ANNOUNCER 1: This is a Curio from *BrainsOn,* where we're serious about being curious.

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

MOLLY BLOOM: You're listening to *Brains On,* from American Public Media. I'm Molly Bloom. Being left-handed or right-handed can definitely affect the way we experience life. Have you ever picked up a pair of scissors that just felt wrong in your hand? Usually, that mismatch is just a minor nuisance, but sometimes sidedness can change the future of an entire species. That's what our next piece is about.

The Natural History Museum in Los Angeles recently acquired a rare creature, after asking people to post photos on the iNaturalist app, which is used for identifying animals and plants, by scientists and citizens alike. High school senior Alex Bairstow, from Carlsbad California, posted a very odd, European garden snail. This kind of snail is usually dextral, meaning its shell is coiled up on the right side of its body. But this particular snail was different. Its shell coiled to the left.

[MUSICAL STING]

Now, this isn't like having curly hair versus straight hair. The side these shells coil toward dictates the direction of the snail's reproductive organs. So this snail won't be able to reproduce unless it finds another left-handed, or left-shelled, mate.

[PHONE DIALING]

[PHONE RINGING]

To learn more, we have reporter Chris Greenspon on the line, at the Natural History Museum in Los Angeles. Chris, tell us about this snail.

CHRIS GREENSPON: OK, well its name is Sandy the Sinistral Snail, and--

MOLLY BLOOM: Wait, wait, wait. Did you say Sandy the Sinister Snail, like an evil snail?

CHRIS GREENSPON: No, actually I said sinistral, which means left-sided. Sandy's not exactly evil.

SANDY THE SINISTRAL SNAIL: Yes, I am.

[MUSICAL STING]

MOLLY BLOOM: You gave it a microphone?

CHRIS GREENSPON: It just sort of took one. Look, researchers are trying to help Sandy, but this snail doesn't seem to have any interest in finding a mate.

SANDY THE SINISTRAL SNAIL: Forget it. The world ain't bad enough for two Sinistral Sandys.

MOLLY BLOOM: OK, well if scientists are looking for a second sinistral snail, it might help knowing how Sandy was found.

CHRIS GREENSPON: Oh, OK. That I do know. Here, listen. This is the guy who first spotted Sandy.

[ELECTRONIC CHIRP]

ALEX BAIRSTOW: Hi, my name is Alex Bairstow. I'm a senior at Escondido Adventist Academy and I found Sandy the Sinistral Snail. So I was at school before it started. And a friend and I went out, just to look for snails and whatever other creatures we could find. And we were at a ditch, behind the football field, and I just kind of noticed, out of the corner of my eye, of a garden snail that looked different. And I reached down, and picked it up, and saw that it was sinistral.

SANDY THE SINISTRAL SNAIL: True story. He kept me in his locker all day.

[DOOR CLANKING]

Then, he took me home--

[ENGINE NOISE]

--put me in a terrarium--

[THUNK]

--fed me cucumbers.

[CLOMP]

All in all, not a bad guy.

MOLLY BLOOM: Then, he posted a picture of Sandy on that iNaturalist app that we mentioned?

[SHUTTER CLICK]

CHRIS GREENSPON: Correct. The museum has a photo project on the app called SLIME, which stands for Snails and Slugs Living In Metropolitan Environments.

MOLLY BLOOM: Cute.

CHRIS GREENSPON: The object is to get people to help them find out where different snails live in Southern California, so they can see what types of environments they do well in, where they might be beneficial, where they might be pests.

SANDY THE SINISTRAL SNAIL: You're a pest.

CHRIS GREENSPON: So since the museum hasn't ever seen a living sinistral of this species, Alex brought it in for them to keep in their collection.

MOLLY BLOOM: Hmm. Did you find out why Sandy's shell coils to the left instead of the right?

CHRIS GREENSPON: Oh, yeah. I interviewed the researcher who started the SLIME project, Jann Vendetti. She's a malacologist, which means she studies things like clams and snails. Jan says it's because Sandy is a mutant.

[MUSICAL STING]

[ELECTRONIC CHIRP]

JANN VENDETTI: All of us have mutations, right? Every single individual human has mutations that are different from his or her parents. So we sometimes get mutations, just because our DNA is slightly different.

[MUSIC PLAYING]

CHRIS GREENSPON: If Sandy found a mate, we could learn more about this mutation.

SANDY THE SINISTRAL SNAIL: Well, what's it to you, no-shell? Why do you care if I ever find a mateless mutant?

CHRIS GREENSPON: It's nothing to me. But over time, you could help teach the whole world about genetics. Listen--

[ELECTRONIC CHIRP]

JANN VENDETTI: There's handedness, right, or body asymmetries that occur even in us, right? So our heart is not symmetrical, right? Certain body organs are on one side versus another. And there are human mutations where your internal body organs might be mirror image of what is considered normal. So there is a lot of interesting human applications to understanding why chirality, or coiling, or left-handedness or right-handedness happens. But nonetheless, it's an interesting phenomenon that is important in gastropods or snails, because certain lineages of snails are all left-coiling.

SANDY THE SINISTRAL SNAIL: Wait, certain lineages? Like, whole groups of sinistral snails?

CHRIS GREENSPON: Yeah. There are left-coiling sea snails. There are left-coiling tree snails. In Japan, there are left-coiling land snails with cool, yellow shells.

MOLLY BLOOM: Could Sandy partner with one of them?

SANDY THE SINISTRAL SNAIL: Wait a second, I don't want some rando partner. What if they're not into world domination and Minecraft like me?

CHRIS GREENSPON: It doesn't matter. They're different species, so they can't mate. Jan says they evolved separately.

[ELECTRONIC CHIRP]

JANN VENDETTI: For species to evolve, there has to be reproductive isolation. The basic idea is that if you are isolated from any other group, your group of organisms is going to accumulate genetic differences that are going to make them only able, or only want, to mate with other individuals that look like them.

SANDY THE SINISTRAL SNAIL: So it's pointless. I knew it.

CHRIS GREENSPON: No it isn't, Sandy. There's still the possibility of finding more sinistral Cornu aspersum for you to partner with, maybe even right here in LA.

MOLLY BLOOM: But Chris, if they did, would Sandy's offspring be left-coiling, too?

SANDY THE SINISTRAL SNAIL: Well?

CHRIS GREENSPON: It's not quite that simple.

[ELECTRONIC CHIRP]

JANN VENDETTI: There's a group in Great Britain who looked at a sinistral snail from Great Britain, and then two other sinistral snails from Spain, and they all mated. And there were a bunch of clutches of babies that hatched. And the babies that hatched were, I believe, all right-handed coiled offspring.

So why Sandy was born as a left-handed coiling snail, we don't know. And it could be that Sandy has many other siblings, who are also left-coiled, or there could be some other mechanism at play, such that a clutch of eggs could be part left-handed coiling or part right-handed coiling, or it could be that Sandy, individually, had a mutation that none of Sandy's siblings had, that made Sandy left-handed coiling, where everybody else was right-handed coiling.

SANDY THE SINISTRAL SNAIL: My parents could have been right-coiling dextral snails?

[MUSICAL STING]

CHRIS GREENSPON: OK, look, the museum doesn't know. But if you had offspring, eventually we might figure this mystery out.

SANDY THE SINISTRAL SNAIL: Well, it's not like I know any more than you do. Sinistral Sandy was born alone in this world and that's the way it's going to stay.

[WEEPING]

MOLLY BLOOM: Got anything else, Chris?

SANDY THE SINISTRAL SNAIL: Why am I this way?

[SOBBING]

CHRIS GREENSPAN: Well, it could be an advantage.

SANDY THE SINISTRAL SNAIL: [SNIFFLE] I'm listening.

CHRIS GREENSPAN: Here's what Dr. Vendetti said.

[ELECTRONIC CHIRP]

JANN VENDETTI: Certain lineages of land snails may have evolved because individuals that were sinistral survived, and weren't eaten by certain predators, because those predators may have co-evolved with this prey item being around so you eat it in a particular way. If you try to go for that individual, and you recognize it's a snail, but its shell is coiling in the opposite direction, you may not be able to get it. You may not be able to handle it and eat it, the same way that you're used to. So you might just say, like, oh, I don't know what's going on with this one, and leave it alone.

CHRIS GREENSPON: So if you pass on your sinistrality, one day it could help your evil descendants cheat death.

SANDY THE SINISTRAL SNAIL: Tempting, but how do I know it'll even get passed on?

CHRIS GREENSPON: You don't. But you should know that being different from the rest of your species actually gives you an evolutionary edge.

SANDY THE SINISTRAL SNAIL: What do you mean? Spit it out, now!

CHRIS GREENSPON: Remember what she said about reproductive isolation? This is how new species form.

[ELECTRONIC CHIRP]

JANN VENDETTI: If you're left-handed versus right-handed coiling, in snails, you are almost automatically reproductively isolated, right? So it could be a really quick way of creating a new species, because you're not going to be able to mate back and forth with left and right individuals. So if left-handed individuals mate with each other, they are on their own evolutionary trajectory, and reproductive isolation is almost instantaneously created.

[MUSIC PLAYING]

SANDY THE SINISTRAL SNAIL: So I have higher odds of creating my own species than a dextral snail would?

CHRIS GREENSPON: Theoretically.

SANDY THE SINISTRAL SNAIL: And you no-shells could figure out where I got my left-sidedness from?

CHRIS GREENSPON: Potentially.

SANDY THE SINISTRAL SNAIL: Long after I'm dead, huh?

CHRIS GREENSPON: Most likely.

SANDY THE SINISTRAL SNAIL: I'll do it. I'll find a mate.

CHRIS GREENSPON: Awesome.

MOLLY BLOOM: What would your personal ad say?

SANDY THE SINISTRAL SNAIL: Evil, left-coiled garden snail seeks same. Must love bad puns and slime.

CHRIS GREENSPON: So Sandy, what are your plans for your new species?

SANDY THE SINISTRAL SNAIL: World domination! [LAUGHS] And Minecraft.

MOLLY BLOOM: Want to help find a mate for Sandy? If you live in Southern California, you can contribute to the Natural History Museum's SLIME Project. And going on right now is their Snail Blitz. They want your photos of land-living slugs or snails. You can head to our website, brainson.org to find out how to submit your photos and help Sandy.

[MUSIC PLAYING]

Today's episode is part of the "All Kinds of Love" podcast series from Kids Listen. You can use the Kids Listen app, or go to kidslisten.org to find tons of other quality shows for young listeners on this theme, like "April Eight Songs and Stories."

They have a song about seeing your shining self, even on tough days, and a story about two sisters traveling with their wolf-- which sounds awesome, by the way-- and the trio run into a magical creature who needs their help. But to help, they'd have to break some rules and possibly anger a giant. Find out what happens in the "April Eight Songs and Stories" podcast.

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

[MUSIC PLAYING]