

**Sue Nelson**

Hello, I'm Sue Nelson and welcome to the Create the Future podcast, brought to you by the Queen Elizabeth Prize for Engineering. Celebrating engineering visionaries and inspiring creative minds.

[Music]

Science, technology, engineering and maths is often shortened to STEM. But there's another acronym becoming popular, which includes art known as STEAM. And today's guest definitely puts the A into STEM, not only to make plenty of STEAM, but also to explain how it's produced, and demonstrate, perhaps on TV, how it can be used as a powerful force for good, not least encouraging a generation of young engineers. Kari Byron is best known as one of the presenters on the series Mythbusters, which showcase the enthusiasm and creativity of engineering just about anything for the sake of it. Kari is also the author of Crash Test Girl, and has hosted a range of TV programmes, including Thrill Factor on the science and engineering of rollercoaster rides. She's also worked at the special effects company M5 Industries in San Francisco, and has been Chief Creative Officer of Smart Girls, a toy company, which manufactures self-balancing robots and action dolls, and helps Girls to code. Our conversation began with how she spent her childhood.

**Kari Byron**

I was absolutely a maker kid, I was a latchkey kid, which means I came home by myself, and babysat myself after school. So, I would find anything I could to craft, especially around Halloween time, I used to love to build sets and booby traps that if you'd open a gate, a ghost would come up at you or sewing dolls out of old pantyhose, anything I could find. Basically, my recycling bin was more of a bin of materials.

**Sue Nelson**

More of an opportunity.

**Kari Byron**

Yeah.

**Sue Nelson**

And so, when you went to further education, this sounds like art was definitely calling you?

**Kari Byron**

Art, but specifically three-dimensional art. I love sculpture. I wanted to figure out how I could be an artist, but at the same time still not be a starving artist. And I was fascinated with the monster making movies, I think it was making of Thriller. That was the first thing that really got me when I saw how they made all those monster faces and how the blood squibs would squirt. And I started watching all the end credit kind of things for like, the making of Star Wars, anything where they show how they build stuff was so exciting to me. So, I when I went to school for college, they clearly don't have a special effects major. So, I ended up kind of making my own major in film studies, art, and strangely enough minoring in political science.

**Sue Nelson**

That is an interesting combination.

**Kari Byron**

Well, you know, I had a fall back, maybe I could be a lawyer if this like special effects thing didn't turn out.

**Sue Nelson**

And did you go directly from college to M5 Industries as an intern?

**Kari Byron**

Oh, goodness, no. When I graduated from college, I took the backpacking route, just seeking out adventure. And it was really even a better education than college was I think I just I met so many people doing such interesting things and got such a global perspective. It kind of dictated how my career is going now, really. So after trying out several different temp jobs while trying to create a resume, that's when a friend of mine told me about M5 Industries and Jamie.

**Sue Nelson**

So, he's one of the original hosts of Mythbusters?

**Kari Byron**

Yes, he's kind of known for giving everybody their first job in the industry, just like really efficient, quick, dirty, fast builds that were also workable. He just got it done. And I went in and asked if I could work for free and he said yes.

**Sue Nelson**

It's a very tempting offer, isn't it when somebody says that.

**Kari Byron**

Oh, yeah, I just wanted to learn. I kind of faked my way, fibbed a little bit with my experience on all the tools that were in the shop, but soon learned very, very quickly how to use them. And my first day as an intern was the first day Mythbusters was filming, so it was kind of an accident that I ran into this course.

**Sue Nelson**

And what sort of things with this sculpting background and you knew you wanted to work in special effects, what particular aspects of the show then did you begin working on?

**Kari Byron**

Well, it's kind of an all hands-on deck show. So, when I started, they hired me as a builder, a background builders. So, anything that they came up with, we had to figure out how to build, sometimes you'd have to even create your own tools, because we were building something that didn't exist yet. I would say that the engineering was a little guerrilla engineering, because we would have to make a face slapping machine. So, we had to figure out how to make a quick release system with a rubber hand at the end that would consistently slap us across the face. So, we'd all kind of divide up the tasks and I would do something like go make a mould of the hand and figure out how to put that around a metal bar that would not actually injure us when it was slapping us and, you know, of course, the test dummies were generally, us. So, you end up with red cheeks after a little engineering.

**Sue Nelson**

Because of your practical love of making things and the crafting and the attention to detail, did you find that other aspect of it, of making tools and devising experiments, relatively a sort of natural progression from what you could do anyway?

**Kari Byron**

Absolutely. It was just fun. I was very curious. And it was really exciting to come up with ways of doing things, you know, "oh, we need to twist wire that can reach all the way across the room? Okay, well, let's put it in a drill. and we'll put the drill over here and we'll spin all the wire and make it stronger" Just, you know, coming up with

new ways of doing things where it was really exciting and fun. I think fostering a sense of curiosity, which is, what artists do anyway, was a really easy transition to science and engineering.

**Sue Nelson**

Now, it's primarily thought that it helped inspire this generation of engineers and scientists. With your arts background, do you think that it also made people think, perhaps with a background that wasn't in science and engineering, "oh, that would be really fun to make"?

**Kari Byron**

I'll be honest with you, nobody on the show had a background in science, the closest we had was Grant, who came into the show later, had an electrical engineering background but the thing that we had in common was that special effects kind of mentality is just to build things quickly and be very creative. So, I think the fact that we all had very creative backgrounds is what made the show work. It just happens that the scientific method is the perfect narrative vehicle for busting myths. We didn't set out to be an educational show, it was just this amazing by-product of the show that all of a sudden teachers and parents were contacting us saying that it was being used in classrooms. And that impact didn't really come till a few years later. And it was very humbling to see the effect the show had, because we were just having fun, and using science like a tool. So, the fact that it inspired people to go into careers in engineering, biotech, science, or even the arts, I feel very honoured to have been a part of their lives in any special way like that.

**Sue Nelson**

Which then of the devices taught to you the most, it could be in any area, it could be that it taught you never to do it again, or that "Wow, that is so cool and I really enjoyed doing that"?

**Kari Byron**

Well for one, I learned the power of duct tape. You think that something's being held together with everything you've done, but nope, you can just put duct tape around it. I find that the most useful tool in the shop. Every rig we built was so different and so complicated and so strange that I feel like I learned something every day that I went into work, which is why we always looked so excited and inspired. Because, you know, one day you have to figure out how to create a movie magic decapitating hat that you see in a kung fu movie. So, you have to see if you can engineer a hat that will fall around someone's head, cut off their head and leave it in a bag. Now, imagine that's your Monday, that is wild, wild stuff. You'd spend the day just running around looking for different things in the shop that could be transformed and kitbashed into something else.

**Sue Nelson**

Now not all of those experiments will have worked, which are the ones that you actually did where that failure was a huge learning curve?

**Kari Byron**

Oh, we had a lot, but one [laughs] we were trying to bifurcate a boat. We spent days and days and days on a runway trying to split this boat in half. And when we couldn't do it, we thought, "okay, just for fun", and we didn't really plan this well, we lifted a boat with a crane high into the air, because we were just gonna drop it and smash it and the boat went high up into the air and then we had a quick release that let go of it. And then the boat came crashing down. And all of us were like "yeah! Oh, no" and then the boat shifted direction and fell right on top of our crane, like, "Oh, yeah, we should have planned this one out a little further for the worst-case scenario". I also learned during one of those experiments that you can't really arc weld in the rain when it gets too wet because you make a complete circuit and electrocute yourself continually while you're working on your welding project. So, lots of lots of life skills.

**Sue Nelson**

And was this what you know, having this much fun on this programme and sort of going into an area that you perhaps hadn't specifically planned, is that what really gave you this enthusiasm then for communicating science and engineering and the arts altogether, this so called STEAM aspect?

**Kari Byron**

Absolutely. I think I just got inspired by what it was doing and wanted to continue on with that, because I just love the effects that it had. I didn't know that I was even going to get into television, or, you know, curiosity communications because I was an introvert and pretty shy as a kid. I think people are pretty surprised that this ended up being my career. I kind of figured it out along the way, and I still do. So, I feel very fortunate that I tripped and fell into something that actually suits me very well. And I want to continue to amplify and signal boost people who are doing great innovations, and figuring out the world's big problems. So even my current show Crash Test World, I run around looking for engineers and scientists and people trying to solve the big problems of the world, keeping the oceans clean, keeping peace in places of great conflict, just anything I can find that people are doing that kind of work. I want to help communicate all the hope that's going into the people that are trying to change things.

**Sue Nelson**

Did it alter your perception of who engineers were and what they do, or did you sort of have an open mind right from the start?

**Kari Byron**

I mean, I think just running around meeting all sorts of people from all sorts of backgrounds. I don't have a picture of what an engineer looks like.

**Sue Nelson**

That's good.

**Kari Byron**

One of my best friends is an engineer and it's so funny to see. She always felt like when people close their eyes and thought of an engineer, they you know, they think of some nerdy guy with big glasses and, you know, she's this gorgeous woman who decided to actually take up that mantle of showing girls that engineering isn't something that's dominated by men. It's something that they can do too. She created an entire toy industry around it. I'm very inspired by the people that I've met along the way.

**Sue Nelson**

And with Crash Test World, how has the pandemic affected filming?

**Kari Byron**

Well, it was a travel show, so there's been a definite shift. I would love to get back onto the road, but clearly, that's not going to happen for a while. So now, I've shifted focus a little bit to keep up with what's going on now. I'm helping launch EXPLR Media, which is actually creating high production value, short format content with lesson plans so that it can be utilised in classrooms and for remote learning very intentionally. Everything from history, to math, to engineering, to even mental health. We're putting together these really amazing almost Instagrammable lesson plans so that maybe we can take a little load off teachers, we can really create some global citizenry and my goal is to see more empathy in the next generation. And I think we can do that by using technology in the way that kids use technology and not do it in a condescending way, like, if you want to teach

a 12-year-old something, talk to them, like their 35. Want to teach a 35-year-old something, you know, talk to him like they're 12. Same goes.

**Sue Nelson**

One of the other things that you've been involved with is a start-up called SmartGurlz where you acted as Chief Creative Officer teaching girls to code and this was with toys, bringing that whole STEAM aspect together, how did that come about?

**Kari Byron**

Well, I always wanted to be a toymaker. That was part of the special effects kind of thing. I'm a sculptor. And so, I kind of just cold called this company because they were doing such cool things. It was called SmartGurlz where they had these toys that were little scooters that were engineered, so cool the balancing of these scooters with these dolls on them, you could code them through mazes and make them act as you wanted and dance. It was a really cool way of putting play with learning. So, I asked if I could be involved with them. And you know, having a daughter just the right age, you know, I had a great audience to test out things on.

**Sue Nelson**

I've noticed something crop up here, which I can totally relate to, is that you've not waited for opportunities to come your way you've gone there. You asked, applied to be an intern, you said you cold called SmartGurlz. I mean, this sounds like a very important life skill that I'm often surprised that people don't have, which is don't wait for opportunities to come to you, you sometimes have to go out and knock a lot on a lot of doors.

**Kari Byron**

Well, I think it's really scary for people to go in with the idea that someone might say no, and that would create a failure. Like we always had on our hats at Mythbusters 'Failure is always an option', it's really just a step towards what you want to get to. And I just never felt like, the opportunities that come my way I say "yes" to everything. And then I try to create whatever I can, because I just, I want a very exciting life. The only way I can do that is by going for it myself. I wrote a book on a dare. It's like, okay, I want to be an author. I cold call people when I don't know how to do things, I always call an expert. I didn't know how to write a book, so I called a writer and asked for help. I feel like there's people out there in the world that want to help you. And the worst that can happen is if someone says no, and then you're not any worse off than when you started.

**Sue Nelson**

Oh, that's absolutely right. And that was how I was brought up as well. But you're right, failure, it is really important to know how to fail. What would you say is the something then that you've not done yet that you really do want you to do that you've got in mind?

**Kari Byron**

Well, I'm trying to figure out how to do an episode on going to Space.

**Sue Nelson**

Oh, yes.

**Kari Byron**

So that I catch a ride. Because I am just fascinated by everything that's going on in both the exploration and commercial space fields. I love asking people who are trying to do this grand idea of getting to Mars or creating settlements on the moon, I just, I want to know how they're doing it and what they're doing. And with the latest technology, and I spent a lot of time just calling experts, I gotta say, it has nothing to do with what I'm doing. I

just, I'm fascinated. So that's why I'm going to try to throw it into some sort of television show. So people will say yes to me.

**Sue Nelson**

Now, you mentioned your daughter, how important do you think the role that parents play is towards not allowing sons or daughters to exclude a certain career route, particularly in a very often, can be a very gendered world.

**Kari Byron**

I can't say I'm a parenting expert in any way. But I do know that when I see people passionate about what they want to do, it makes their kids passionate about it, too. So for me, the best thing I could have done for my daughter is, go for it myself, so that she can see that all opportunities are open to her and maybe the things that she's interested in, don't interest me, but I encourage them heavily. I want to see her happy and excited about what she's doing. Whether it's engineering, or currently, she wants to be a Congresswoman when she grows up, I'm going to back her in anything that makes her happy. I think it's very important that we follow our passions, but you know, include the kids so that they understand that they can do it too.

**Sue Nelson**

And you've taken what has happened as well in in in your past and incorporated it all together in our in a lovely sort of creative blend. And I believe that you're still making art and you're sort of making art with unusual substances that, you know, you came across during work. Is that right?

**Kari Byron**

Yes. I am sitting in my art studio right now and I was inspired by, after the explosions on Mythbusters, there would be just this detritus from the blasts. There was just this beautiful chaos to it. I started to see, I could predict the patterns of how things would work visually through the explosives we used. And I really like black powder. So, I started using it as a painting material. It's got a lot of charcoal in it so it works by, you know, dyeing the paper with the charcoal. I explode charcoal onto paper generally with areas that are masked off so that it can only explode where I want it to. And sometimes it turns out amazing, sometimes not so much. I have five different kinds of gunpowder and black powder in my cabinet that I can use to make different colours or different techniques. I've just continued to be, I think it's a thing, a black powder artist for years now. I haven't shown a lot of it other than through the internet. But it's something that I've always loved and I don't sell it but I generally do it for fundraising.

**Sue Nelson**

Excellent. Well, Kari Byron, thank you very much for sharing a fascinating career and good luck with your efforts to get into space. I wouldn't put it past you to get there. So, I shall look out for a programme where we see you floating in zero gravity and explaining it as well no doubt.

**Kari Byron**

Oh, absolutely. That would be amazing. Well, thank you. I've had a really good time talking to you.

**Sue Nelson**

Kari Byron, thank you for joining me on the Create the Future podcast. Find out more about the Queen Elizabeth Prize for Engineering by following QEPrize on Twitter and Instagram or visit [qeprize.org](http://qeprize.org). Thanks for listening and join me again next time.