

**GUS:** You're listening to *Brains On!*, where we're serious about being curious.

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

**BOB:** OK. Bob's Log, day 197. Let's see, what happened today?

Well, I took a stroll around the neighborhood. There are fewer people out walking these days. I guess the weather is starting to cool down. It was perfect for me, though.

I got to wear the turtleneck I've been knitting all summer. It's the most eye-catching color-- bright beige. I actually spun the yarn myself, too. It's made of old shoelaces, eyebrow trimmings, and dryer lint. I'm pretty proud of how it turned out-- very warm.

And speaking of eyebrow trimmings, I gave myself a trim today, too. My brows seem to be having a growth spurt. Maybe it's the change of seasons? I'll have to remember to chart that separately in my brows log.

Oh! And I tried a new porridge recipe.

[LAUGH]

That went well. Yep. I found the recipe on my favorite new website-- [bandalicious.com](http://bandalicious.com).

[LAUGH]

And, well, that's how my day is going, so far.

I'm actually looking forward to this afternoon. I've planned to organize my socks in grayscale order-- white to light gray to dark gray, of course-- and catch up on listening to *Brains On!*

[MUSIC PLAYING]

**MOLLY BLOOM:** You're listening to *Brains On!* from American Public Media. I'm Molly Bloom. And my co-host today is our old pal Gus from Seattle. Hi, Gus.

**GUS:** Hi.

**MOLLY BLOOM:** Gus has been our co-host for all of our episodes about the coronavirus and the pandemic we're living through now.

**GUS:** "Pandemic" is the word we use when a disease is present all over the world.

**MOLLY BLOOM:** Right. So last time we talked, Gus, school was just starting up again. How has the last month been?

**GUS:** Um, it's been pretty good. Um, school has been a little boring, but that's fine.

[LAUGH]

**MOLLY BLOOM:** Can you remind us how you're going to school, virtual, hybrid, in-person?

**GUS:** Oh, yeah, I've been doing it virtually. Um, it's been working pretty good. Even though it is online, it's still pretty good.

**MOLLY BLOOM:** So what would you say is like one thing you like about virtual school?

**GUS:** Well, it's a lot less like frantic, I guess. You don't have to run from class to class. You don't have to-- yeah, you get breaks and stuff. And it's just one thing, but like on a laptop.

**MOLLY BLOOM:** What is one thing that you miss about regular school?

**GUS:** Um, the giant playground, for sure. Our school had a pretty good-- pretty big playground. But now that we're at home, I can't go back to it.

**MOLLY BLOOM:** Are there ways that you're finding to socialize with your friends now that you're not in school with them?

**GUS:** Yeah. Um, let's see. I've been going over to a couple of friends' houses, not inside their house, but like in their backyards. We've been playing. And we've been on calls and stuff.

**MOLLY BLOOM:** Cool. What would you say is your favorite thing to do these days?

**GUS:** Well, I like playing video games, of course. But I also like-- I've also recently been liking bird watching and like--

**MOLLY BLOOM:** Oh, cool.

**GUS:** --taking pictures of the animals in my neighborhood, even like squirrels and stuff. There's this one squirrel that hangs from sunflowers and bites off seeds and stuff. It's pretty funny.

[LAUGH]

**MOLLY BLOOM:** That's really cool. You're kind of like observing the nature that's around your neighborhood.

**GUS:** Yeah.

**MOLLY BLOOM:** Why did you get interested in bird watching?

**GUS:** There were two crows that I named, Captains Ruffles and Samuel. And they're cops, trying to catch the sunflower bandit.

[LAUGH]

That's how it that's how it all started.

**MOLLY BLOOM:** I see. So there's a whole, like active narrative going on.

**GUS:** Yeah. There's also Special Agent Sea Bill, the seagull, there's Lieutenant Stellar, the Stellar's jay. He's in charge of the SWAT team.

[LAUGH]

And Captain Ruffles is chief of police.

**MOLLY BLOOM:** Of course.

**GUS:** Samuel is his best detective.

[MUSIC PLAYING]

**MOLLY BLOOM:** Well, it's been a little over six months since this new coronavirus changed our lives. And there are lots of different ways to mark this time.

**GUS:** If you haven't had a haircut, your hair probably grew around 3 inches.

**MOLLY BLOOM:** In these six months, monarch butterflies from Canada have finished a giant migration loop. They flew all the way to Mexico and back again.

**GUS:** The Earth has orbited halfway around the Sun.

**MOLLY BLOOM:** The planet Mercury has actually gone around the Sun twice.

**GUS:** That's two years on Mercury.

**MOLLY BLOOM:** So, yeah.

**GUS:** It's a pretty big chunk of time.

**MOLLY BLOOM:** Also, if you were six years old or nine years old, six months is a way bigger chunk of your overall life than it is for someone who is 36 or 79 years old.

**GUS:** So these past six months have felt very long at times. But, also, sometimes like it's gone very fast. I don't even know how that's possible.

**MOLLY BLOOM:** Well, we asked a psychology researcher about that. Her name is Ruth Ogden. She's been studying how people are feeling about time during the pandemic.

**RUTH OGDEN:** Time is really weird at the moment.

**GUS:** I knew it. It's not just me.

**MOLLY BLOOM:** Yeah. Ruth surveyed people in the UK and most said time right now definitely feels different.

**RUTH OGDEN:** About half of people thought it was passing much quicker than normal. Half of people thought it was passing much more slowly than normal. So what that tells me is that what you do is influencing how you feel about time during coronavirus.

**MOLLY BLOOM:** So, Gus, which camp are you in these days? Does it feel fast or slow?

**GUS:** Well, it's been kind of half and half, you know. During the summer and last year, when we didn't have the online school thing quite figured out, it was going pretty fast. I had more time to myself. I had stuff to distract me.

But now that I'm back in school again, and I have more to do, it feels like it's going slower. So I think that when I'm doing stuff I want to do, or things that I find fun, things go fast.

Yeah, for me, it's been going-- like the days themselves feel really long. But then, when I look at time all together, I can't really believe that it's October. So it's going fast and slow at the same time, which is a really weird feeling. But, yeah, there have definitely been like some slow times this year.

**RUTH OGDEN:** We tend to find that people experience time slow when they're bored. And the reason for that is probably that we're looking at the clock a lot. We're not enjoying those activities. And we want them to be over.

So we're looking for when they're going to finish. That makes us very aware of time. And that makes it drag.

**MOLLY BLOOM:** We look at the clock a bunch when we're bored, because we use outside cues to help us keep track of time. We don't actually have a specialized timekeeper in our bodies, the way we have taste buds to taste, or eyeballs to see.

**GUS:** We use lots of different parts of our brains to form our idea of time.

[TICKING]

**MOLLY BLOOM:** And since our emotions and experiences also come from our brain, they affect our internal sense of time.

**GUS:** Whether it's dragging on forever, or whizzing right by.

[SPED UP SOUND EFFECTS]

**MOLLY BLOOM:** Another reason time has weirded out, our older routines are pretty much gone.

**RUTH OGDEN:** So like all the little things, I would call them like markers, like they hold us in our day, don't they?

**GUS:** Right, like leaving the house or coming home.

**MOLLY BLOOM:** Those markers aren't necessarily there for us anymore.

**RUTH OGDEN:** So we're kind of a little bit lost in time without them. And I think when we're a bit lost in time, it makes it very difficult for us to know what's going on.

**MOLLY BLOOM:** So basically, it's not just you. Time is acting weird for a lot of people.

**GUS:** Interesting. Before we move on, can I get one more round of those slowed down sound effects?

[SLOWED DOWN SOUND EFFECTS]

**SPEAKER:** Definitely. *Brains On!*

**MOLLY BLOOM:** So even though many of us have spent the last six months waiting and getting into a new kind of routine, scientists have been very, very busy.

**AASHISH** Things are changing so fast.

**MANGLIK:**

**MOLLY BLOOM:** That's Aashish Manglik.

**GUS:** He's a physician scientist at the University of California, San Francisco.

**AASHISH MANGLIK:** Yeah. I think the most amazing thing about the coronavirus pandemic for the scientific community has been the remarkable alignment of almost every biological scientist or biomedical scientist towards a common goal.

**MOLLY BLOOM:** It's like, imagine if the Avengers, the Jedi, every Transformer, both Anna and Elsa from *Frozen*, the Incredibles, Dwayne the Rock Johnson, and every other hero you can think of teamed up to fight the same enemy. That's what's happening in science right now.

**GUS:** Since many of you have sent in questions wanting to know what the future holds, we asked Aashish and a few others what they think things will be like six months from now?

**ROXANNE KHAMSI:** It's going to be the start of spring.

[MUSIC PLAYING]

I think that things are going to be much better six months from now.

**GUS:** That's Roxanne Khamsi. She's a science reporter based in Montreal.

**MOLLY BLOOM:** Roxanne is hopeful. Even though six months is short in science time, in the last six months we've already learned so much about this new coronavirus and what it does to our bodies. And one of the things that we've made a lot of progress on is vaccines.

**ROXANNE KHAMSI:** Did you know that there are 38 vaccines that are being tested in humans right now?

**MOLLY BLOOM:** And that number has actually gone up since we talked to Roxanne. It's 44 now. And there actually may be even more by the time you hear this. Vaccines are super powerful tools in the fight against a germ like coronavirus. Here's how they work.

**GUS:** When your body encounters a virus for the first time, it's not quite sure what to do with it. So a virus gets into your body.

**VIRUS:** Hello. Nice body got here!

**BODY:** What's this. Who are you?

**VIRUS:** I think I'll make myself right at home.

**BODY:** Oh, no! Get out of here! These cells are mine.

**MOLLY BLOOM:** When your body realizes this virus is no good, it engages the immune system to attack.

**VIRUS:** I'm a friendly virus, I swear. You've got all of these cells. You can't possibly be using all of them.

**BODY:** Immune system, come on. I need you!

**IMMUNE SYSTEM:** Here we come!

**MOLLY BLOOM:** Then the immune system creates antibodies that can latch onto the virus and neutralize it.

**IMMUNE** This antibody will be a perfect fit.

**SYSTEM:**

[POP]

**ANTIBODY:** Hello, little virus. I'm an antibody. And your time in this body is coming to an end.

[ZAPPING]

**VIRUS:** Aw, dang it.

**GUS:** And then these powerful things in your body, called T cells, come along and destroy the viruses that have been tagged by the antibodies.

**T CELL:** Here we come! Here we come! T cells on the way, coming to make the virus pay.

**VIRUS:** Double dang.

[OUCH]

[MUSIC PLAYING]

**MOLLY BLOOM:** But the problem is, in the time it takes your body to recognize the virus and make antibodies, you can get sick.

**GUS:** So wouldn't it be great if your body could recognize a new virus right away, before you felt sick?

**MOLLY BLOOM:** That's where vaccines come in. Vaccines expose your body to a virus or bacteria in a safe way. So your body can learn to recognize it and how to fight it, without you getting sick first.

**GUS:** A lot of times, vaccines have a weakened or inactive version of a virus, or maybe just a part of a virus.

**MOLLY BLOOM:** Your body learns to recognize and destroy those less harmful versions, so if you ever encounter the real virus, it's ready to fight right away. Vaccines train your body to fight.

[BELL CLANG]

This time around, there's a new kind of vaccine that scientists are working on developing, which is much faster to make than the existing kinds of vaccines.

**ROXANNE**  
**KHAMSI:** No one's ever really done this yet, but they're trying it with coronavirus, which is where they get the genetic sequence, which is the code that makes the virus. And they tweak it just a little bit. And then they inject it into people, just the portion that they need to help train your immune system. So what I'm really optimistic about is that in the future, we'll just be able to kind of print our own super fabulous vaccines going forward, if this works.

**MOLLY BLOOM:** It is possible that six months from now scientists will have identified a vaccine-- or more than one vaccine-- that works.

**GUS:** But it will still take time to make doses of a vaccine and get it to people around the world.

**MOLLY BLOOM:** Scientists are also working on studying existing medicines to see if any of them could help in the fight against this coronavirus.

**GUS:** And they're working on making brand new treatments, too.

**MOLLY BLOOM:** Here's Aashish again.

**AASHISH** In some ways, it's very hard to predict what six months would be like. We have some answers scientifically, but  
**MANGLIK:** what that means for people's lives is a little bit hard to know. Perhaps we'll have better ways of dealing with the viral infection for-- there's a lot of new therapies that are moving forward. And for people that are getting sick from the virus, we'll have new ways of tackling their infections and preventing them from getting sick.

**MOLLY BLOOM:** Aashish is working on one of these potential treatments.

**GUS:** Aashish studies proteins.

**MOLLY BLOOM:** And proteins make up a lot of important things in us, including antibodies.

**GUS:** And Aashish's his team is working on something called nanobodies.

**MOLLY BLOOM:** Nanobodies are like the antibodies we produce, but smaller. Llamas produce these naturally. And scientists have been inspired by these cool proteins.

**GUS:** So Aashish's team set out to find a tiny protein that would bind really tightly to the spikes that are on the outside of the coronavirus, and stop it from spreading.

**AASHISH** It's almost like a LEGO block, right. You have these little pieces. But then, depending on how you arrange them,  
**MANGLIK:** they can look like something completely different. And that's really how proteins work. And they have these little LEGO blocks, these amino acids that make them up. And you build them in various ways. And that gives rise to basically all of biology.

In a matter of about 12 weeks, we were able to find a nanobody that binds the spike protein really, really, really, really tightly. And when it binds that spike protein, it completely prevents the virus from getting inside human cells.

**GUS:** Stopping the virus from getting in our cells, that's a very good thing.

**MOLLY BLOOM:** Yeah! Aashish and his partners have been able to make these nanobodies in their lab for bacteria and yeast.

**AASHISH** So it basically prevents that initial first step of the virus even gaining-- opening the door to get inside the cell. And  
**MANGLIK:** what we've shown then, is that that's a pretty effective way of neutralizing the virus. And long term, we're hoping, in the next couple of months, to be able to really bring this potentially to studies in humans to see if they may actually prevent people from contracting the virus in the first place, or if they've already contracted the virus, from getting quite sick from it.

**MOLLY BLOOM:** So it's exciting. But we need more tests to make sure it works and is safe.

**GUS:** But in the meantime, while we're waiting for vaccines and new medicines, Juliet Morrison says we should keep using the tools we have because they're working.

**MOLLY BLOOM:** She studies viruses at University of California, Riverside.

**JULIET MORRISON:** We actually have a lot of power, ourselves, to protect ourselves. And that by doing certain basic things, that people have been suggesting, as washing your hands, and being more careful, and wearing masks-- it's very powerful. You can actually protect yourself, and to protect your loved ones.

And we're actually seeing the effect also on influenza. Now, we are having a much lighter influenza season because people have been wearing masks. So something as simple as a mask, maybe this is something we should do every flu, season. perhaps.

[MUSIC PLAYING]

**MOLLY BLOOM:** So in six months, we will know more about how to fight this coronavirus and viruses in general.

**GUS:** And here at *Brains On!*, we'll keep working to bring you updates as research moves forward.

[MUSIC PLAYING]

**MOLLY BLOOM:** OK. Gus, are your ears warmed up and ready?

**GUS:** Yeah.

**MOLLY BLOOM:** All right, it's time for the mystery sound.

[MYSTERY SOUND]

**GUS:** Spaghetti, all the way, boiling it.

**MOLLY BLOOM:** So that's what you think is boiling spaghetti?

**GUS:** When you slap the butter in, and then you put in all the boiling water, and then stick the spaghetti-- like not strings, but like hairs.

**MOLLY BLOOM:** Mmhmm, the stands.

**GUS:** Yeah. It's that's a fun thing to do.

[LAUGH]

**MOLLY BLOOM:** All right, so your guess is boiling water for spaghetti?

**GUS:** Yeah. I can't be 100% sure. But that's what it very much sounds like.

All right, it's an excellent guess. And we're going to be back, give you another chance to guess in just a tiny bit.

[MUSIC PLAYING]

**MOLLY BLOOM:** Did you know the *Brains On!* crew wrote a book. It's true. We did. It's called *Brains On! Presents, It's Alive-- From Neurons and Narwhals to the Fungus Among Us*.

We are so proud of how the book turned out. But you don't have to take our word for it.



**INIYA RAJAN:** Hi, I'm Iniya Rajan. I'm 11 years old and I live in Texas. I've been listening to the Brain On! for quite some time. And I was super thrilled when the book, *Brains On! Presents, It's Alive* came out.

I got it as a birthday gift. And I instantly loved it. The book is amazing. It is chock full of facts, but it also has cool games and fun drawings on the side.

It is super fun to read. And I know that I have learnt so much from it. It is a great addition to my book shelf. And I highly recommend it for anyone who loves fun and learning.

**GUS:** You can find out more about the book at [brainson.org](http://brainson.org).

**MOLLY BLOOM:** And while you're there, we'd love for you to send us your questions, ideas, mysteries sounds, drawings, and high fives.

**GUS:** That's what this listener did.

**KADIRY:** Hello, *Brains On!* My name is Kadiry from Astoria, New York. And my question, is how come while we walk, our hands always move back and forth? Thank you. Bye.

**MOLLY BLOOM:** We'll be back with an answer to that during our moment of um, at the end of the show.

**GUS:** Plus, we'll read the most recent group to be added to the Brains Honor Roll.

**MOLLY BLOOM:** So keep listening.

You're listening to *Brains On!* I'm Molly.

**GUS:** And I'm Gus.

**MOLLY BLOOM:** And our pal Ruby is going to help us answer these questions.

**MOLLY:** My name is Molly. I'm nine years old. And I live in Hopatcong, New Jersey. My question is, there been any other pandemics besides this one? And if so, can you describe them?

**AUGUST:** Hi, I'm August. And I'm from San Francisco. My question is, what other major pandemics have been in recent times?

**MOLLY BLOOM:** Ruby should be here to answer any second now.

**RUBY GUTHRIE:** Hey, sorry I'm late. I was deep in the Brains On! archive. Wow, the past is so wild. Did you know people used to listen to music on these tape things called cassettes, like even before CDs? Check it out.

[MUSIC PLAYING]

Ancient history is so cool.

**MOLLY BLOOM:** Those are my mix tapes from middle school actually.

**GUS:** What do you have there, Ruby?

**RUBY GUTHRIE:** Well, this is a collection of documents I found all about another big pandemic that rocked the world. It happened about 100 years ago. It was caused by a powerful flu virus that also spread around the globe.

[MUSIC PLAYING]

The year is 1918. The streets are filled with more horses and buggies than cars. Most people don't even have electricity in their homes yet. And if you went to the movies, a ticket would only cost \$0.07. Sounds hotsy-totsy if you ask me-- that means "sounds perfect" in 1918 slang.

[MUSIC PLAYING]

The US is also fighting in World War One. So all of our attention and resources were going towards the war effort. Soldiers were getting shipped overseas, crossing borders, and sharing lots of tight spaces-- and as it turns out, spreading a virus.

It's debated when and where the pandemic began, but many historians think it started at an army base in Kansas.

**REPORTER:** This just in from Fort Riley! Last week, over 100 soldiers came down with the flu. And now cases have quintupled just in the past week.

**RUBY GUTHRIE:** Over the next six months, the flu swept the globe. It's estimated between 1918 and 1919, about one third of the entire global population was infected with the virus. The pandemic peaked in the US after the second wave hit in September, lasting into December.

Some schools closed, public gatherings were frowned upon, and citizens were encouraged to wear masks. Sounds familiar, right?

**GUS:** Yeah. Wow. So us humans have dealt with things like this coronavirus before.

**MOLLY BLOOM:** Yeah. And I'm guessing we found a way to get through that flu?

**RUBY GUTHRIE:** We did get through it. But it's hard to say exactly when it ended. Unlike the war, there wasn't a specific date when the pandemic was over. It's not like we could just make a treaty with the virus.

**WORLD LEADER** Now, look here, influenza, we agree this pandemic has come to an end. Sign your initials on the dotted line.

**VOICE:**

**RUBY GUTHRIE:** So the virus didn't come to a crashing halt. Hundreds of thousands of people got sick, and many died. And we're trying to avoid that this time.

But as more and more people got infected, they also started to build up immunity to the virus. This took some time, over two years or so. Eventually, case numbers and death rates started to significantly decrease, especially compared to the peaks in the fall.

Places that had closed, like schools, churches, restaurants, and theaters, slowly reopened. And even after things started to reopen, sometimes they would have to close again if there was a sudden spike. We had to remain cautious and stay adaptable.

It's worth noting a lot has changed in the last century. After 1918, there was a bigger effort to study the pandemic and diseases in general. This led to more research on viruses, advancements with vaccines, and more data collection overall.

**SCIENTIST:** We better study this pandemic, and make sure we know what works. You know, just in case there's ever another pandemic, like in a hundred years from now. I don't know, int the super futuristic year 2020? Wouldn't that be bananas?

**RUBY GUTHRIE:** This momentum helped pave the way for institutions like the World Health Organization, which brings nearly 200 different countries together to work on all things public health. Nowadays, scientists and researchers can share their findings with people across the globe with a click of a button. There's a bigger sense of collaboration and community. And it's easier than ever to connect.

We may not know exactly how and when this pandemic ends. But we do know that the same precautions we're taking now, like wearing masks, social distancing, and washing our hands, they worked in 1918 to help slow the spread. And they'll still make a difference today.

**MOLLY BLOOM:** That's some seriously fascinating history, Ruby. Thanks for the perspective.

**GUS:** Yeah. And next time you got to tell me more about those ancient music tapes. Were those used by cave people? They sound so old.

**RUBY GUTHRIE:** I know, right? I can't even imagine.

**MOLLY BLOOM:** Good grief.

**SPEAKER:** Ba, ba, ba, ba, ba, ba, ba, ba, ba, ba, *Brains On!*

**MENAKA:** And now, advice from my grandma. It's me, Menaka. I call my grandma Aachchi because that's Sinhala for grandma. She's lived through a lot of changing times. So she has some great suggestions for you today.

**AACHCHI:** I deal with change by doing something pleasant, enjoyable. I am used to enjoying a good book. I always have a couple of books that I tried to read. But I also write. If I write, it's a relaxing thing for me.

So you have to find something that distracts you, anything that you like to do. Maybe it's coloring, maybe it is painting, maybe it is LEGOs, maybe it is playing a game with your sister or brother.

And I also like toys. I still like toys. I like things that work, computerized, tiny, little toys that will run on a desk, make a noise. Even though I am this old, I still like toys.

**MENAKA:** How old is this old, Aachchi?

**AACHCHI:** This old is 82 years old.

**MENAKA:** That was advice for my grandma. Why not ask some adults in your life how they handle tough times? I bet they'll have a lot to share. OK, bye for now.

[music playing]

**KARA:** I'm Kara.

**GILLY:** And I'm Gilly. And this is--

**BOTH:** Going viral with Kara and Gilly.

**KARA:** That's us.

**GILLY:** We're viruses.

**KARA:** So Gills, how you doing?

**GILLY:** Gotta be honest, Kare-bear, it's has been rough. I was going to travel the globe infecting noses all over the place this summer. You know, see Schnoz-tralia; kick back on Booger Beach, Florida; finally visit Snottingham, England.

**KARA:** Oh, wow.

**GILLY:** But then coronavirus showed up and ruined everything. Now, people are washing their hands, covering their sneezes, sanitizing. Wearing masks.

**KARA:** It's scary how effective those masks are.

**GILLY:** Right. Us regular old viruses don't stand a chance of spreading with humans on such high alert. It was a total bummer summer.

**KARA:** I feel your, Gill.

**GILLY:** So, instead, I've turned my attention to scrapboogering. Check it out.

**KARA:** Scrap booking?

**GILLY:** Scrapbookering. It's when I take articles, or pictures, or poems I wrote about this pandemic and glue them into a book with sticky boogies.

[SPLAT]

See?

**KARA:** Oh, hey that's a clipping from when coronavirus first made headlines. Oh, and there we are taping a podcast about it.

**GILLY:** Yep. And look, this pic is from when humans were running out of toilet paper.

**KARA:** As someone who spends a good deal of time in tissues, that had me freaked.

**GILLY:** Scrapboogering-- journaling-- making art-- it's all a great way to process your emotions right now. So that's why I'm making it today's show topic.

[MUSIC PLAYING]

So when you document your life right now, you're creating a primary source.

**KARA:** Oooh, a primary source, what's that?

**GILLY:** I thought you'd ask. Primary sources are documents, images, text recordings, other sources that were created during a time period being studied-- so like journals, or drawings, or letters. It's a history word.

I'm making my scrap-boog for future historians to use when they want to understand a virus's perspective on things.

**KARA:** So like, someday in the future, historians will use your stuff to understand this pandemmy?

**GILLY:** That's the plan. In fact, Viralinos, you should all consider documenting your own experiences too, like try journaling, or taking pictures, or collecting things related to the pandemic. Your stuff could be in history books or museums one day.

**KARA:** Now, you're making me want to start collecting important things for history, too-- like this piece of string. It's an important part of the pandemic because of-- uhh-- reasons.

**GILLY:** A for effort Kara. But if you do want to start a collection for people of the future, one thing to look for are seemingly trivial artifacts-- or ephemera-- as history thinky people call it-- stuff like posters, or signs that say "Closed for COVID," or masks, or even an empty bottle of sanitizer. Then store it all in one of those big plastic bins or a chest, so it's safe in one place.

**KARA:** I shall put my very important pandemic string in this shoebox to preserve it for all time.

**GILLY:** To inspire all our Viralinos, who plan to be future primary sources, like me, I asked Kieran Patel to join us. They're a student at the University of North Carolina, Chapel Hill.

Hi, Kieran.

**KIERAN PATEL:** Hi, Killy. Hi, Gilly. I guess it's nice to be here. I've never met talking viruses before.

**KARA:** I've never met a dog named Sandra before, but I hope to one day. I bet she's cute.

[BARKING]

**GILLY:** Don't mind her. So Kieran, you've been documenting the pandemic for history reasons, too. Tell us, why is this important?

**KIERAN PATEL:** I think in the moment, it can help you to think about what's going on and how you feel about it. And that can also actually help you remember not only the bad, but the good about that period of time once it's over.

**KARA:** My string helps me remember the time I found a string.

[BOING]

**GILLY:** So Kieran, what things should our Viralinos document? What did you document?

**KIERAN PATEL:** So the first couple of entries really had to do a lot with me noticing things around my home, looking outside. My window in my bedroom looks out over the street. So I would just sit in bed and look out at people taking walks.

I noticed a lot of neighbors or people who lived on my street that I never noticed before. And I found myself writing about them a lot. I put in a lot of small details that weren't really journal entries, but just little things like there were times I knew that I couldn't go to the grocery store because around that time of day it was super busy, or I noticed that the playground in my neighborhood had been completely roped off in caution tape, so that no one could use it.

**GILLY:** Yeah. Those are great details because when the world is back to normal, we'll probably forget how quiet everything is right now. Historians will want to know that stuff.

**KIERAN PATEL:** Yeah.

**KARA:** So once you document all this stuff, what do you do with it? I want to make sure my very important string collection makes it into the right hands.

**GILLY:** Good question, Kara. Turns out libraries, museums, and historical societies all over the world are already collecting things like drawings, pictures, and objects.

So Viralinos, if you want to help make history, ask your local library or museum if they're collecting primary sources, and offer them yours. If they are, great. If not, just hang on to what you've got. Maybe one day you can share the stuff with your great great grandviruses, or grandchild-- grandkidrens, kidderinos, whatever you call this little versions of people.

[MUSIC PLAYING]

**KARA:** Well, this has been an inspiring episode. I'm ready to primary source till the cows come home.

**GILLY:** Yeah. Kieran, do you want to add something to my scrapbooger before you go? There's some fresh snot paste with your name on it.

[SPLAT]

**KIERAN PATEL:** Oh, I'm all right, but thank you.

**KIERAN PATEL:** Whatevs.

[MUSIC PLAYING]

**KARA:** That's it for the show this week. Remember, stay infecty.

**GILLY:** And don't get sanitized.

[MUSIC PLAYING]

**SPEAKER:** Brains on, on, on.

OK, Gus, are you ready to make one more guess for today's mystery sound? Let's hear it again.

[MYSTERY SOUND]

**MOLLY BLOOM:** All right, Gus, what are your thoughts?

**GUS:** I still think it's boiling water or-- it doesn't have to be specifically spaghetti. I just think it's boiling something.

**MOLLY BLOOM:** That was a really good guess. Here is the answer.

**SAM:** Hi, I'm Sam from Novato, California. That was the sound of rice boiling. I recorded it because I like rice and also because I just like the sound of it. It's satisfying to hear.

**GUS:** Oh, rice is similar.

**MOLLY BLOOM:** Yeah. So you were 100% correct.

**GUS:** Yippe ki-yay.

[LAUGH]

Boiling food.

**MOLLY BLOOM:** Yes, boiling food. You're right. It was boiling food, rice food to be specific. Do you-- have you been cooking during the times at home? It sounded like you were familiar with the spaghetti making process.

**GUS:** Yeah, I make spaghetti all the time. That's a pretty easy thing. Occasionally, I make stir fry.

**MOLLY BLOOM:** Hmm.

**GUS:** But that's-- I know how to make mac and cheese, stir fry, and spaghetti.

**MOLLY BLOOM:** That's a pretty good repertoire.

[MUSIC PLAYING]

Time feels strange this year. Our routines have shifted a lot.

**GUS:** Scientists are working hard on vaccines and treatments and learning more about this virus.

**MOLLY BLOOM:** It's hard to say where things will be six months from now, but there are things you can do right now, like masking up and washing your hands, to keep you and your loved ones safe.

**GUS:** The world experienced a different global pandemic 100 years ago. And we learned a lot back then.

**MOLLY BLOOM:** And now we have even more science, collaboration, and technology to get us through this one.

**GUS:** In the future, historians will want to know how we live during this pandemic. You can help them by documenting your life right now.

**MOLLY BLOOM:** That's it for this episode of Brains On!

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

**MOLLY BLOOM:** We had engineering help from Andrew Walsh and Veronica Rodriguez and production help from Phyllis Fletcher and Christina Lopez. Special thanks to David Zha, Elyssa Dudley, Jennifer Lai, and Alex Flood.

**GUS:** Brains On! is a nonprofit public radio program.

**MOLLY BLOOM:** You can support the show and help us keep making new episodes at [brainson.org/contact](http://brainson.org/contact).

**GUS:** Now, before we go, it's time for our moment of ummmmmmm.

**KADIRY:** How come when we walk, our hands always move back and forth?

**RACHEL ADENEKAN:** Yeah, this is a great question. I've wondered it as well. And it ties into biomechanics, which is what I study. Hi, I'm Rachel Adenekan, a fourth-year PhD candidate at Stanford University's biomechanics lab and also the neuromuscular biomechanics lab.

We tend to swing our arms while walking in order to make it easier for us to balance and conserve energy. It's actually easier to balance and easier to conserve energy when we move our arms normally, than if we try to hold our arms still.

When you're moving and swinging your arms, you're not actively trying to move your arms. It's a natural motion that they just swing with you. But if you want to walk with your arms still, you're actively contracting your muscles to hold them in place. And so it requires more energy to do that.

So if you're walking, and you don't want to use the normal method of arm swing, it's difficult. But with enough focus, you can maintain it. But as you walk faster, and faster, and faster, and even get to a run, it becomes much harder to maintain. So you really tend to push back towards that normal arm swing motion.

[MUSIC PLAYING]

[LISTING HONOR ROLL]

**MOLLY BLOOM:** We'll be back soon with more answers to your questions.

**GUS:** Thanks for listening.