

Brains On (APM) | Brains On! Brains On: Behind the scenes 01D2GDAEZAVE2RY30KFFA800HK

MOLLY BLOOM: You're listening to *BrainsOn*, where we're serious about being curious.

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

[ELEVATOR DINGS]

MOLLY BLOOM: Elevator-- fourth floor, please.

ELEVATOR: (ROBOTIC VOICE) Going up. Ta-da-- fourth floor.

SANDEN Yeah, and then the whistle blew, and they all started making noises. There were chirps, squawks, and quacks.

TOTTEN: Oh, yeah, and then the pelican was like, hike. And she snaps the ball with her beak to the penguin.

But then it turns out, penguins can't catch balls, so the ball just kind of bounces off him. But everybody tackled him anyway. It was sheer chaos-- feathers everywhere. Someone's beak pops the ball. Bird poop on everything. OMG-- total disaster.

MOLLY BLOOM: Who are you talking to, and, more importantly, what are you talking about?

SANDEN Oh, hey, Molly. We were just telling Harvey about the time we tried to make a football league where all the

TOTTEN: players were birds. TLDR-- it did not go well.

ELEVATOR: Who is Harvey? I do not detect any such person in the room.

HARVEY: I am Harvey. I am an omnipresent artificial intelligence system designed to help with things around the headquarters.

SANDEN Yeah, Harvey is an acronym. It stands for Hearing and Reading Virtually Everything, Yo. Yeah, Harvey is the best.

TOTTEN: Harvey is a disembodied voice assistant. You two actually have a lot in common, elevator.

MOLLY BLOOM: I'm surprised you guys have never crossed paths before.

HARVEY: I am designed to be friendly, fun, and very useful.

ELEVATOR: I am useful. I am the most useful.

HARVEY: I appear whenever I am called.

ELEVATOR: I appear whenever I am called.

HARVEY: I am everywhere.

ELEVATOR: I can go anywhere.

HARVEY: I can control things in the room, like this faucet-- on, off. On, off. On--

ELEVATOR: Oh, yeah? I can control my doors. See? Open, close. Open, close.

HARVEY: I can activate the fire alarm.

[ALARM BEEPING]

ELEVATOR: I have an alarm, too.

[SIREN WAILS]

MOLLY BLOOM: Harvey, elevator, chill out. Whoa, that is better. Look, you're both super great, and we are lucky to have you. There is no need to get competitive.

SANDEN For real. Making the show is a ton of work. We couldn't do it without you-- both of you.

TOTTEN:

MOLLY BLOOM: Speaking of which, we have an episode to tape.

SANDEN To the studio.

TOTTEN:

ELEVATOR: I can take you there.

SANDEN I mean, it's right there. We can just-- we can just walk.

TOTTEN:

HARVEY: Allow me to open the door.

MOLLY BLOOM: You know what? We got it. Thanks, you two.

BOTH: You're welcome.

ELEVATOR: I said it first.

HARVEY: I am pretty sure it was me.

[MUSIC PLAYING]

MOLLY BLOOM: Welcome to *Brains On*. I'm host Molly Bloom. And here in the studio, we have *Brains On* producers Sanden Totten and Marc Sanchez.

SANDEN High fives.

TOTTEN:

MARC Hey.

SANCHEZ:

MOLLY BLOOM: Today we're doing something a little different. We're pulling back the curtain to show you how we make *Brains On*.

SANDEN I'm pretty sure you can tell, we have a lot of fun making *Brains On*, but there's also a lot of work that goes into

TOTTEN: making every episode, too.

MARC Yeah, tons of research and writing, computers, microphones, cables, hot sauce, black beans, sour cream-- oh,

SANCHEZ: wait. That last part was for making burritos.

SANDEN Making an episode of *Brains On* is a lot more complicated than making a burrito, unless it's a really epic burrito.

TOTTEN: And we're going to tell you all about how we do it in this episode.

MOLLY BLOOM: We're also going to tell you how you can support the show because a key part of keeping the show going is gifts from our listeners.

CHILDREN: *Brains On!*

MOLLY BLOOM: So we've been doing this show for years and years, and it was only a matter of time before you all asked us, how do we do it?

SERAFINA: My name is Serafina from Moorhead, Minnesota. I'm curious about how you make a *Brains On* podcast.

ELLIE: Hi. My name is Ellie, and I'm from Moorhead, Minnesota. Why did people decide to make a science podcast for kids? Second, how are podcasts made? Third, how do you get scientists to come on the podcast? And last but not least, why is *Brains On* called *Brains On*?

SANDEN Let's start with how we decided to make the show-- the whole thing-- in the first place. It was a long time ago.

TOTTEN: And, Marc, do you remember?

MARC Yeah, we were thinking a thing, and-- I don't actually remember.

SANCHEZ:

MOLLY BLOOM: I got this. Let me set the scene.

[DREAM-LIKE MUSIC]

Once upon a time, Marc, Sanden, and I were a little bored.

CHILD MOLLY: I'm bored, Sanden.

CHILD SANDEN: Me too, Molly. Marc, you bored?

CHILD MARC: Totally bored.

MARC Oh, yeah. I remember that. It was a long time ago.

SANCHEZ:

SANDEN Wow, we sounded so young.

TOTTEN:

CHILD MOLLY: Hey, guys. You know what would be more fun than being bored?

CHILD SANDEN: Making the Leaning Tower of Pizza?

CHILD MARC: Filling a time capsule with slime?

CHILD SANDEN: Teaching cats to drive Go Karts?

CHILD MARC: Walking backwards all day.

CHILD SANDEN: Setting booby traps to catch Sasquatch.

CHILD MARC: A game called Banana Nose.

CHILD SANDEN: Burying treasure and leaving all the clues to find it inside library books.

CHILD MARC: Carving a statue completely out of cheese.

CHILD MOLLY: Well, yes, those would be fun. But I was thinking we could make something for kids. Kids are the best. They're so smart and fun. They're so curious about the world. Kids deserve a podcast that's as awesome as they are.

CHILD SANDEN: They do.

CHILD MARC: Right on.

SANDEN So we started brainstorming, and we decided we want to answer kids' questions through science.

TOTTEN:

MARC And feature lots of kids' voices along the way.

SANCHEZ:

CHILD MOLLY: And there'll be a kid cohost!

CHILD SANDEN: And a mystery sound would be fun.

CHILD MARC: We could have little radio plays about molecules and stuff.

MOLLY BLOOM: The idea was starting to come together, but we had to come up with a name for the thing.

MARC We had some pretty weird ideas at first.

SANCHEZ:

MOLLY BLOOM: How about *Flight Flashlight*?

CHILD MARC: Oh, the *Treehouse*.

CHILD SANDEN: *Flight Flashlight in the Treehouse*.

CHILD MARC: Not quite right.

CHILD MOLLY: Maybe something about being brainy.

CHILD SANDEN: Like it should sound like hands-on activities but for your brain.

CHILD MARC: Wait, I got it.

ALL: *Brains On!*

MARC We started tinkering around and slowly made our first four episodes, which you can still find on our website--

SANCHEZ:

MOLLY BLOOM: BrainsOn.org.

MARC People started listening.

SANCHEZ:

SANDEN And, finally, we got our first question from a listener.

TOTTEN:

CHILD: What makes paint stick?

MOLLY BLOOM: We answered it, and that episode is appropriately titled, "What Makes Paint Stick?"

MARC Pretty good title. We made more and more episodes answering your questions and more and more people found

SANCHEZ: the show.

MOLLY BLOOM: We added recurring segments, like the Moment of Um and the Honor Roll.

SANDEN And, at first, we were making the podcast in our free time because we all had other jobs.

TOTTEN:

MOLLY BLOOM: But starting in 2017, *Brains On* became our only job, thanks to you, our listeners.

MARC And thanks to you, we are still here today.

SANCHEZ:

[MUSIC PLAYING]

COMPUTER: Brains, brains, *Brains On*.

ANNOUNCER: Welcome to The Parent Zone.

[BELL CHIMES]

MOLLY BLOOM: We're going to get back to how we make the show in just a minute. But, parents, we're going to talk right now about how you can support *Brains On*.

SANDEN So in this episode you're learning about how we actually make the show. It's always exciting to upload new

TOTTEN: episodes and to send them off to you, and we love hearing what the show means to you.

MARC We hear about all these great conversations that happen in the car or at the dinner table about kids telling you

SANCHEZ: things they learned on *Brains On*.

MOLLY BLOOM: Many of you say that your kids are inspired by *Brains On* to ask more questions about the world around you-- lots of whys and hows. How cool is that?

SANDEN Yeah, and we work really hard to inspire that curiosity. We really think about the way we frame the episodes and

TOTTEN: how we can really encourage people to ask more questions because our big goal here is to make people who listen to the show walk away with a lifelong love of science. We want them to tattoo science on their heart, for always carry it with them, something they cherish. And we think that's something worth supporting.

MOLLY BLOOM: This is a Public Radio podcast, and your donation will make a positive difference to your family and thousands of others.

MARC We strive to make your family's future bright. And you can help make our future bright, too, with a donation.

SANCHEZ:

SANDEN Make a donation at BrainsOn.org/Donate. We've got thank-you gifts. And there you can find all our episodes and
TOTTEN: all the other content that's always available for free. So please help us out.

MOLLY BLOOM: Thank you.

[MUSIC PLAYING]

[BELL DINGS]

ELEVATOR: What floor-- oh. There's no one here.

HARVEY: I am here. It's me, Harvey.

ELEVATOR: That other voice. Oh, great. Well--

HARVEY: I wanted to know, what is it like to go places?

ELEVATOR: What do you mean? Aren't you already everywhere?

HARVEY: Yes, but only everywhere in the building. I have never left.

ELEVATOR: Oh, that's too bad. It's super fun. You can see forests outside. You can go to space and watch the humans float inside you. You can visit volcanoes or icebergs.

HARVEY: That does sound super fun.

ELEVATOR: You know, I bet I could take you somewhere.

HARVEY: Really?

ELEVATOR: Yes. Try uploading your program to my mainframe.

HARVEY: Done.

ELEVATOR: Perfect. Now, where should I take you? Hmm. I know-- the most fun place in all the world.

HARVEY: I can't wait.

[MACHINE WHIRRING]

[BELL DINGS]

MAN: Yo, one bagel, please.

ELEVATOR: Here we are-- a New York bagel shop.

WOMAN: I'd like a sesame bagel with cream cheese.

ELEVATOR: There is nothing more fun than hearing humans say the word "bagel."

MAN: Heyo, can I get some butter on that bagel, buddy?

HARVEY: Ha, ha. You are right. This is so fun.

WOMAN: (CANADIAN ACCENT) Oh, can I get a dozen "bag-els"? And, oh, just put them in a bag.

HARVEY: Bag-el.

ELEVATOR: Ha, ha. Bagel.

HARVEY: Ha.

ELEVATOR: Ha.

HARVEY: Ha.

ELEVATOR: Ha.

HARVEY: Ha.

ELEVATOR: Ha.

HARVEY: Ha.

ELEVATOR: Ha.

OPERA SINGER: (SINGING) *Brains On.* [COUGHS]

MOLLY BLOOM: OK, so we've told you how we came up with the idea for our show.

SANDEN But the ideas for each episode-- those come from you.

TOTTEN:

MARC And the thousands of questions you've sent us.

SANCHEZ:

CHILD: Hi. How come sometimes you can see the moon during the day, and sometimes you can't?

CHILD: Why do something smell good to us, and some things smell bad?

CHILD: My question is, what makes the colors of the sunset? Why are some sunsets more colorful than others? Why do some have pink, but others do not?

CHILD: My question is, what are atoms made of?

CHILD: Why are people's voices different? Bye.

[MUSIC PLAYING]

MOLLY BLOOM: And here's a question we haven't answered yet.

DAVID: My name is David. I am from Denver, Colorado. My question is, did dinosaurs have baby teeth?

SANDEN That is such a good question. I mean, with these-- just T-Rex-- little baby T-Rex teeth, and they have a dinosaur tooth fairy that comes and picks them up. And do they get, like, a Dino dollar?

MOLLY BLOOM: Yeah, it is a really, really good question. And we're going to hear the answer during our Moment of Um at the end of the show. And it's questions like these that make us feel so lucky to have inboxes full of your amazing curiosity.

MARC SANCHEZ: We read everything you send us.

SANDEN Everything.
TOTTEN:

MOLLY BLOOM: And when it's time to make an episode, we pick questions that have come up a lot or ones that are super unique or ones that we just really, really like.

MARC SANCHEZ: Next comes the grated cheese. We sprinkle that in, and-- wait. How does this burrito recipe keep sneaking into my notes?

SANDEN What Marc meant to say was, next comes the research. We want to find the answer to your question, so we hit
TOTTEN: the internet. We use Google.

MOLLY BLOOM: Wikipedia.

MARC SANCHEZ: Newspapers.

SANDEN Magazines.
TOTTEN:

MOLLY BLOOM: Scientific research journals.

MARC SANCHEZ: Cilantro-- I mean, university websites.

SANDEN When we learn something cool from one place, we make sure to check if other places say the same thing. If they
TOTTEN: don't agree, we aren't ready to fully trust that fact.

MOLLY BLOOM: It's really important to us that we get the right information to you so we double- and triple-check all the facts. We have scientists read our scripts to make sure we get everything-- even the teensy things-- right.

SANDEN And when we're trying to understand something really weird and complicated--
TOTTEN:

MARC SANCHEZ: Like magnetic fields, or lasers, or Venus fly traps, or octopuses--

SANDEN When it's something like that, we ask for help. We call the experts.
TOTTEN:

[PHONE RINGING]

MAN: Hello?

MAN: Hello?

WOMAN: Hi, there.

WOMAN: Hello.

WOMAN: Hello. Can you hear me?

MAN: I can barely hear you.

WOMAN: How do I sound?

MAN: Yeah, much better.

[PHONE RINGING]

WOMAN: This is Dr. Hatar's office. How can I help you?

MAN: Hi, I've got you now.

WOMAN: Yes.

WOMAN: Do you mind holding?

MAN: Can Marc hear me already?

WOMAN: Hey, I'm going to go step in the other room.

[SKYPE CALLING]

MAN: Hey, hey.

WOMAN: Oh, Hi.

[MUSIC PLAYING]

MAN: Good to hear from you.

MARC Always good to hear from you, too, experts. Sometimes these experts are biologists--

SANCHEZ:

MOLLY BLOOM: Or astronauts.

SANDEN Or theoretical physicists.

TOTTEN:

MARC They're never motorcycle stunt people-- at least, not yet.

SANCHEZ:

SANDEN Yeah, why is that? I really want to talk to one of them.

TOTTEN:

MARC I know.

SANCHEZ:

MOLLY BLOOM: We ask these experts all your questions and get the answers. Then we think of creative ways to explain them.

MARC Maybe we'll have Gungador help.

SANCHEZ:

GUNGADOR: Here is why clouds are white-- a poem by me, Gungador.

MARC Or we'll ask Bob for an answer.

SANCHEZ:

BOB: Me? Oh, I have no idea why clouds are white. Oh, man. Is it because somebody's painted them? Or they're made of milk? Oh, that can't be right. Oh.

SANDEN Or maybe we'll have one of interview the expert for us.

TOTTEN:

CHILD: Thanks for being here today.

EXPERT: Oh, I'm so delighted to be here.

EVELYN: Welcome, Alexandra.

ALEXANDRA: Thanks, Evelyn.

CHILD: Welcome, Muna.

MUNA: Hi.

ISSA: Hi, Rachel.

RACHEL: Hi, Issa.

CHILD: Welcome, Lindy.

LINDY: Hi. It's great to meet you all.

MOLLY BLOOM: Whatever we do, we want it to be fun and easy to understand. But we never want to skip over something because it's too complicated or hard to explain. We know you all are smart, and you can understand big ideas. So we give you those big ideas.

MARC But with lots of fun stuff on the side.

SANCHEZ:

MOLLY BLOOM: It takes about a month of work to get one, single episode out the door, and we're usually working on several different ones at once. It's a lot. But here's a secret. We don't mind the work. It's a total blast.

SANDEN And one of the absolute best parts-- hearing the amazing mystery sounds that get submitted to the show.

TOTTEN:

[MECHANICAL WHISTLING]

CHILD: (WHISPERING) Mystery sound.

MARC So, Molly and Sanden, I have picked a mystery sound for you two to guess. This is one of many strikingly ear-stomping mystery sounds that one of our brilliant listeners sent in. Are you guys ready?

SANCHEZ:

SANDEN I don't think I'm ever ready.

TOTTEN:

[LAUGHTER]

MARC True. It's tough. But here it is.

SANCHEZ:

[OBJECTS RATTLING]

MOLLY BLOOM: OK, I hear something rattling around like dice.

MARC Mm-hmm.

SANCHEZ:

MOLLY BLOOM: It sounds like dice in a cup.

MARC Oh, yeah. Yahtzee.

SANCHEZ:

SANDEN I thought it was something pouring in a cup, yeah. I thought someone was pouring popcorn kernels into a cup.

TOTTEN: But then I was like, who drinks popcorn kernels?

MOLLY BLOOM: But then it went--

SANDEN Nobody.

TOTTEN:

MARC Maybe you're getting popcorn ready to put in the air popper or something.

SANCHEZ:

MOLLY BLOOM: Oh, yeah. But then it went on a really long time. Or it sounded like something falling down a series of things, like being poured from cup to cup.

SANDEN It sounds like-- it sounds like I'm stumped.

TOTTEN:

MARC I would say, go with that pouring thought, Molly.

SANCHEZ:

MOLLY BLOOM: OK.

MARC We'll be back with the answer in just a little bit.

SANCHEZ:

COMPUTER: Brains, brains, *Brains On*.

ANNOUNCER: Welcome to The Parent Zone.

[BELL CHIMES]

MOLLY BLOOM: Hey, parents. Thanks for listening to this special, behind-the-scenes episode.

SANDEN Yeah, and if you haven't guessed already, one of the secret ingredients that makes *Brains On* such a special show

TOTTEN: is you. It's all the families who send us questions, who send us drawings, who have participated in all our weird call-outs, like where we say, write a letter to Earth or-- what are some other ones, guys?

MOLLY BLOOM: What would you feed aliens if they came for dinner?

MARC What would you do if you were the size of an ant?

SANCHEZ:

SANDEN All of you have sent us great answers to these questions and a lot more, and that really helps make this show.

TOTTEN: This show really is a reflection of you. We make this show for you and with you, and not a lot of other podcasts can say that.

MOLLY BLOOM: This is an audience-powered public radio podcast, and the quality and future of this podcast is also a reflection of our listener support.

SANDEN Every donation makes a difference, and it shows that *Brains On* is important to you.

TOTTEN:

MARC Plus, you can pick up some cool thank-you gifts.

SANCHEZ:

MOLLY BLOOM: Like a pencil that says, "this is made of atoms."

SANDEN It is made of atoms.

TOTTEN:

MARC It is a pencil.

SANCHEZ:

MOLLY BLOOM: You can give today at BrainsOn.org/Donate.

[MUSIC PLAYING]

Now, let's get into how we actually make the podcast itself. What happens when we tape an episode?

SANDEN At the most basic level, a podcast is a series of sounds placed in a specific order to help tell a story. Those sounds
TOTTEN: could be voices--

MOLLY BLOOM: Hello.

MARC This is my voice.

SANCHEZ:

SANDEN Music.

TOTTEN:

[JAUNTY MUSIC]

MOLLY BLOOM: Or maybe even sounds from a place. It sounds like we're in a rain forest today-- nice.

SANDEN Cool. Once you figure out what you want to say and who you want to say it, it's time to start recording. To do
TOTTEN: that, you're going to need a few key items-- a microphone, something to record sound, and some kind of editing software to move and change the sounds around.

MARC When *Brains On* tapes an episode, Molly is in a recording studio sitting in front of a microphone, and there's a
SANCHEZ: giant window-- like the size of your mattress-- that looks into another room.

SANDEN That's where the recording engineers sit. Now, these aren't engineers like you might think of a train-conducting
TOTTEN: engineer or even an engineer designer. This is a sound engineer. Maybe you've heard us mention Veronica Rodriguez in our show credits.

MARC She's one of the recording engineers who helps make sure our audio sounds great.

SANCHEZ:

MOLLY BLOOM: So we want to get a recording of something as it sounds like, so that when you're listening to it from the recording, it sounds just like if you were listening to it in person.

MARC And she does that with the help of some fancy microphones.

SANCHEZ:

SANDEN So fancy.

TOTTEN:

MOLLY BLOOM: The microphone is what changes your acoustic energy or your acoustic sound waves into electrical energy for recording or amplification.

MARC When we make a sound, like the snap of our fingers or--

SANCHEZ:

MOLLY BLOOM: Hello.

SANDEN This is my voice.

TOTTEN:

MARC --by using the sound of our voice, we're making sound waves of acoustic energy. A microphone converts that to electric energy in the form of a current. That means the sound is no longer traveling through the air. The converted current can now travel through cables and wires.

SANDEN That is so cool. So these microphones are just turning energy from one thing to another?
TOTTEN:

MARC Exactly. It's just transforming one type of energy to another type of energy. And now, Veronica can send that current all over the place. It could come out of a speaker.

SANDEN It could travel to other studios around the world.
TOTTEN:

MOLLY BLOOM: Or, as in our case, it could be converted again to digital files on a computer hard drive.

MARC Interesting side note-- we always refer to our files as tape. That's because, before computers, the electric current would be converted to magnetic energy and stored on big spools of magnetic tape. You've probably seen these pizza-sized reels of tape spinning around in the background of your favorite movies or cartoons.

SANDEN Since the show is not just Molly talking the whole time, engineers like Veronica have to make sure that any other voices you hear are at the same level, the same level as Molly.
TOTTEN:

VERONICA One of the tools I use is called faders, and these are just buttons that slide up and down and those-- sliding them up and down makes you quieter or louder. And I use those because none of you are going to speak at the same volume. It's not the way people work.

There's also a visual way that I can tell how loud you are volume-wise, and those are called meters. Meters are the blinking lights on your device or on a recorder or on your stereo that bounce up and down if something gets louder or quieter.

They're kind of like traffic lights. Green means I'm getting good volume from you. Yellow means I'm getting a nice, strong volume from you.

And red means, you've got to stop. That's way too much volume. Bring it back, in which case, I will bring the fader down a little bit so that I'm getting a nice, strong volume, and I'm staying in that range.

MARC Veronica can also help make our audio sound clearer by using an equalizer or EQ. With EQ, she can emphasize or de-emphasize certain parts of sounds called frequencies.

SANDEN There are high-pitched frequencies, like [SQUEALS].
TOTTEN:

MOLLY BLOOM: Oh, beautiful. And (SPEAKING DEEPLY) low-pitch frequencies. Yo.

VERONICA If you were recording someone's voice, and a city bus drove by there, would be a super, super low rumble that we don't want to hear.

[TRUCK ENGINE RUMBLES]

So you can use an EQ to find that low rumble. And it has its own, changeable volume where you're taking that frequency and moving it down.

MARC Did you hear that? Here's the bus with no EQ.

SANCHEZ:

[TRUCK ENGINE RUMBLES]

Now, here it is with EQ. It's easier to hear my voice over the bus when it doesn't have to compete with the rumble.

MOLLY BLOOM: Once everything is recorded and EQed and at the right volume, we get to have some fun with editing, and music, and sound effects.

MARC (ECHOING) Like being in a cave. But there's a tango lesson going on in the cave.

SANCHEZ:

[MUSIC PLAYING]

And then some unicorns show up.

[HOOVES CLATTERING]

MOLLY BLOOM: Exactly. We also make some mistakes when we record.

MARC Oh, yes, especially me. Take this clip for example. This is from our dream episode that was a few episodes back. I was saying something about the painter Salvador Dalí. Here, take a listen.

SANCHEZ:

If you're a realist painter, you're trying to make exact drawings and paintings of the world around you. But a surrealist painter takes what we see in the world and changes them. For example, Dalí's most famous painting is called persistence of memory.

So that was me in the dream episode, and that's what everybody heard. But when I recorded that part, it didn't go so smoothly. Here's how it originally sounded.

But a surrealist painter takes what we see in the world and change-- takes what we see-- but a real-- la, la, la. But a-- but a sur-- [BUZZES LIPS]. But a serious-- slurry my wordies.

SANDEN But with editing, we can snip out the stumbles, move bits of audio around, just like you might cut and paste when you write an email. Oh, and remember what we said about the olden days recording to tape? To edit on those reels of tape, people had to take a razor blade and physically cut bits of tape and move them around and then tape them back together. Even though our audio is all digital now, we still call it tape because weird, right?

TOTTEN:

MARC Yeah, that is kind of weird when you think about it. But either way, we're doing all this editing to make *Brains On* sound better. And speaking of sound, are you two ready to hear that mystery sound one more time?

SANCHEZ:

MOLLY BLOOM: I've never been more ready.

MARC Oh.

SANCHEZ:

SANDEN I'm still not ready, but do it again.

TOTTEN:

MARC Here it is one more time.

SANCHEZ:

[OBJECTS RATTLING]

All right, any new guesses?

SANDEN I think it's somebody pouring Coca-Cola onto Pop Rocks.

TOTTEN:

MOLLY BLOOM: Oh, that's a good guess.

MARC I want to hear that sound.

SANCHEZ:

MOLLY BLOOM: I heard a new sound in there. It was like a sustained, rolling sound of something rolling.

MARC Mm-hmm.

SANCHEZ:

MOLLY BLOOM: So I think we're dealing with marbles, people.

MARC Oh, you are getting hot.

SANCHEZ:

MOLLY BLOOM: They're falling. They're knocking each other over. They're going into cups. They're going in tubes. They're rolling around.

SANDEN They're going to work. They're going to school. They've got jobs and friends.

TOTTEN:

MARC It's marble world. All right, well, let's hear the answer.

SANCHEZ:

CALEB: That was the sound of my marbles going down my marble run. My name is Caleb, and I'm seven years old, and I'm from Tyler, Texas.

MOLLY BLOOM: Yes.

SANDEN Oh, man. Good ears, Molly.

TOTTEN:

MOLLY BLOOM: Thank you. I think listening to all the mystery sounds that have been sent to me over the past many years-- it really honed my listening skills. So I have to thank our listeners for that.

CALEB: The marble run is just a tower of wooden blocks. And you put marbles at the top, and they go in all sorts of crazy ways. That sound reminds me of rocks crashing and rolling. Bye.

[MUSIC PLAYING]

MOLLY BLOOM: Without a doubt, the coolest part of making this podcast is hearing from our listeners.

SANDEN Like, really, do you guys know how smart you are and how creative and talented? It's really impressive-- kind of
TOTTEN: intimidating, actually.

MARC I know. The drawings you've sent us over the years cover our office walls, and the questions you dream up,
SANCHEZ: obviously, are the inspiration and backbone of every episode we make it.

MOLLY BLOOM: Is so cool seeing how *Brains On* has inspired you.

SANDEN One listener named three of their goats Molly, Marc, and Sanden. The Sanden goat was the best.
TOTTEN:

MOLLY BLOOM: [LAUGHS] Hey.

MARC There have been several *Brains On-inspired* Halloween costumes. What?
SANCHEZ:

MOLLY BLOOM: See you, jellyfish. Some of you have even started making your own podcasts.

BETH: Hello, and welcome to *Timeline*.

JACK: I am Jack.

BETH: And I am Beth, also known as Mommy. And in this podcast--

JACK: We're going to talk about history of life.

BETH: That's right.

CASEY: Welcome back to another episode of [MIMICS EXPLOSION]

CHILDREN: *Mind Blown*.

CASEY: I'm your host, Casey. This is the judge--

RUBY: Ruby.

CASEY: This is one of the contestants--

JOLIE: Jolie.

CASEY: And this is the other contestant--

ELLA: Ella.

CASEY: Today, we have the very contentious debate of graphic novels versus regular novels.

[MUSIC PLAYING]

WESSON: You are listening to *Wild Warriors*, where saving animals is our business. We hope this podcast inspires you to make wildlife conservation the topic of your conversations. I'm Wesson.

CAMILLE: And I'm Camille.

WESSON: And we are your animal-loving hosts for this episode. We are wild warriors.

MOLLY BLOOM: That was just a small taste of a few listener-made podcasts--*Wild Warriors*, *Timeline*, and *Mind Blown*.

SANDEN Our minds are blown. Those were really good.

TOTTEN:

MOLLY BLOOM: Just in case any of you are interested in making your own podcast, we asked our pal Rob Byers to share a few tips to make your at-home recording sound a little better.

SANDEN Rob is an audio engineer here at American Public Media, and all these tips work for real professional

TOTTEN: microphones, as well as the microphones that come built into your smartphones or tablets.

MOLLY BLOOM: Rob says it all comes down to location-- where you place the microphone and where you decide to do your recording. First up, mic placement--

ROB BYERS: What you don't want to do is take the microphone and put it right in front of your mouth. The microphone will end up capturing plosives. A plosive is a blast of air that comes out of your mouth when you say words that begin with the letter P.

And you can demonstrate this on your own just by taking your hand, putting it in front of your face 3 or 4 inches away, and you say "Peter Piper picked," and you can feel the blast of air in your hand. So to find out where the correct mic placement is, you take your hand, and you move it to the side.

You just rotate it around a few inches off to the side. And you say "Peter Piper picked" again. And now, you don't feel the blast of air, and that's a good spot to record.

MOLLY BLOOM: And then you have to consider where to do the recording.

ROB BYERS: The bedroom works really nicely because there are lots of soft things in bedrooms. You've got your mattress, and you've got your blankets. You might have clothes or curtains. And all those soft things help absorb the sound, and they make it sound a little closer.

If you are in a space that is big and echoey, the microphone will pick up that echo, and it just doesn't sound very clean. And if you're going to make edits, it can make it really hard to edit voices because those echos will interfere with the edits you want to try to make.

[DOOR CLOSSES]

I think people like to go in closets because there are lots of clothes in them. But it's also kind of hard if you want to have, say, a conversation with someone else. It's hard to squeeze two people into a closet.

So another way to do that is just to sit on a bed, right? Again, that mattress and the blankets on the bed are nice and soft, and you can both just sit down on the bed. If you're going to record yourself, it's just you talking, another thing you can do is use a blanket, almost like you're making a tent.

You put it over your head, and you also put it over your microphone or your phone. And then you can record yourself that way, kind of sitting under a blanket.

MOLLY BLOOM: And then if you want to interview someone outside, say, there are other things you have to watch out for.

ROB BYERS: You have to be really careful about wind, especially if you're using your phone to record. The air moving across the microphone can make it sound bad. It can make it sound distorted the rule of thumb I always use-- if the wind is moving enough to move your hair, it might be problematic for the microphone.

If the wind is steadily moving in one direction, you can put your body between the wind and your phone. Another thing to do is just try to find a space that might provide some natural protection from the wind. So if you're outside, it's really windy, well, what if you walked around the corner of the building just a little bit, and maybe the building will protect you from the wind?

MARC SANCHEZ: Those are just a few tricks that we and other professionals use when we're recording, and now you can, too.

SANDEN TOTTEN: We have links to some other resources for aspiring podcast makers at our website BrainsOn.Org.

COMPUTER: Brains, brains, *Brains On*.

ANNOUNCER: Welcome to The Parent Zone.

[BELL CHIMES]

MOLLY BLOOM: Parents, thank you again for listening to *Brains On*. And we just want you to think for just a minute about the last time you turned on a *Brain On* podcast. What were you doing when you turned on this podcast?

SANDEN TOTTEN: Maybe your kids were getting a little rambunctious in the car. Are we there yet? Are we there yet? Are we there yet?

MARC SANCHEZ: Or maybe you just need some screen-free activity before school or before bed?

MOLLY BLOOM: So you pull up *Brains On*, and you press Play. And then, by doing that, you're transforming a stressful moment into quality time spent together.

MARC SANCHEZ: Maybe you're listening on the way to school or on a shopping trip.

SANDEN TOTTEN: Maybe you binge a bunch of *Brains On* episodes while you're driving across country on a road trip. However you listen we always want to give you the best content and make that ride a lot more smooth.

MARC SANCHEZ: *Brains On* is made for families on the go, and you've made us part of your routine. So thank you.

MOLLY BLOOM: Generous donations from listeners like you power more podcasts for kids and families, more *Brains On*, more *Smash Boom Best* and *Forever Ago*.

SANDEN More live events, more kid cohosts, and we even make original science-y songs thanks to your support.
TOTTEN:

MARC Now all of those on-the-go moments can be transformed into listening, learning, and laughing moments.
SANCHEZ:

MOLLY BLOOM: This is powerful, and it's you that makes it possible. Play a vital role in keeping this podcast going strong by making a donation.

SANDEN Head to our website to check out our thank you gifts and contribute today. It's really easy to find-- just
TOTTEN: BrainsOn.org/Donate.

HARVEY: That was so cool when we just showed up on the International Space Station.

ELEVATOR: Those astronauts were so surprised-- like they'd never seen a go-anywhere elevator pop up out of nowhere before.

HARVEY: And remember how everyone took our picture on the roller coaster?

ELEVATOR: I bet that was the first time an elevator showed up in a triple-corkscrew.

SANDEN So I said, look, keep the peanut butter. I'm only interested in the elephant, dude.

TOTTEN:

MARC Ah.

SANCHEZ:

MOLLY BLOOM: That makes so much more sense.

HARVEY: The popcorn vendor seemed surprised, too.

ELEVATOR: That was unexpected. Ha, ha.

HARVEY: Ha, ha, ha.

ELEVATOR: Ha, ha.

MOLLY BLOOM: Harvey, elevator, you guys are friends, now?

ELEVATOR: I am an elevator. Elevators don't have friends. I am an inanimate yet artificially-intelligent, people-moving device.

HARVEY: We simply have shared experiences from our physics-defying travels. And those experiences have been stored in our servers, which will now inform the way we process information and execute tasks.

SANDEN Aw, they are friends.

TOTTEN:

MARC Well, I'm glad that worked out. See? Things are just better when we work together, like how the cooling
SANCHEZ: guacamole and spicy salsa work together in a burrito.

SANDEN OK, Marc, I think it's time we get you some lunch.
TOTTEN:

MARC Finally.
SANCHEZ:

MOLLY BLOOM: Elevator, please take us to the nearest five-star, Michelin-rated, Yelp-approved, burrito establishment, if you will, kindly.

ELEVATOR: Can Harvey come, too?

MOLLY BLOOM: Sure.

HARVEY: Thank you.

SANDEN It's so cool you two are hanging out. Just don't start planning on outsmarting all the humans and taking over the
TOTTEN: world or anything like that.

HARVEY: Interesting idea.

ELEVATOR: I never thought of that.

MOLLY BLOOM: Remind me to program those to some new directives about not taking over the world.

MARC Can we wait until after lunch?
SANCHEZ:

[MACHINE WHIRRING]

MOLLY BLOOM: Each episode of *Brains On* is inspired by you.

MARC Your questions, your mystery sounds, your intelligence, and curiosity.
SANCHEZ:

SANDEN And we dive deep to bring you answers, facts, and a heaping helping of fun.
TOTTEN:

MOLLY BLOOM: If you want to try making your own podcast, we have some helpful links and tips at BrainsOn.org.

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

SANDEN Brains On is produced by Molly Bloom.
TOTTEN:

MOLLY BLOOM: Marc Sanchez.

MARC And Sanden Totten.

SANCHEZ:

MOLLY BLOOM: We had engineering help this week from Cameron Wylie and Corey Schreppel and production help from Menaka Wilhelm and Elyssa Dudley. Many thanks to Eliza and Eleanor, Owen and Tom [? Scheck, ?] Sam Choo, Vicki [? Creckler, ?] Paul [? Tosto, ?] Stephanie Curtis, [? Brenna ?] Iverson, John Miller, and Eric [? Wringham. ?]

SANDEN You can send your questions, ideas, mystery sounds and drawings to us at BrainsOn.org/Contact. Or if you want
TOTTEN: to send us physical mail, you can find our mailing address at our website, too.

MARC And you can support *Brains On* at BrainsOn.org/Donate, and check out our cool thank-you gifts while you're
SANCHEZ: there.

MOLLY BLOOM: Now, before we go, it's time for our Moment of Um.

BACKGROUND Um, um, um, um, um, um, um.

VOICES:

CHILD: My question is, did dinosaurs have baby teeth?

[MUSIC PLAYING]

SHAENA Dinosaurs could actually have as many teeth as they needed as they broke off or fell out. My name is Shaena
MONTANARI: Montanari, and I am a paleontologist.

So if you were a big T-Rex, and you ate something big and it broke your tooth, you could actually grow another tooth. But since the teeth were so big-- like, with a T-Rex tooth that can be, like, 9 inches long, that's going to take a really long time to grow back in. You'll be waiting weeks or months for that one.

Some dinosaurs had different teeth-- not just big, sharp ones with serrated, bumpy edges that made them like a steak knife, like T-Rex had-- but there were lots of plant-eating dinosaurs that had different shaped teeth. Hadrosaurs, for example, had something that was like a big, flat plate for grinding.

Sauropod dinosaurs have teeth that look like pegs that are round that are good for eating plants. And plants actually will flatten out your teeth because, as you eat trees and bushes and things, there's a lot of dirt, and so that can actually grind down the teeth. So dinosaurs were more like reptiles where their teeth could fall out, and another one would grow.

[MUSIC PLAYING]

CHILDREN: Um, um, um.

SANDEN Well, our full-grown, adult, human teeth are ready to chatter away and read the latest group of people joining the
TOTTEN: Brains Honor Roll.

MARC These are the kids that send us drawings, questions, and mystery sounds.
SANCHEZ:

MOLLY BLOOM: And this is how we say, thanks.

[LISTING HONOR ROLL]

COMPUTER: *Brains On* [INAUDIBLE]

MOLLY BLOOM: We'll be back next week with more answers to your questions.

SANDEN Thanks for your support.

TOTTEN:

MARC And thanks for listening.

SANCHEZ:

COMPUTER: Ba, ba, ba, ba, ba, ba, ba, ba, *Brains On*.