Ricky Mason (00:00):

I feel like comfort is where dreams go to die. And I'm still dreaming every night. So I'll wake up, chasing them.

Eric Cross (00:08):

Welcome to Science Connections. I'm your host, Eric Cross. My guest today is Ricky Mason. Ricky is an engineer whose career included lead roles at the Department of Defense, NASA, and the CIA. Ricky transitioned to education as an adjunct faculty at the University of Kentucky. And while there, he founded BrainSTEM, an edtech company that developed a 3D virtual reality metaverse for STEM education. Today, BrainSTEM serves public school districts, private schools, and nonprofits. And in this episode, we discuss what led Ricky to creating BrainSTEM Metaversity, and how he's using the metaverse to transform STEM learning for students. And now please enjoy my conversation with Ricky Mason. How did you, so like maybe going back doing your origin story, maybe you can talk about it, but brother, you don't sleep. Talk about keep making moves, your hashtag, I mean, I was looking at your LinkedIn profiles, looking at your details. You get after it. I was getting tired just reading it. I was like John Hopkins, electrical engineering, real estate, starting companies. You must have that gene where it's like four hours of sleep and then you're like, ready to go.

Ricky Mason (01:19):

Yeah, man. My mom told me if I didn't stay busy, then I'm in trouble. So when I was about 14, she told me that. I said, well, Mama, I guess I'm gonna stay busy then. And yeah, man, that's just been my life. I feel like if I don't keep making moves, then I'm in trouble. So, feel like comfort is where dreams go to die and I'm still dreaming every night. So I'll wake up chasing them.

Eric Cross (01:44):

I feel like a kindred spirit with you. So, were you always interested in STEM like, was there something like a moment or a year where you remember you were like, this is my jam. This is what I'm gonna get into.

Ricky Mason (01:57):

Yeah, man. When it really clicked for me was in the fifth grade. I was at a school assembly and an IBM engineer came in and he brought a robot and he programmed it with punch cards right on the stage. And I got the opportunity to come up andyou know, put one of the punch cards in the robot to program it. And I asked him, I'm like, what is your job? He said, I'm a robotics engineer. And I went home right after that assembly and I said, Mom, that's what I wanna do, become a robotics engineer. And my mom would take me to the libraries. Well, I felt like I was getting outta bible study on Wednesdays by going to the library. So I went there and I started researching robots.

Ricky Mason (02:39):

And at the time the robots that were popular were all being sent to space. And it was the spiritless. It was being sent to Mars. And I said, Mom, well, I guess I gotta become an astronaut if I'm gonna be a robotics engineer. And that's kind of what set me out on that dream. And my mom started trying to find outlets for me to get involved in STEM, but it was really tough to find those outlets, you know, especially in that fifth to eighth grade range here in Kentucky. So that was kind of where it started for me man, when I knew that yeah, engineering is what I wanna do.

Eric Cross (03:14):

What does an electrical engineer do? I imagine there's different types of specialties, but like, was there something that you specialize in that you focused on or was it, is it just kind of like a generalist field?

Ricky Mason (03:23):

Yeah, so I would say, yeah, man, it's a huge field. So you could be doing anything from, you know, power, like power coming into your house. So those large power systems all the way down to nanotechnology and microchips. I like to tell people I'm a real full stack engineer, so my wheelhouse is kind of from the PCD, the little green computer chips, all the way to the cloud. Over my career, I've had some pretty cool jobs. One of those things was I was a test engineer for the army. So I got to test weapons up at Aberdeen Proving Ground for the Army. So I got to drive those weapons and test them before they went to theater there. After that,I worked at United Launch Alliance down at Cape Canaveral where I launched five rockets.

Ricky Mason (04:07):

So I was a part of the electrical ground systems team there where we were responsible for all of the electrical systems on the rocket while it was on the pad. Somonitoring the temperature of the rocket, the fuel, the entire system for safety while it was on that pad. And then finally I worked at the CIA as a computer engineer building data centers and as a data center architect for some of our remote systems and virtualizing our systems. So kind of had a broad spectrum of things there. And then finally coming back to the University of Kentucky as a research engineer and faculty. I developed drone technology for monitoring crops. So flying drones over crops with LIDAR, just like self-driving cars with high-definition cameras to pull in data about those crops, to help farmers determine about pesticides fertilizers, and the overall health of their crops from a remote location.

Eric Cross (05:10):

It's so neat to hear you talk about it and to see how this is all built up to what you do now with BrainSTEM. How would you explain what BrainSTEM is? I know that's your, that's kind of your baby right now and what you've been working on a few years.

Ricky Mason (05:23):

Yeah, man, we started BrainSTEM in 2019 officially, but I would say BrainSTEM has been almost 10 years in coming. While I was in undergrad, I played football at the University of Kentucky. But I got hurt going into my sophomore year and that kind of shattered my dreams of football. And that's when I really got back into engineering. One of my professors asked me to come to a robotics competition and I saw these third graders and sixth graders programming robots. And I'm like, oh my God, they're programming robots! And I had no idea how to code or what to do with these things. And where was this a when I was a kid? And so I immediately bought one of those robots and taught myself how to program it <laugh> and then we started a robotics team in Lexington,there at a church.

Ricky Mason (06:10):

And we got a sponsorship from Lexmark to start that team. And that was kind of my first leap into STEM and teaching STEM and creating programs for students in STEM. I did that in undergrad and like I said, fast forward 10 years later, I'm teaching at the University of Kentucky and we're struggling to recruit STEM students. Why aren't students going into STEM? I hear too many adults tell me, oh man, I wish I would've done engineering, or I started out in engineering, but I left engineering or I wish I could go back to school for engineering or learn to code. And I'm like, I asked them like, why didn't you do this? What happened? And often it's like, it was the math. It was, oh, I didn't get into it until I was in college. And I'm like, well, that's the key.

Ricky Mason (06:52):

I knew I wanted to do this in the fifth grade. And I started with a plan in the fifth grade to achieve these goals and dreams. And I started doing that research and realizing that the same problem existed that I had. There was no outlet for kids to get involved in STEM, and so many kids have an affinity for STEM an early age. So we started BrainSTEM to provide access to STEM education and exposure STEM careers, STEM professionals, and just to STEM fields as a whole, because too often kids may know about the term, engineer, or the term, scientists, but they don't really know what those people do or have a strong connection with the field or have any hands-on projects that they kind of done around those things or met anyone like me.

Ricky Mason (07:42):

I didn't meet an engineer until I was in college. So that has really been impactful for some of the students that we've been able to touch. I had a family reach out to me. They moved to Lexington from California and they were like, man, I really want my ninth-grade son to get involved in engineering. So we started a weekend program with that one student and it went amazing. Like we competed in science fairs, we applied for different college programs and things like that. So it became an entire like mentorship program. And I'm proud to say that a year ago, he actually graduated with his bachelor's in electrical engineering from your side of town, UCSB. It was just awesome to actually see this come full circle. And that's kind of one of the first things that we did before we actually formalized as BrainSTEM University.

Eric Cross (08:34):

What will be like your elevator pitch for a teacher? If you were gonna say, this is what BrainSTEM does. I have the luxury of going through it on the site, but since we're on a podcast, how would you kind of pitch it to people letting them know, like what, what does it do? Who does it serve?

Ricky Mason (08:47):

Yeah. So BrainSTEM provides STEM curriculum and STEM magnets for schools and nonprofits looking to increase access to STEM for K through 12 students. We also have launched our BrainSTEM Metaversity, a metaverse product for teachers to take their 2D Google classroom and convert it into a 3D metaverse classroom where students can collaborate during a 3D class. So all of your students show up as their avatars that they can select from our inventory of 150 avatars, and enjoy class in a 3D gameified Minecraft like World.

Eric Cross (09:26):

So I made my avatar by the way. It's kind of tight, I have to say, it's kind of tight. Hey, I'm gonna share. So those of you in the podcasts I'll share it so you can see it. You're not gonna be able to see it right now, but since I have the man himself I gotta share it with him just so I can get a reaction. So can you see that?

Ricky Mason (09:43):

Yeah. <laugh> That's so good.

Eric Cross (09:44):

I feel like I wanna look like him though. I want him in real life. Like I want be able to switch to looking like my avatar

Ricky Mason (09:52):

<Laugh>

Eric Cross (09:54):

That was the first thing that I jumped on, when I went on your site, was making the avatar and I had so much fun doing it. I actually took longer than I probably wanna admit cause I was like customizing everything

Ricky Mason (10:03):

Yeah, man. It's so fun. And that's exactly what, you know, when you can show up as the person you want, it changes your whole being. I've seen kids that are quiet in class. They show up as their avatar and

they're talkative, they're asking questions, they're moving around the room, interacting with other kids. I feel like it's almost like a superpower just to put your avatar on.

Eric Cross (10:25):

So what is something that a teacher could have their students go and learn or do if they, if they signed up,

Ricky Mason (10:31):

Let's kick it off. So how we started with the metaverses, was teaching coding. So our first class was Minecraft and Python coding in the metaverse. So students showed up in the metaverse with our virtual instructor, that instructor led a lecture in the metaverse and then those students could collaborate on their Python games. So, they created and built the game in Python. We shared those games in the metaverse and we have our leaderboards that are in the metaverse, as they're completing these challenges, including these games, then sharing them back in the metaverse with other students and getting that feedback on their game. So we've seen huge excitement from students when I can come back in and see my friend's work. Like too often, students don't get to see their work and that's motivation to do better when I'm like, Jim's gonna see my work. It's amazing to see that motivation when students are sharing their work with other kids and not just their parent or just them and the teacher or seeing their grades. It's been really cool to see.

Eric Cross (11:33):

You have that genuine audience too. Like that real-time feedback. And then like an authentic audience for students that makes everything seem, it takes it up a notch.

Ricky Mason (11:42):

Yeah, man. And then as we have built on this platform, so like you said with that avatar, so think if you created a really cool looking avatar and other students wanted to be that avatar, we have a way of sharing that avatar back into the world and in the inventory so that other students could then be your avatar. Or, if you create a world, we could then share that world back into the inventory, so the teacher could have class in a world that you created.

Eric Cross (12:07):

They're creating content, not just consuming it. They're actually creating content that could be shared across like grade levels or students.

Ricky Mason (12:14):

Well, we're gonna say right now it's just within your classroom. Eventually yes, we want students to be able to share that across school districts. At least we think that data will be probably limited to those

kinds of realms as far as schools go. But you'll be able to share this across sixth grade. We'll be able to see what everyone in the sixth grade is doing in their STEM class or their game development class or their history class, per se, even if they're giving back a presentation or what we have here in JCPS is backpack skills of success, where students are presenting on things that they're learning that relate back to core competencies that the district is focused on. And I think that sharing those in the metaverse and doing those in the 3D world will be an awesome experience for students.

Eric Cross (12:56):

Are you seeing anything else as far as those skills that we see that are needed in coding? Is there something that the VR adds that was distinct from maybe just a kid with a Chromebook in his class that it's just him in isolation doing the coding? Was there any like aha moments or surprises when they're in the VR world doing this?

Ricky Mason (13:13):

I think the biggest thing is we could actually show them real examples of code working in other ways. Sofor example, if we're working through loops, we can show them something looping. We can relate these functions to real-world things happening in the VR world so that they can see and better relate the actual concept with visuals, if that makes sense. So, you're in loop Allen the whole time you're learning about loops. You're immersed in that kind of world. What we've seen is students really start to, you know, they it pick up and it clicks a lot faster because some of these concepts are so abstract for students to understand, when we can relate them to things in that world that they see that are in front of them, that they can grasp before we go to okay, type in "while" ""parentheses" <laugh> they can thenrelate that and pick up on those clues a lot better after they've seen those things in the world.

Eric Cross (14:09):

So they can actually visualize it in the metaverse. Whereas outside of it, it's more just, just text-based coding and they're not isolated. Like the first thing I'm thinking about is how like, with my own students, when they're learning Sratch or Python, it's not easy to share back and forth because they all are on individual accounts and they'd have to go on a different computer, or we'd have to find some way to publish it. And then all the kids would have to access it. But it sounds like in the metaversity classrooms, it's easy for students in that same class to see each other's work. Am I getting that right?

Ricky Mason (14:37):

Yeah. So most of our classrooms are limited to 24 students and in some of our breakout classrooms, we limit them to about eight students. Everybody can share their screen, so students can share their screen in the metaverse. They can share their video in the metaverse. They can share documents in the metaverse. They can share their, like I said, their code or anything that they want to share with other students. They can kind of do that. So it's been a really cool product, I think, for students to almost find independence to work within a group, in an online setting. As they've been working through these

problems online and remote it's been really cool to see how they use the metaverse and break out. Even in a class, they can go off into a section because it's all spacial. If you walk away, I can't hear your conversation. So they can go into a little section within a metaverse class and have their own breakout. And a teacher can walk over to them. Okay. You guys are working over here. Let me walk to my next group. Just like in class. So it's been really cool to see those students use the metaverse like that.

Eric Cross (15:41):

Just listening to you talk about this. One of the exciting things about emerging technologies or taking what the private sector does, and someone with a mind like yourself, and go, how do I use this for education? Like, that's something that like excites me and you've run with it. But I just thought about, you're doing an hour of code, you've created this metaverse, and you can bring in somebody, a professional into the metaverse, but they're in, you know, the Bay area, but they could be a software engineer for Tesla or Google or anybody. Could they move around the metaverse and take a look at different students' work and interact in that way.

Ricky Mason (16:17):

Yeah, man, we get in there. We make metaverse selfies. I drop Lambos in the metaverse, we take picture with Lambos. We have scavenger hunts in the metaverse. It's a really awesome experience. And that's one of the big things I think that is so powerful, is like you said, we could have that engineer, that celebrity, we could have Travis Scott, you know, in the world meeting thousands of kids motivating them because they met their STEM goals. They met their, you know, their testing school goals or whatever. These are things that kids really care about. If I get the Travis Scott avatar or the Elon Musk avatar, because I completed the Elon Musk rocket challenge, like that's huge for me to show up in class as that avatar, like it's just like Fortnite and it's bringing all of those mechanics into the classroom.

Eric Cross (17:07):

When I hear you talk about the metaverse and I hear you talk about the potential of where you want to go with it, I think about my own students, and I think about, how they would really have a genuine interest and desire to want to do this and probably be doing it when they don't have to, like at home at night wanting to go back into it and interact. And, you're also building this virtual community. I mean, are you seeing that like, cause I'm hearing that?

Ricky Mason (17:28):

Yeah, man, building that community is huge. And I often tell people all the time, I want the STEM community to be just like the basketball community, the football community. I want students to have that camaraderie built around them for learning STEM and participating in STEM activities and competitions. Because when you see students out there at a robotics, they have the same zeal, the same, you know, everything that you find at a football competition. So we just have to get behind them and back those events with the same enthusiasm that we back sports. And that's the environment that I

want to create for STEM students and for that STEM community, because I longed for that community when I was in school. And like I said, I had it in football, but I wanted both. I wanted the best of both worlds. I wanted my robotics guys and my football guys to show up together here at the competition and have a good time.

Eric Cross (18:23):

You're absolutely right. Like robotics STEM, these things, community helps fuel like people's interest and working together. And it brings people from the outside who are seeking that community. Like, hey, my friends are doing this, I wanna kind of check it out. That's how we recruit a wider swath of our population into it. So it's not this kind of very narrow channel of folks who are going into STEM.

Ricky Mason (18:45):

If you can't find that community. I mean for me, I felt like I was the only one playing football who was interested in robotics. So I never told anybody because I didn't feel like that related to anybody within my vicinity. So I kept that to myself and that's the biggest thing. I think if we get these kids just talking more about their interests, because a lot of them are interested in robotics and space and these STEM topics, but they don't have anyone that's really nudging them or asking them or piquing their interest in those spaces and saying, hey man, it's okay to, you know, learn about robots. It's okay to geek out on space. <Laugh> So that's been my goal and that's kind of why I felt like this was the time in my career for me to kind of do this, be a face for STEM education and inspire kids to chase their goals and dreams. Over my career, I've had some really cool jobs, but I felt like I could keep doing cool jobs, but I'm like at the right age to still connect with those students and inspire them to chase their dreams. And that's why I feel like right now, man, it's just an opportune time to get these students involved in STEM.

Eric Cross (20:01):

We don't get that. Oftentimes, when we're solely doing the cool job or simply in the private sector, we don't get those experiences as much as we do when we're able to actually serve our community or students or take our passion, our skill set, and use it to serve another person. I hear that like, as you describe what you're doing now is like, there's something beyond just, you know, the using your skills and doing cool stuff, but there's something I hear. That's helping people and actually doing something you believe in that resonates deeply in you. And I can hear it as you talk about it.

Ricky Mason (20:30):

It's been just amazing to actually chart out that journey. Like I said, and like tell kids, like, no man, I'm from right up the block from you, cause I mean, I'm building this back at home in my hometown. And that's the reason why I kind of came back to kind of do that in my hometown, because I really want to, you know, relate to those students and inspire, you know, students here. Nobody thinks about technology coming out of Kentucky and that's been a gift and a curse, I guess, with launching BrainSTEM in Kentucky. When I first started, I said, we're a STEM education company, people are asking me what is

STEM? So, that was where we started out with this in 2019, all the way to, you know, hey, in 2020, we're gonna launch a metaverse. A metaverse! What is that? It's been amazing to try to change the minds of not only Kentuckians about STEM and the importance of STEM, but the world that a metaverse company is coming outta Kentucky. <Laugh>

Eric Cross (21:31):

The work that you're doing and, it exists beyond you and you probably know this, but as a Black science educator out here in San Diego ... We don't see people who look like all of us in this work often, and I saw that you had created something, a network group, network and chill. And that was one of the things, we had touched on community, but I thought that that was so huge because we need each other.

Ricky Mason (21:55):

I feel like that was the biggest thing for us in engineering. Like I showed up to my first internship and I'm like, I mean, my boss was cool. Everything else was cool, but I just didn't feel like, hey, this is a community for me. And I almost changed my major because of that. But I'm glad that I didn't, it's huge to have more of us represented in, in these spaces.

Eric Cross (22:16):

And you know, in engineering, especially when we look at the disproportionate, you know, men versus women. Like it's not, you know, it's not just culture, but it's, you know, gender, all of these different things. And if we're gonna change it, I think a program like yours that gets exposure to all kids and then giving them choice. What advice would you give to students? Or what advice I should say, do you give to students now? When you see like your younger self in the different kind of K12 grades who are thinking about their futures or they're thinking about STEM, what do you say to them?

Ricky Mason (22:46):

So my biggest advice, man is start now. Whatever that big thing is, that big dream is that you have, what is that now? You're thinking about planes. You're thinking about robots. You're thinking about RC cars, whatever that is. Let's start now. Let's get your hands on an RC car. Let's take it apart. Let's start coding. Let's start thinking about those problems now. But the biggest thing is, is getting kids used to solving tough problems. Typically, most students that have an affinity for, you know, STEM -- and you just know that that kid's gonna go into, STEM -- they're problem solvers. They're typically looking and seeking those tough problems and seeking opportunities to learn. That's where I feel like it's parents' jobs to provide that environment to foster, that zeal. A five-year-old kid, we started our STEM program with them at the beginning of this month.

Ricky Mason (23:39):

The first day I came in after I told him I was a rocket scientist. And now he's like, well, I wanna be a pilot. I said, if you pay attention to this class, we're gonna get you started on your way to being a pilot. And he

knows all the parts of a rocket and he knows a rocket needs an oxidizer. And he knows the fuselage, the wings, the wing flaps. He knows all the different parts of the plane and how the forces, the drag, the lift, the weight, he knows how those are working cause we talked about those in class and he has so much more confidence and it came all to fruition when a kid said, wow, I thought it was gonna be really hard to be a robotics engineer. And I'm like, no, that's not gonna be that hard. That is exactly what we set out to do when we started BrainSTEM, was to break down those barriers and those walls and build that confidence and say, look man, you can do this. It's easy.

Eric Cross (24:26):

Society doesn't help much either because one of our terms, right, if something's really hard, or if something's not hard, we say it's not rocket science. That implies that rocket science is really hard and inaccessible. If kids would hear that it kind of instills in their brain, okay. It's really hard, it's probably too hard for me. To that point to parents, it sounds like a lot of just exposure, like giving students the opportunity to be able to be exposed to these things and letting them create wonder from it.

Ricky Mason (24:51):

Yeah, man. I often tell parents we're gonna set kids up to go pro no matter what,

Eric Cross (24:56):

And those skill sets transfer, whether they decide to go into coding or they decide to manage a bank, you're still gonna be dealing with people. You're still gonna be problem-solving. You're still gonna have to come up with creative solutions to things. It sounds like through a program like this, they learn those skills early.

Ricky Mason (25:12):

Yes. And I think that one thing that parents don't think about ... We talk about all the STEM and we want smart kids, but we need those soft skills also within STEM. So those competitions, getting them involved in those communities with STEM students is really huge in presenting their ideas because oftentimes, you know, our STEM guys, we're in a lab working and that's where we love and that's where we wanna be because we haven't, you know, been prepared to talk and present our ideas. So I think that's a huge part of what we have to teach our STEM students. And we do that by providing that community and those opportunities for them to, you know, do that.

Eric Cross (25:47):

Thinking about where you are now, looking back on your K-12 education, were there any teachers that stood out to you or that inspired you as I even just say that, can you think of a particular teacher or one or two?

Ricky Mason (26:00):

When I think about my teachers, my teachers really taught me to solve those tough problems and those subjects that you don't kinda like <laugh>, cause I was always a great student, but my teachers helped me to focus on those subjects that I didn't so much, you know, enjoy. So I enjoyed math and science, but English social studies, like why do I have to be here? I had two teachers during my high school career that really supported me in that regard, and helping me to be the best student all aroundfrom like I said, STEM to English and social studies, and making me realize that I have to be a well-rounded student if I'm gonna be truly successful. As far as engineering, man, I would say one guy, my teacher, Nick Bazar up at John Hopkins. During my master's there, I had a really cool project. I got to do data forensics on a real live murder case. <Laugh> That was really inspiring because I'm like, wow, this is real life where my coding skills are being used in a jury trial <laugh>. And so that was a really cool experience to partner with my professor to kind of do that. I mean, that was just mind blowing that I got to help with that and that, I mean, he was using his programming skills to help solve a murder case.

Eric Cross (27:22):

What's the best way for people to connect with you and follow your journey? And if a teacher's interested and they're listening to this and they're hearing, okay, this metaverse coding thing sounds awesome, I want to get involved, I wanna know more, where can people go? What steps should they take to be able to get connected to you and what you're doing?

Ricky Mason (27:40):

Yeah. So you can check us out at brainSTEMu.com, that's brainSTEM, the letter "u" dot com and on all social medias, we're BrainSTEMu or BrainSTEM University. Teachers, right now, we are doing our free course for teachers. So sign up at brainstemu.com. You can sign up for your class to get into a free metaverse experience, just so you can kind of check it out and get your class into the metaverse and see how your students like the metaverse, how you like teaching in the metaverse and convert one of your 2D lessons from Google classroom into a metaverse classroom. For me, I'm Ricky Mason, 5 0 2 on all social media platforms. So you can just type that in Ricky Mason502 and get with me there.

Eric Cross (28:28):

Nice. Well Ricky, I wanna thank you for sharing your story and creating BrainSTEM. And then for, I know you're a man of tremendous talents and skills and accomplishments, and you're focusing all that on not only being back in your community, but also creating something for younger versions of you and opening up opportunities that they might not otherwise have, as you said, folks are like, what is STEM? And that is exactly where we need those seeds planted. So thank you for doing that.

Ricky Mason (28:55):

Oh man, this is awesome. I appreciate you, man for hosting this podcast and providing this platform and sharing the message of, you know, educators and people in the space.

Eric Cross (29:07):

Thanks so much for joining me and Ricky today. Make sure to support Science Connections by subscribing wherever you listen to podcasts. And you could hear more from Ricky in our Facebook group, Science Connections the community, where you can check out all the exclusive content. Until next time.