

Jessica Kesler (00:01):

One student at a time, isn't gonna bring a million students through the door. But if we focus on their teachers, then they can implement it in their classroom and have this multiplicative effect that can continue on and help us to reach those millions of kids and helping them be prepared for future careers.

Eric Cross (00:19):

Welcome to science connections. I'm your host. Eric Cross. My guest today is Jessica Kessler. Jessica's director of professional learning at TGR foundation, which is a tiger woods charity. There she creates and leads free stem, professional learning opportunities for educators across the country. Prior to working at TGR, Jessica worked as an elementary, middle and high school science teacher while fulfilling several leadership roles, including science department, chair and principal intern. In this episode, Jessica shares some of her classroom experiences while working in Philadelphia, where she was in classrooms, where her students needed her to be more than just her content. She also addresses how designing professional learning with empathy for teachers in mind creates better experiences for teachers. And now please enjoy my discussion with Jessica Kessler. So let's, let's start off with St. Joseph's chemistry college to the classroom, like your origin story. What led you to ultimately get into the classroom and being successful, even just looking at, at your kinda like your resume or your CV of all of the things that you've done. You definitely weren't idle, but start off with chem. Yeah. Like where did that passion come from?

Jessica Kesler (01:27):

Yeah. So when I was younger, I just had this burning passion to help people. Right. And when you're young and you think about helping people, you think about doctors, doctors help people. Right. So I had this idea that I wanna be a surgeon. I wanna be a black surgeon. I wanna be a young girl, female Charles drew, and I just wanna go out there and do it. And so my mom is actually an alum of St Joe's. So I spent a lot of time on campus cuz as she was getting her mini master's degrees I will visit campus with her often. And so when I applied, I had the scholarships, had everything and I went in ready to be bio ready to be a surgeon. I took my first bio class and I was like, yes, let's talk about the human body. And let's get into dissections and sections. And they were like, okay, so a plant so has this. And I was like, Ooh <laugh> I was like, this is not what I was expecting at all. It just felt so detached from the trajectory that I wanted to take. And it just did not feed that passion of helping people in the immediate moment.

Eric Cross (02:31):

Did it, did it feel too abstract?

Jessica Kesler (02:33):

It felt abstract. It felt boring. Okay. And one thing I didn't want was to be like stuck, bored. Like if I'm not being stimulated in a good way, mm-hmm <affirmative> then it's not gonna last, but I love science. So I

switched over to chemistry cuz I'm like this chemistry is exciting. I'm mixing things together. I'm producing new things. I'm doing extractions. I'm being introduced to machinery that I haven't seen before. I'm loving it. I'm doing a math. The math is awesome. And so I switched over to chem and I started doing research in the summers and things like that. My research was around water quality in Philadelphia and looking at different natural water sources and comparing them and all those great things. But I was in a lab and the lab had no windows and I was stuck talking to this atomic absorption specter every day.

Jessica Kesler (03:24):

And I hit that, that wall again, where it was like, is this the rest of my life? Like talking to these machines and not having windows and not being able to interact with people. What is this? This can't be life. And so I was seeking out some new opportunities that said, Hey, I need more money. First of all. So I'm like, I call the financial aid office like every week, like, Hey, what's out today. What new scholarships do you have? I'm applying for everything. Like it was my goal to not have to pay for much of my education. And so I was talking to them and they're like, Hey, you're in science. There's this awesome opportunity called a noise scholarship where they'll pay for your last year and your master's degree. If you go into education mm-hmm <affirmative> and I sat on it and I was like, this makes so much sense to me.

Jessica Kesler (04:12):

I was like, I've been literally tutoring my peers and teaching in churches and all this other kind of stuff. My whole life. It makes so much sense. How come nobody ever said this before? <Laugh> and so I applied for the noise scholarship, got in and started, you know, mm-hmm, <affirmative> doing practicums in the classroom as I went through my last year as a chemistry major and my first year for my masters and it just felt so right. And I was like, I can do this. And of course there were a lot of people who told me, no, Josh, you can't do that. Like these kids will eat you alive. And I'm like I don't think so. <Laugh> but, but that's give it a go. And I stepped into the classroom and it, it just felt like, felt like it was always meant to be there.

Eric Cross (04:57):

So you were able to, you were able to make that connection between, I mean, if you're, if you're studying chemistry and bio and going into stem, I mean, there's, there's an aptitude there, but then you realize that this there's a road that you could take that leads you into a room with no windows. And you're just hanging out with machines all day

Jessica Kesler (05:14):

And I'm not helping people. Right. Right. And that was, my passion was like, I'm not helping people sitting in this room. I need to be a person that's outside telling people about what happens in the room. Right. And how they can get involved and like what's going on in here. Like that's, that's where I can be useful.

Eric Cross (05:28):

When you were, you were in Philly when you were teaching, what were you teaching when you were there?

Jessica Kesler (05:33):

So I started off teaching eighth grade science first job in north Philadelphia, teaching eighth grade science and just a, a funding tangent that first day a student called me a B

Eric Cross (05:44):

Trial by fire

Jessica Kesler (05:45):

Trial by fire called me out in front of like the whole floor. We were outside doing line drills and just was like, I hate you miss Kusa your B. And I was like, oh, this is it. This is it. This is where you stand your ground and you take it or you, you bail out <laugh> and you go back into the lab mm-hmm <affirmative>. And of course at the end of that, that traumatic experience between all the kids, like two months later, she wanted me to adopt her. So like everything comes full circles. Right.

Eric Cross (06:10):

That's how it is. Right.

Jessica Kesler (06:11):

But I started teaching eighth grade science. There's not a lot of science teachers at that level who actually have a science background. Most of them have elementary school background. So I'm the only scientist walking into the science classroom and saying, this is how science actually works. And so I ended up taking a lot of onus of science while I was there. Ended up building out the K through eight curriculum for science. I ended up doing like a science strategic plan to submit to the district. I ended up leading out our first couple stem nights and like really leading the stem department and kind of our science department. And this was as like a second, third year teacher <laugh> know, but nobody else had the science mm-hmm, <affirmative> the way that I had the science and the education. So it really opened up a door for me to be able to, to run full steam with all those things.

Eric Cross (07:04):

So MI was it primarily middle school during those, those years that you were there?

Jessica Kesler (07:07):

So there, I started with middle school and I did that purposefully because I was still young and I wanted there to be a good age gap between me and the students. And then I moved up to high school and taught high school chemistry, also taught a couple other different subjects while I was at that school. But primarily high school chemistry. Then I actually took a big leap down and I said, okay. I was going for my second master's degree in educational leadership. And I was going for my principal cert. And I said, if I'm gonna be a principal of a school, then I need to understand all the levels of education and how they operate, cuz they operate really differently. So I said, I started in middle school, went to high school. I don't have elementary school experience. In fact, I'd spent a day in a kindergarten classroom and I was like this never again, but I was like, I need to go back down there and I need to figure out how this system works because you know, I never know where I'm gonna land as far as principalship.

Jessica Kesler (08:01):

So I went and taught fourth grade.

Eric Cross (08:03):

How was that experience?

Jessica Kesler (08:05):

So imagine me going from teaching high school, seniors and juniors Uhhuh and like they're self-sufficient and you know, they're independent, they're driving to school and all these things. And then I immediately drop down and go into fourth grade where these kids are crying every five seconds. They still have like a lot of bodily fluids, like there's noses running and things. And like <laugh>, I was like a fish outta water. I was like, what is this? What's going on down here. But those kids pour out so much love. And they, you, you become another parent to them. Mm-Hmm <affirmative> your high schoolers know who their parents are. They kind of are finding their place in society, but the little ones, they only know big people as parents, small people as equal. So they see you as another parent. So it taught me a lot about, you know, patience and breaking information down, even smaller. I had to figure out new and inventive ways to teach science and bring it down so far that they would be able to grab onto it and achieve it. And it was a challenge, but at the end it paid off, we were running, we were hitting like great markers for all of our PSSA goals that year. I mean, we were really knocking it out the park

Eric Cross (09:17):

And this backstory leads into how we met and adds to the picture as to why I really want to have you on, because your involvement with TGR, which is where I want to go next for the folks listening. I bet a lot of them have no idea what it's about, just like I did. And now me learning about TGR foundation and meeting you I would love to make sure that everyone knows about it and what they offer.

Jessica Kesler (09:39):

Absolutely. So TGR foundation, a tiger woods charity was founded by tiger woods and his father with a mission to really introduced them education to students in low income minority populations and prepare them for success in their world and their future careers moving forward. And so was founded in 1996 and went through several changes in iterations since 1996. But eventually opened up its first learning lab, which is in Anaheim, California. And through the learning lab, they opened up these satellite sites. So they basically partner with schools to provide after school education and robotics and wearable electronics and things like that. And they would partner with schools to teach these courses after school, they would pay the teacher, pay for the materials and stuff like that to provide more opportunity for students in different areas. And so that's how I was introduced to the foundation because while I was teaching high school my good friend and previous manager, Jason Porter shout out to JP Jason Porter used to lead the tiger woods foundation when it was the tiger woods foundation.

Jessica Kesler (10:52):

He used to lead the afterschool program. And when I joined that high school, he said, Jess, you got all this great content, knowledge, all this great enthusiasm, and we wanna get more women into this robotics. We wanna get them engaged in this process of, of stuff. And you will be a great role model to start bringing in more of our female students. And I was like, great, sign me up. And that's where I started working with the TGR foundation, right after school programs, getting my students into robotics, competitions and clubs, doing different challenges and design challenges. And then after some time, a few years, they actually needed someone to come to the DC area and support the development of professional learning and partnerships here in DC, as they were continuing to expand. And really it came out of the idea that tiger gave this big mission to the organization that he wanted to reach millions of kids.

Jessica Kesler (11:48):

He said millions and everybody said, what millions, what M <laugh>. So the foundation was like, okay, well we can't reach millions by just tackling one student at a time, right? Not one student at a time, isn't gonna bring a million people or students through the door. But if we focus on their teachers, mm-hmm <affirmative>, then those teachers not only spend most of their day with these students and learn the basics of their skills with these students. But each one of those teachers has 30 to 150 200 students that they see every day. And that's how we multiply this effect. So we train the teachers on all the stem competencies and the pedagogical tools and strategies to implement the stem that we're doing in our learning labs. And then they can implement it in our classroom and have this multiplicative effect that can continue on and help us to reach those millions of kids and helping them be prepared for future careers.

Eric Cross (12:44):

And so D divide the effort, multiply the effects. Exactly. And then when I was exposed to it, this was over zoom. Now, how long has it been going on? Has it always been virtualized or did you do the, were you all doing this before? We all went online

Jessica Kesler (12:57):

Before the pandemic man, the glory days, right before pandemic, it feels like I'm talking about prehistoric times, right? Like back in the dinosaur, like era, like, I don't know, pre we actually did these workshops in a person. So we would invite people to come to DC, invite teachers in Philadelphia to do a Philly one. We were in New Mexico. We were in Florida. We were, I mean, we were everywhere and this would be an extremely hands on engaging workshops. So not only do we focus on this is the theory and the philosophy behind the pedagogy, but we would also focus on like creating a student experience for the teacher, having the teacher flip into student mode and put on that student hat and actually go through sample lessons, model lessons and activities as the student so that they can feel it. So you can feel if, if you feel confused, your students are gonna feel confused.

Jessica Kesler (13:52):

If you feel like this is challenging, you, your students are gonna feel the challenge. If you are, don't understand the instructions, your students will understand the instructions. So it gives us a different perspective and it puts us in their shoes. So we can better empathize with them and create more responsive lesson planning. So we flipped them into that student role for that purpose. When COVID hit, we went virtual, but virtual allowed us to reach teachers that we probably would've never hit. So it was kind of that blessing and disguise, right? It was like we didn't keep people as long cuz obviously virtually you're not, you don't wanna stare at a screen for eight hours. So we cut it down. We revised it a little bit, but we kept the hands on philosophy and feel of it going by, you know, using materials that they could find at home really modeling what education could look like.

Jessica Kesler (14:41):

Mm-Hmm <affirmative> if you used your Z zoom room to capacity, or if you had these materials and resources or rethought your lesson plans and structures. So we went virtual and not only were we able to hit so many more thirst that first year thirsty educators ready to get, dive into it, ready for some comradery with fellow educators. But we were also able to expand our international network. We were able to get so many international educators through our global work that it was, it was beyond what we had when we were in person. So it really had this skyrocketing effect.

Eric Cross (15:20):

There's professional learning pathways and then virtual stem studio. Is that right for professional development for like teachers who are listening, are those the two kind of main prongs?

Jessica Kesler (15:30):

Yeah. So a stem studio is basically just one, right? And a pathway is a collection. So we now offer four stem studios, four separate stem studios. The first one is on inquiry mindset. You attended that one area. And it's really about for teachers who are changing their perspective on what the classroom should look and feel like, especially administrators too. It's about developing that inquiry mindset. So you understand

and you feel, and you practice and you learn the tools that are necessary for inquiry to happen in your classroom. We never promote overhauling your classroom. We're just saying, add a little bit here and there and see how it impacts your students. The second one is on making inquiry, visible, making inquiry visible is all about making students thinking visible in the moment. What are tools and strategies that you use so that students can illuminate their thinking for themselves, but for you and their peers as well and how we benefit from that.

Jessica Kesler (16:28):

So not only do the students get to see their own thinking as they progress and you get to tell the story of how their minds have evolved, but you, as the teacher get to see, oh, this is where everyone is making the mistake, or this is how this misconception came about. Or this is where I need to target for my next lesson. So it makes you more responsive in the moment. And then the third and fourth one where we're actually launching for a small group this summer, it won't be available to the masses until maybe a year or two down the line. We have one small group that we're just going to test it out with. The third one is about developing your inquiry environment. So thinking not just about your physical space, but thinking about your intellectual space too. So what are the things that you can embed into your physical space and develop in a student's intellectual space that will help you create a holistic inquiry environment?

Eric Cross (17:22):

So this is this inquiry space, not just physical, but then also the intellectual environment

Jessica Kesler (17:26):

Intellectual. Exactly. And it focuses in on the design process and how we design spaces. Because as a teacher, we take a lot of background in the background onus of de creating these spaces. If you take someone out of an old habit or space and tell them, oh, we are gonna change in your minds and teach inquiry, but put them back in the same environment, they're gonna be conflicted, right? Their bodies wanna do one thing, their minds wanna do another thing. And they don't know how to bridge the gap between the two. So this is a really illuminating, like how do you change all the spaces? How do you design a flow in space in your classroom and in your students thinking that allows them to be productive in that inquiry environment. It's really good stuff

Eric Cross (18:11):

Who creates these experiences for teachers.

Jessica Kesler (18:14):

We do. So me and my teammate, Holly, Dard shout out HD. Holly Dard, we really put our brains together and developed these. So it's a really a team effort because like Jason Porter, Eric even David Tong when he was with us, really collectively thought about what it is that we wanted educators to experience. And then Holly and I do a lot of the grunt work, but then we really collectively put it all together and make it

what it is. So I have a heavy hand and a lot of that. And in fact, inquiry four is all about the entrepreneurial mindset. So oftentimes educators don't consider themselves entrepreneurs, but if you take a look at what an entrepreneur is and what they do on a regular basis, educators are entrepreneurs, but we are missing an opportunity to use our entrepreneurialship in the classroom to drive for stem competencies in inquiry based practices. And so in, in stem studio, four, we really focus in on how the educator is the entrepreneur of their classroom, but also uses entrepreneurial techniques to tackle issues in their schools, districts, and spheres of influence. So it's really taking the educator to the next level of their teaching practice through entrepreneurship. This is some deep stuff.

Eric Cross (19:37):

It is, well, this entrepreneurial mindset is, is something that I've heard before. And I definitely see the link between even the term teacherpreneur beyond just selling lessons on teachers, pay teachers. <Laugh> it's way bigger than that,

Jessica Kesler (19:52):

Where entrepreneurs actually in the classroom, not just because we do things on the side to make money. Exactly.

Eric Cross (19:57):

A lot of teachers hear that. They're like, yeah, I got, you know, I got, got a few jobs going on. Exactly. Yeah. And, and I think one thing we, I should have said this earlier, and I'll, I'll say the intro, but these are all free.

Jessica Kesler (20:07):

This is largely sponsored by do OD stem as well. So we have a partnership with D O D stem and they have been driving forth the department of defenses, strategic stem plan for years. And as a part of that, they give us funding in order to provide these opportunities for educators for free. So literally educators don't have to come with anything. And we are giving you not only the content of our, our lessons and our instruction, but we're also going give you a chance to earn a free micro credential. So people are spending 12 plus hours with us in a workshop which sounds like a lot of time, but it's over a series of time and days. But we wanna give you something that means something after that, we wanna give you a micro credential to add to your resume, to show your administrator, to show that you have achieved the next level in your professional learning career.

Jessica Kesler (20:59):

Right? And if you finish the pathway, which is all for, then we give you our TGR foundation certificate that says that you've completed so much professional learning in these areas that you are basically a warrior of inquiry that you are ready to go out and really lay inquiry out in new creative ways, not in your CLA just in your classroom, but everywhere you go in your district, in your school. And on top of that, we just

offer so many other great free partnership incentives like discovery, education, experience licenses. We're doing raffles this summer. We're giving out free a free meal voucher so that you can get some lunch. One of these days we're offering \$50 gift cards so that people can get school supplies. So anything you do with us, and you're like, man, I really wish I could have this so that I can do that in my classroom. We wanna break down all the barriers that prevent teachers from doing this stuff in their classroom, actively engaging in this stuff. And we give you a free copy of the books that we reference. Again, trying to break down the barriers,

Eric Cross (22:00):

What are some of the things that you've noticed kind of being on both sides of science teaching in the classroom, and then in training trends with teachers, things like moments that have been great or, or challenges that you're noticing teachers experiencing, especially maybe changes in differences from a, from, you know, an outsider's perspective. Seeing what teachers are experiencing are like, since you've been doing PDs for folks.

Jessica Kesler (22:22):

Yeah. So it's actually really interesting being on both sides of the fence. You know, what I always noticed is that teachers are eager, but they're tired. They're wanting to learn, but they can't take advantage of every opportunity to learn. And especially during COVID time, if you take a look at even all the professional learning that's happening across the world right now, attendance is going down because teachers are so burnt out this hybrid space, this either we're in person, but we're still wearing masks and still social distancing and all this other stuff, or I'm still virtual or I'm virtual some days and I'm in person other days, it's just wearing our teachers out. And I think we notice that as we see a large numbers of friends and family just start to retire, right? Like people are just like, I don't know if I can adapt to another change in education.

Jessica Kesler (23:14):

Like education goes through these waves of big changes and it's hard for everybody to adapt to, but for those who are willing to stick it out and those who are able to stick it out and, and still have that energy and enthusiasm to learn, they come in so hungry for more resources, so hungry to learn more and they still have their why at the top of their minds, as they think about why they do this it's for the kids it's to drive this mission is to get more kids excited about this. And they just come in so passionate. So once they come in, once we can get them to come in they stick with us for a really long time. They're like, what else do you have? What else do you have? What else do you have? But we hear, still hear the common threads of like, do I have time for this?

Jessica Kesler (23:58):

Do I have the funding for this? Do I have the energy for this? Do, will my students understand this? And we are constantly facing that challenge of trying to address those things by, but keeping the excitement

going, like we know you don't have enough time. We're gonna call it out from the start. I know you don't have enough time to try to do 29 extra things. Mm-Hmm <affirmative>. But my advice is always, but do one thing at a time, start with something small, asking your students a few questions rather than lecturing to them. Doesn't take a whole lot of extra time, but it gives you so much extra insight. So let's not work, you know, harder, let's work smarter. Let's embed this into our, our work together. And I always say that we're not asking you to add to your plate. You know, it's not Thanksgiving where you just pile, keep piling on a plate.

Jessica Kesler (24:47):

It's it's a time where you organize the plate. It's allowing inquiry to restructure your plate so that everything has its place and its time mm-hmm <affirmative> do you wanna leave room so that the educator feels comfortable trying some new initiative? That's why we encourage admin. We have librarians attend elementary school teachers, administrators, we, and we encourage it because everyone can support the classroom. And if administrators are more in touch with these new practices and tools and strategies, then they can help facilitate the learning. As the teachers are trying new things and coaching them in specific areas. So we really opened the door for some studios, for any and all who are gonna participate in that child's education, because us all rallying around them as that three-legged stool helps to create that environment and helps support the teacher. The teachers need support, and we're trying to do our part by providing the resources and the tools, but they need everyone else to.

Eric Cross (25:42):

We don't always think about it as a way to support, to get support in our classrooms for ourselves. But I agree with you by, by educating vertically up the chain, you know, vice principal, principal, whoever it is, mm-hmm <affirmative> superintendent getting them on boarding and, and educating them to see what's expected. We'll open up doors and more freedoms for you because now you just have this vertical alignment of folks kind of on the same wave length. Exactly.

Jessica Kesler (26:07):

Yep. And that's why we love districts. Anaheim union school district is actually one of our partners this year, where they have invited their teachers to participate in the whole pathway because they know how important it is that we practice these tools and strategies. And they want as many educators in the same space going through this at the same time as possible so that we can support each other through it. And so that we don't feel like islands, oftentimes as educators, we feel like islands we're in our classroom day in and day out. And we don't feel like there's anybody else who's doing the same things we're doing and supporting the work that we're doing. So when we get administrators who support it, it's magical. It can be magical.

Eric Cross (26:47):

What are some opportunities that are coming up if somebody's listening and they, they wanna sign up for something, are there things coming up this month or next month or in the summer that they can participate in?

Jessica Kesler (26:55):

Yeah, for sure. So we've been doing our monthly workshops. And if you go to our website, so if you actually go to [TGR foundation.org](http://TGRfoundation.org) and slash stem studio you'll actually see our summer events already posted, already live for everybody to start engaging in. And again, everything is free. So registration is open and available for everybody to participate. We are offering that first inquiry stem studio inquiry mindset twice the week of June 21st and the week of June 28th, two opportunities for educators to join us for inquiry mindset for the first one. And then also in July, we're offering the second one making inquiry visible, and that's the week of July 12th. So again, all free stuff, raffle prizes are available for those who register early and get in there and reserve their seat. It is limited seating. And so, yeah, a bunch of opportunities coming up this summer and guess what all you have to do is sign up and then you get all these free things coming your way. You get to look forward to all this exciting stuff. So [TGR foundation.org/studio](http://TGRfoundation.org/studio).

Eric Cross (28:01):

And if folks wanna follow you in your career, your journey.

Jessica Kesler (28:05):

Yeah. I'm on Twitter and LinkedIn, for sure. And it's Jessica Kessler, K E S L E R one S

Eric Cross (28:12):

I wanna honor your time. And as we close, you've been an educator of impact in, in your own classroom. And I know you're still teaching actively now, and you've also made an impact on me and other educators through your professional development. And, and the last question I'd like to end with is who's the most memorable teacher or learning experience that you had during K eight. When you think about you, your time in school, who was a memorable teacher or a moment that kind of stands out to you and what was it that they did that made them memorable?

Jessica Kesler (28:44):

It was that one teacher who brought me my first TI, 84. You remember when a new calculators came out, I had a teacher give me one amazing, but I think in high school, there was really a turn about where I had miss Caroline and Mr. Canello math and Spanish teacher. So two opposite wings of the, the education spectrum there. But most of all, they listened. They listened to me. I felt seen with those teachers, they supported me. They listened to me, they saw my potential. And they just rallied around me and continued to support me thereafter. Even afterwards, I continued to reach out to those educators. And I think that's what drives me to be that force for, for my students. And I remember my

most memorable heart touching education experience was probably, I had a high school student get interviewed by the newspaper.

Jessica Kesler (29:38):

And they were like, oh, what's your favorite classes? And what's your favorite this, and what's your favorite of that? And he was like, well, I love chemistry, which is what I was teaching. It was like, and I love my after school robotics team. I was leading and I love this and this and this. And he basically listed all the stuff that I was doing that I was teaching and that I was leading in the school. And I was like this one student, literally out of all the classes and experiences he's experiencing is really just calling out everything that I'm doing. And I feel like it's because he felt seen, he felt heard. He was like, this person is listening to me. And no matter what space we're in this teacher is, is there for me. And so I try to be that wherever I go, <laugh>,

Eric Cross (30:16):

It's amazing how making someone feel seen and, and making them feel important and heard, and, and being present for them. All of a sudden opens up their interests into the subjects that you're teaching. Thank you for, for making time for serving our kids for serving teachers during a hard time, and for making PD one, being part of an organization that made it free and serve teachers, but also making PD fun and enthusiastic. I think that was one of the things in addition to the empathy that you led with, but also your enthusiasm and passion was something that really resonated with me. And it made our time together. Feel like something that was, was making me a better teacher for my kids. And so, thanks for making time for us tonight. Oh,

Jessica Kesler (30:53):

Bless face.

Eric Cross (30:57):

Thanks so much for joining me and Jessica today. If you have any great lessons or ways that you connect with students, please email us@stemamplify.com. That's S TM amplify.com. And please remember to support the podcast by clicking subscribe, wherever you listen to podcasts, you can also hear more about the podcast in our Facebook group, science connections, the community until next time.