sound. OK, Menaka and Sanden, get those ears ready.

[SCRATCHING SOUND]

All right. Any new guesses?

SANDEN: I am going to specify a bit with my guess. So I still hear-- it does sound like a saw. But I also think it kind of reminds me of when you're in a fireplace and you have one of those-- is it called a bellow?-- where it's, like, two pieces of wood and there's like an accordion bag kind of thing in the middle, and you kind of pump it, and it blows out air to help get the fire started. That's kind of what it sounds like to me.

MENAKA: Yeah. That's what I was thinking. I liked your guess before, Sanden, of blowing air. And it either sounds like scrubbing, like scrubbing something, or, yeah, something that pumps air out over and over.

MOLLY BLOOM: Very good guesses, you two. Here with the answer is Harlan and [? Piercey ?] Joy's little sister, [? Liesl. ?]

LIESL: That was the sound of my smoker going up and down, up and down, up and down. I use the smoker when my mom and I visit the bee yard. The smoke covers the bees' alarm signal to keep them calm. We get the smoker going by giving it sticks, leaves, and twigs, and lighting it on fire. And then we pump the bellows, and smoke comes out.

MOLLY BLOOM: Nice work. That was a really good guess. You were right on.

SANDEN: We got it? That's awesome. I did hear the word "bellows."

MENAKA: Wow. That's so cool.

SANDEN: So smoke helps bees chill out?

PJ: We use the smoker especially when we're getting their honey, because they do not like that.

SANDEN: [LAUGHS] So this is just basically, like, calm down, everybody. We're going to come in and get some honey. Just chill out with these smoky air.

PJ: The reason they really don't like it is because they work really hard on it, and they also eat it. So it's kind of like if someone just came into your house and decided to take some fruit from your refrigerator without even asking, so.

MOLLY BLOOM: And so when they build-- they build their honeycombs on the frames, and you can take those frames out and gather the honey from them. Do you put the honeycomb back, or do you just put the frames back, and then they build new honeycombs?

PJ: If we can, we just cut off the wax tops. And so that-- because it's really hard for them to build the honeycomb. And so it's just better to leave the honeycomb in there so that they can just fill it up with honey and then put their caps on.

MOLLY BLOOM: Got it. And we should say that the bees do eat the honey over the winter, but they make more than they need. So you still leave some for them to eat over the winter, right?

PJ: Yes. We do.

MOLLY BLOOM: That's awesome. They have enough to share.

PJ: Yes. We only take it out when they have a lot.

MOLLY BLOOM: And what are your favorite things about honey? Do you have a favorite thing about honey, Harlan?

HARLAN: Yes. I like to put it on biscuits and toast.

SANDEN: I like honey and peanut butter on toast. That's, like, my jam, which, coincidentally, doesn't have jam. It's just peanut butter and honey.

PJ: I like that it doesn't spoil.

MOLLY BLOOM: Yes. Honey is so amazing. And that's because the properties of honey prevent the growth of bacteria and other stuff that would make the honey go bad. And because of these properties, ancient people would use honey to treat cuts and other wounds. So honey is not just for eating. It is awesome.

PJ: When I got a finger infection once-- and so I went to the hospital, and somebody put this thing called Medihoney on my finger. And it got better.

SANDEN: Oh, yeah. I'm looking at it right now-- Medihoney.

MOLLY BLOOM: So it's not just ancient people. I guess people are still using it to treat wounds today.

VOICES: Ba-ba-ba-ba-ba-ba-ba-ba-ba-ba, *Brains On*.

SANDEN: OK. Is the projector ready?

MENAKA: Yep.

MOLLY BLOOM: What's going on now?

SANDEN: How about the lasers and the smoke machine?

MENAKA: Pew-pew and puff-puff. Ready to rock.

HARLAN: Sanden and Menaka are about to give their final presentation to their bee squad counselor.

PJ: Yeah. And if they ace this, they'll finally join the Pollinator Posse.

[TRIUMPHANT TONE]

VOICE: Yee-haw.

MOLLY BLOOM: Oh, exciting.

SANDEN: And I see you've got your bee costume on, Menaka. And it looks amazing.

MENAKA: Thanks, dude.

SANDEN: I think we're ready.

MOLLY BLOOM: Perfect, because here comes Sheila Kolla, bee researcher and bee squad counselor extraordinaire.

[DRUMS PLAYING]

SHEILA KOLLA: Hi, everyone. This is truly a momentous occasion. Sanden and Menaka, you've both done great work as larval cadets and bumblebee besties. But now you are on the precipice of joining the highest level of bee squad there is. Are you ready?

MENAKA: So ready.

SANDEN: Yeah, can't wait to do this.

SHEILA KOLLA: OK. Start your presentation whenever.

SANDEN: All right. Hit the lights.

[SWITCH FLIPS]

MENAKA: Cue the lasers, smoke, and music.

SANDEN: Here we go. For our final presentation, and for possible entrance into the Pollinator Posse, we're going to talk about how we can all work together to save the wild bees.

MENAKA: Bees, bees, bees.

SANDEN: I'll be the narrator.

MENAKA: And I'll be playing the part of a bee.

SANDEN: Now, research has shown that over the last several decades, the number of wild bees in North America has shrunk dramatically. This happened for several reasons.

[MUSIC PLAYING]

MENAKA: Bzz. I'm a bee. I am minding my own business and being awesome. Bzz-bzz.

SANDEN: Wild bees like this one do a great service to the world by pollinating flowers.

MENAKA: Bzz. Pollinating is my jam. I'm going to go buzz over to my favorite flowers now. Bzzz.

SANDEN: But as we humans made more cities and towns and farms and roads, we built over and removed a lot of the wild plants bees need to survive.

[MUSIC PLAYING]

MENAKA: Bzz. Oh, no. My favorite flower patch is now a dentures business. Whatever will I eat?

SANDEN: In addition to loss of habitat, farmers use pesticides to get rid of pesky bugs that harm their crops. But those pesticides also hurt bees.

MENAKA: Whoa. This cloud of bug spray is making me dizzy. Bzz-bzz.

SANDEN: Humans also brought bees with them from other parts of the country, or even from across the seas. And those foreign bees sometimes carry diseases or parasites with them that infected the local bees.

MENAKA: [COUGHS] I feel bad. Bzz.

SANDEN: And finally, as man-made climate change heats up the planet, things are getting hotter and hotter. And it's harder for some bees to survive.

MENAKA: Oh, I'm so hot. Bzz. It's like my wings are melting. Bzz.

SANDEN: Without our bee friends, there's less pollination, and with less pollination, fewer healthy plants, and with less plants, less food for wild animals and even us humans. So what can you or I do to help our little winged friends? Well, we called up Peter Soroye for advice. He studies bees at the University of Ottawa. He said the first thing to do is set up native habitats.

PETER SOROYE: It's really easy to figure out what kind of wildflowers grow in the region you live in and then plant them. Plant them in your backyard. Plant them on a planter on your porch or your balcony. And this is really great for bees. It gives them a little oasis in kind of the desert of urban landscapes where they can stop in and forage for nectar or get some pollen and bring back to their hives.

MENAKA: Wow. Bzz-bzz-bzz. This backyard is full of native plants, my favorite snack.

SANDEN: Peter told us bees also need places to make nests in the spring and summer and spots they can sleep in over the winter. You can help here, too.

PETER SOROYE: So things like leaving leaf litter on the ground, this is a good thing for bees because they can start nesting there in the spring or overwinter there in the fall. Leaving things like fallen logs on the ground is good. That's also some great kind of overwintering habitat for them.

It's kind of-- I think the hopeful message for a lot of people can be the lazier you are with your garden, the more you kind of let these local wildflowers grow and leave leaves on the ground and logs on the ground, the more beneficial it can be for a lot of bees and insects.

MENAKA: Bzz. Whoa, I am exhausted, so busy these days. Oh, look. Wow. A pile of old leaves-- a perfect place for me to spend my winter days. See you next spring, world. Nighty-night. Bzz-bzz.

SANDEN: So by planting native flowers and creating mini-bee homes from fallen logs or piles of leaves, we can all be part of the solution and help bees bounce back.

MENAKA: Back, back, back.

SANDEN: That's our presentation.

MENAKA: Thank you.

[APPLAUSE]

SHEILA KOLLA: Well, I have to say that was great work. You really captured the essence of how to help wild bees. Menaka, Sanden, welcome to the Pollinator Posse.

[TRIUMPHANT TONE]

VOICE: Yee-haw.

SHEILA KOLLA: Here are your new badges.

MENAKA: Yes!

SANDEN: Yes, yes. We did it. We're in the posse.

MENAKA: Pollinator Posse.

SANDEN: All right.

MENAKA: Waggle, waggle, buzz, y'all. Woo.

HARLAN: Congrats.

PJ: High-five.

MOLLY BLOOM: You'll make an excellent addition to the Pollinator Posse.

[TRIUMPHANT TONE]

VOICE: Yee-haw.

MOLLY BLOOM: I always wanted to say that. It's so much fun.

[MUSIC PLAYING]

PJ: Bees help take pollen from one flower to another. And this helps plants make things like fruits and nuts.

HARLAN: Some bees do a dance to tell other bees where to find flowers.

PJ: And some bees buzz in a special way to get flowers to release their pollen.

HARLAN: Bee populations are declining due to things like loss of wild habitat and pesticides.

MOLLY BLOOM: But you can help bees by planting native plants and making bee refuges in your yard.

HARLAN: That's it for this episode of *Brains On*.

PJ: *Brains On* is produced by Molly Bloom, Marc Sanchez, Sanden Totten, and Menaka Wilhelm.

MOLLY BLOOM: Special thanks to David Pritchard, Megan Brown, Jeyca Maldonado-Medina, Nancy Shu, and Rosie Dupont. We had production help from Ruby Guthrie and Kristina Lopez and engineering help from Veronica Rodriguez.

HARLAN: And now, before we go, it's time for the Moment of--

BOTH: Um.

[VARIOUS VOICES SAYING "UM"]

CHILD: How are alligators and crocodiles different?

VENETIA BRIGGS-GONZALEZ: OK, hi there. I am Dr. Venetia Briggs-Gonzalez. I am a wildlife biologist with the University of Florida. And we are based in Fort Lauderdale because we are members of the Croc Docs Lab. We do a lot of work in the Everglades and in Southern Florida. So we're really close to where we do a lot of our work.

And the only place where crocodiles and alligators live in the same place is at the southern end of Florida where Everglades National Park meets the ocean. Alligators and crocodiles are very similar. They're in the same group of animals. They're both called crocodylians.

But alligators, they have a snout that is more rounded. So it looks more like a U. And crocodiles have a snout that is more V-shaped. So that's one way you can definitely tell them apart.

Alligators are also much darker in color. They tend to be dark, dark gray, black, almost, you would see. And a crocodile would be more like an olive green, almost like a dark yellow, depending on where they are.

Alligator teeth just chomp down. You can just see the top teeth from the top, whereas crocodiles, you will see both bottom teeth and top teeth showing. So it's like you can see all kinds of teeth. So that's why we say that a crocodile has a very toothy grin.

One of the big things with crocodiles and alligators is that people think that they're scary. And in fact, they're not that scary. They're really, really big, really cool animals. They are some of the oldest animals that have lived on this Earth. They're closer to dinosaurs than most other animals.

And they need our help because where they live is along the beaches. And that's where a lot of people like to go in fancy hotels and have really pretty beachfronts so they can go swimming. But a lot of these places are where crocodiles will nest, and they need places to put their babies.

And so we need to protect where they live so that we can have crocodiles and alligators in the future for our children and our grandbabies to be able to see what these amazing animals look like.

[VOICES SAYING "UM"]

MOLLY BLOOM: I have a pretty toothy grin as I read this list of names. It's the Brains Honor Roll. These are the amazing listeners who send us their questions, ideas, mystery sounds, drawings, and high fives--

[LISTING HONOR ROLL]

[MUSIC PLAYING]

We'll be back soon with more answers to your questions.

CHILDREN: Thanks for listening.