***Citizen Science: Stories of Science We Can Do Together***

**Season 2, Episode 6: Sharing Citizen Science**

*[Theme music]*

**Bob Hirshon**

Welcome to Citizen Science: Stories of Science We Can Do Together! Coming to you virtually live from SciStarter's Virtual World Headquarters! In this episode, citizen scientists tell us how they joined the citsci community and how they share citizen science with others.

*[Theme music fades out]*

Hi, I'm Bob Hirshon. Citizen Science enables people from all walks of life to advance science research. It's a collaboration between scientists and people who want to contribute to scientific research by collecting data, analyzing images, and making observations. And it's a community, where people come together for a common purpose, and share their interests with others. For today's show, we asked you, our citizen science volunteers, for stories about how you've engaged your friends, family, students or complete strangers in citizen science, and/or how you got involved in citizen science yourself: who or what inspired you to sign up for that first project?

To start us out, here's Allysa Reese, a science teacher drawn to the world of citizen science by the Covid pandemic, and the urgent need to stay engaged with her students in challenging times.

Allysa Reese

My name is Alyssa Reese and I work at New Tech High in Coppel Texas. And I'm a biology facilitator for 9th graders.

Bob

Hey, Allysa! You mentioned in your email that you had worked with citizen science with your students, but I wonder if you had any familiarity with it before that?

Alyssa

Yeah, so long story short, I have struggled doing labs as a science teacher over the years. And I'd heard of citizen science and it's pretty awesome. But I hadn't really been able to jump into it. I'd keep saying I would and I would and I would. And finally when COVID hit that's when I was like, Okay, citizen science is how we're going to do some science work at home. (laughs) So that's when I jumped in.

Bob

Okay, so how did you introduce them to it? What sort of things did you do?

Alyssa

So I invented this thing called a Biodex, and it's not a super new invention, right? Other teachers have done this over the years. But I just reframed it and called it a Biodex and said "You're gonna catch all the living things you can find in photos. And had them use the Seek app. So that they–

Bob

Wait, why "Biodex"? For people who aren't following that...

Oh, like, yeah, yeah, yeah, it's like a Pokedex in Pokemon, where they gotta catch 'em all. Gotta catch all the Pokemon. And so it's gotta catch all the living things: a Biodex. So they were using the Seek app to do that. A couple of them started using Plant Snap and what not. And they were supposed to find as many different species as they could, and then whenever they found something that they couldn't identify, that's when they would upload to iNaturalist and really help that research project figure out what is this thing, why is our algorithm not able to understand and figure this species out. And the main thing was I wanted to get them outside, taking care of their mental health and taking breaks from the devices and all the stress of this pandemic hitting. So a lot of them found it to be pretty great.

Bob

So I know you weren't with them, so it's hard to know how they're reacting, and everything, but what have you learned about their involvement?

Alyssa

So we did this all throughout last year. So the first kids that did it, they did it Spring break to the end of the year, only about 8, 9 weeks of it. The kids last year did it for a good eight months of the school year. And I made them do a certain number of species each week, and put it in this little journal where they put thoughts and record real scientific thinking about things. Well, I had a lot of kids complain about it during the year, and they tend to complain about anything that's frequent, like every week. But I've had kids come into my classroom, probably three or four times since the school year started, it's been two months, you know. And this year, they've said "Well, I kind of miss doing it. It's really nice to get outside and look around and see new things." One of the kids said they're still adding to this journal they were doing every day, and using Seek every day. Another kid said that every time they see something new, they go "Oh, my goodness: Biodex!" And they pull out their app, even though they don't have to do it anymore. So It's been nice to see that they're actually looking at the world around them. Some of them are still contributing to citizen science projects, and now I've opened it up to a group that comes together on Fridays. We have a very flexible Friday at our school here at New Tech. And they come together on Fridays and do whatever Citizen Science project they're interested in that they can do at the moment. So if they don't have the materials or what not, then they pick a different one.

Bob

Do you know what they're doing when they come together? Is it still iNaturalist, or other things?

Alyssa

Let's see... one of them was helping with a project to increase disability awareness in different cities, projects to make sure the streets are set up right. One of our kids is doing the light pollution one, where they go outside and report light pollution where they live. We've got kids doing the cams where they take wildlife photos and need to identify what organisms are in this photo, what are they doing. We have a lot of kids doing different cam projects. So those kinds of things.

Bob

It's like a citizen science army!

Alyssa

(laughs) Oh, slowly but surely!

Bob

And you mentioned that you have an opportunity now to introduce it to other grade levels? What's that about?

Alyssa

Yes, so because we have what we call Flex Fridays at our school, we don't do a normal school day schedule. We let the kids choose kind of like they're in college; we let them choose their schedule for the day. And so I can have kids come into that session from any grade level and come do this citizen science stuff. And so it has kids from, let's see, from every single grade level now that have been coming to do this.

Bob

Wow! So cool. Do you have anything else you'd like to share?

Alyssa

Oh, man, I just love that there is a community out there where citizen science projects are collected. It is fantastic. I'm super excited about it and I feel like there are too many cool things I want to do. But my big dream is that I will get my family into it soon. I see us, you know, sitting around on couches during a holiday, and just like going at it, and showing each other the cool stuff we're finding. I'll let you know if that good nerdy moment ever happens.

Bob

Yes, follow up! Well, thanks so much!

Alyssa

You're welcome, thank you. Have a great day.

Bob

Alyssa's students have tremendous access to citizen science opportunities and a great teacher to guide them. Sumit Banerjee is a graduate student in India who participates in citizen science today and shares citizen science ideas with his peers in India, but had very few such opportunities when he was in high school.

Sumit

To me, citizen science, I was introduced pretty late in my career; I was 25 years old. I believe citizen science has the capability of shaping and tuning our young minds. The children who go to high school or maybe just graduated, I think for them, it's a plenty of opportunity. I truly believe, I wish that maybe when I was in school, trying to get things done and trying to do something in science, I had something of this sort. It was not there.

Bob

So Sumit, was it difficult to focus on science when you were young?

Sumit

Oh, there was a lot of difficulty, yes. Because resources-wise, I do not have much. I come from a economically backward family. And also I am from India, which is not a central hub for astrophysics as of now; we do have seven engineering projects going on with satellites and communication, but not core astrophysics, as such. So, yes, there was a lot of difficulties. But then citizen science came to my rescue. Because I did not have many research experience, I did not have many papers to be precise, I did not have many internships to be precise, which is exactly what undergraduates do these days. I did not have any of them. I needed something to start up with. And citizen science is something that helped me get into these things, so that is how it helped me.

Bob

But you found it after high school, right? Did someone introduce it to you?

Sumit

It was more of a self-motivation, to speak about, because I am a Master student in Astronomy, and as part of my dissertation, I must contribute in research. And that's how I got into citizen science, because you meet a lot of researchers out there, and that's how I started.

Bob

And what were the first projects you joined?

Sumit

Ah, citizen science, I started off with classifying images. That is how I started. And then I think about 7 to 8 months back, I received an email from one of the researchers. And it happened to be Disk Detective. Which is one of the projects I believe SciStarter has on their website. And I started attending calls– and by the way, the calls are late night in my time, it starts at 1 o'clock in the night, 1 AM, and it goes until 3:15, 3:30 in the morning. So I attend these each week without fail. And slowly and steadily I have been making progress. And now, at present, I do some kind data analysis with them, with the scientific team, and that how exactly it's all about.

Bob

Wow, that is so great. And what are your plans now?

Sumit

The first thing, I would like to have my master's degree. I have just started my master's degree a month back. And post, I will try to get into Stanford. That is my dream college. Getting a PhD from Stanford would be like a dream come true. And that's the big dream. And the long term dream, if you might ask me, maybe in 30 years or 40 years, I think that's pretty much the plan at this moment, but I plan to get a Nobel Prize for my country. So that is how my plans are; let's see what happens. This is just the starting point.

Bob

Wow, I think you would be the first of our volunteers to win a Nobel Prize, so we are going to be rooting for you! Thanks, Sumit, for sharing your story with us.

Sumit

Thank you!

Bob

Citizen science really does open up new possibilities for young people who either find it on their own, like Sumit, or thanks to teachers like Alyssa Reese, and also thanks to the efforts of Girl Scouts, 4H Clubs and other clubs and community groups. We spoke to a Virginia girl scout troop leader about her experiences.

Gail Cook

My name is Gail Cook and I am from Palmyra, VA in Fluvanna County with Girl Scout Troop 1484.

Bob

Thanks for being with us! In your email, you wrote that you and your troop got involved with citizen science through a merit badge. Can you tell us about it?

Gail

Yes, it's called Thinking Like a Citizen Scientist and there's a few things that you gotta do in order to earn it, and one would be to help out a science community doing a science project. So I googled it and came up with the Ant Picnic project. So the girls liked that and we chose that.

Bob

Oh, right! Is that the one where you put different food items out on index cards and see which ones attract the most ants.

Gail

Yes.

Bob

So how did it go? What did the girls think?

Gail

The girls actually loved it. We ended up having to do it twice, cause we did it in April. And of course, the project said don't worry if you don't get any ants, then that's okay, that's just, you put in your data this is what happened. So since we didn't have any ants the first time around, and I had a bigger group of girls in August, on August the 28th, we decided to redo it, and came up with the amino acid attract the most ants.

Bob

Oh, okay. Aamino acids? Where do you get amino acids?

Gail

It's like a powder you can buy in the pharmacy. That you could use for body building...

Bob

Oh, yeah, and they liked that more than like, sugar water?

Gail

Yeah, they did, because they, the girls actually were like, okay, we think that the ants are going to be attracted to the cookie, and maybe the sugar water. But the girls actually looked up on the internet to find out that the amino acid gives the ants the most energy and the most nutrition that they need for a healthy life and carrying things back to the ant hill.

Bob

And your troop's experiment confirmed that. Okay, so now, your girls have done it, and I guess they've gotten their badge. Do you think they'll do more citizen science? Is there interest in it?

Gail

There always is interest. The girls are very into the STEM projects: Science, Technology, Engineering and Mathematics. And I put my girls out there to do anything and everything that I can possibly get them to. Anything science or technology, they definitely are up to doing it.

Bob

Great! Anything else you'd like to share?

Gail

Well, the girls were really excited about doing it. And they were very excited that the data that we collected is going into a website that has more data that's collected elsewhere. And they like the fact that in the data that we put out on the website it actually pinpoints our location, latitude and longitude, location as to where we did it. They thought that this was very cool.

Bob

That's great. Thank you.

Gail

Thank you!

Bob

And finally today, biology professor Thad Yorks is at Cazenovia College in Upstate New York. He introduces his undergraduate students to authentic scientific research by having them collect water quality data for the Clean Water Hub project.

Thad Yorks

So we're an undergraduate institution so it's all, you know, college students working on their bachelor's degree from you know first semester up through, of course, some transfer students that they come in as well. So many of the types of data that we collect, rather than just simply you know, going on a datasheet and then we might play around with those numbers a little bit for purposes of the class assignment, one of the things that some of these databases that are available now allows us to upload those data, take it that next step and make those data available basically forever.

Bob

And I suspect that makes it more engaging for the students, instead of just doing assignments that get stuck in a desk somewhere...

Thad

Yes, yes, exactly, I love it, it's, it's just makes everything that much more exciting and interesting. And you're exactly right, it makes it that much more valuable, that much more real. We're doing real work, not just checking off a box in a course assignment.

Bob

And what projects are you working on?

Thad

So the main stuff that we've actually primarily, uh, stream water quality, stream water quality databases, so through the Izaak Walton League, they've had in place for some time what is called The Clean Water Hub and so we can upload data to that. So it's chemical, some straightforward chemistry, some of the basic parameters that are that are commonly measured. Like the things, if you had to measure one or two things, these are the things you would do, like phosphorus, dissolved oxygen, those kinds of parameters. It also allows us to upload the macroinvertebrates, so we're talking about the insects, and other, you know, crayfish, etc that we find in those streams, using a protocol that Save Our Streams has fine-tuned over literally decades. They just celebrated their 50th anniversary here in the last year or two. So it's a protocol that's tried and true. And so this is a really cool story that you can relate to students, you know, they can understand it. I didn't make this up. I didn't just make it up last year and I'm tweaking it for the first time. These are protocols that have been modified and fine-tuned over a long period of time.

Bob

And in your email, you said that you're also bringing citizen science to the community beyond the college, right?

Thad

Right, yes, and so I've been involved with our local Scout Troop for... 15 years, a long time. The kids came up through there, and we're fortunate that we've got a really tight knit community that really overall is very passionate about, you know, we've got a lake about three blocks from campus in one direction, a trout stream three blocks in the other direction. So there have been efforts to monitor stream water quality and lake water quality for a long time. So being able to get those data out where people can see it, see those data, is really helpful.

Bob

So cool. Anything else you'd like to share?

Thad

So one of the things that you know, with doing some of these kinds of things, not specifically because it's citizen science, but because it is science that has real life application, and students can get enthusiastic about it. You know, we've seen this time and again work in terms of getting developing, getting them lined up for success after graduation, you know, finding that first job as a laboratory technician, which, you know, entry level, but we need people with attention to detail and have some experience, and can see the value in collecting data, not just for collection's sake, but for you know, for going forward, being able to detect any potential changes and hopefully be able to respond to them. Or you know, graduate school, we've had students that have benefited I'm sure by this, in part, collecting data in various waterways around here, so that's something, that's obviously part of the picture: we're going to college to get a career going, not just to get the degree, right? So that works.

Bob

Right, these are skills that are practical and useful for all sort of careers and activities that they might pursue after they graduate. Well, thanks so much for everything you do, and for sharing your story with us.

Thad

Thanks for having me. This is great. Getting the word out and getting more people involved– appreciate that.

Bob

Four different perspectives on citizen science volunteering, through four different projects: iNaturalist, Ant Picnic, Disk Detectives and Clean Water Hub. But all of our guests use citizen science to vault themselves and others into a vibrant community where professional scientists and citizen scientists work together to explore, solve problems and make the world better. I'm Bob Hirshon; thanks for listening.

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