

Captivating Creations with Bernie Zubrowski

KATHRYN YORK (PRODUCER): Hello and welcome to the Big and Little Podcast from Boston Children's Museum. I'm Kathryn, the Museum's Podcast Producer and Digital Content Manager. In our next creativity series episode, Museum President and CEO, Carole Charno interviews Bernie Zubrowski, an artist, educator, exhibit designer, and former Boston Children's Museum employee.

Bernie has dedicated his career to science education, both in and outside of the classroom. He has contributed to science curricula at the Education Development Center and designed numerous exhibits, traveling exhibits, and children's science books during his time at Boston Children's Museum.

His work has influenced many designers, educators, and parents globally, earning him awards such as the Faraday Award from the National Science Teachers Association and from the Massachusetts Engineering Society.

Bernie is renowned for creating hands-on learning activities that engage young people using simple materials. His 16 published books and 12 curriculum guides have been recognized for their impact on science education, including honors from the American Association for the Advancement of Science. He has also played a significant role in after-school programs and middle school science projects. Beyond science education, Bernie has spent the last 25 years designing and exhibiting kinetic sculptures, continuing to inspire creativity and scientific exploration. Let's dive in.

CAROLE CHARNOW: Hi, Bernie. Welcome to the Big and Little Podcast. We're so excited to have you as part of our creativity series.

BERNIE ZUBROWSKI: It's good to be here.

CAROLE: We have so much to talk about because you are a longtime and very good friend of Boston Children's Museum and have done some amazing work. So would you start by telling our listeners about your background? You've been able to throughout your career integrate art, science education, sculpture, exhibit design. What got you started on this path?

BERNIE: Well, I should go way back to my 20s when I worked at the elementary science study, which was a program funded by the National Science Foundation to develop curriculum for elementary school. That was a heading mix of scientists from MIT, Boston University, Harvard, and some very creative elementary teachers.

And I learned a lot when I worked there. And to some extent, it influenced my whole thinking about education since then. It got me thinking about pedagogy. How do you design activities that engage kids and move to some kind of productive result?

Then after that, I was there for several years and I went to Kenya to work for the African Primary Science Program, which is a number of us were in former English-speaking countries, and we were developing science curriculum for elementary school, working with African educators.

And that was a formative experience also because the challenge there was the schools had very little money for science equipment. So we had to improvise. One of the things I did while I was there was I noticed one day when I was visiting a school, I was looking at the ceiling of the school and had grass thatching.

And I was looking at the grass and I said, oh, that's interesting. Maybe I could do something with that. So I had kids bring in to school when I was testing this, the grass. It's about as thick as your little finger and it's pretty sturdy. It grows about 6 feet tall.

CAROLE: Wow.

BERNIE: And I gave them pins and I challenged them to build a house.

CAROLE: Oh.

BERNIE: The pins. And then we tested the house with a recycle can and some sand. I also did some activities with dyes and pigments, having kids bring in flowers and things like that. We soaked them in water and did some experiments with the colored solutions.

So one thing I got out of that is try to make use of what is at hand. In fact, well, I called myself a bricoleur.

CAROLE: Bricoleur?

BERNIE: B-R-I-C-L-E-U-R. Bricoleur in France-- it was-- I don't know if they still do that. It's a combination-- handyman, inventor.

CAROLE: Oh, wow.

BERNIE: And he still--

CAROLE: I love that.

BERNIE: His game was to make do with the things he collected. So when I was at the Children's Museum, I was bricoleur in residence.

CAROLE: Wow. Wow. That's a great segue to my next question, which-- it seems like this work you did in Africa really led the way to this idea of using whatever materials are to hand to--

BERNIE: Right.

CAROLE: --helping kids experiment and explore. So talk to us about your work at the Children's Museum. You were a developer here of programs. You did children's science books. You did curriculum. Tell us about your remarkable career here at Boston Children's Museum.

BERNIE: Well, I was here about 23 years. And the first five years or so, I worked what was called community service. Several of us worked with after-school programs and summer programs, providing resources for them.

We had monthly workshops where we showed them different art and crafts activities and some informal science activities. And I myself went out several times a week to these after-school programs trying out different ideas. I did that-- I don't know, I guess six to eight years or so.

Then when the desegregation of the Boston schools came along, they put together special funding for cultural institutions and different places like art museums, science museum, children's museum. Had programs for Boston kids and suburban kids.

They brought two classrooms together and they came here to Children's Museums for eight sessions and we joined up with a Black Arts group called Tribal Rhythms. And I did some science and engineering type of activities and they did some group-building activities.

CAROLE: Wow.

BERNIE: Then-- I'm not sure when I did this, but I worked with Boston University students for a number of years as part of a course in community education, doing the science part of it. I think I started doing the books about-- in the first 10 years or so. And over 12 years, I wrote a book a year.

CAROLE: That's remarkable.

BERNIE: Yeah. And then toward my end of the time at the museum, we got a grant to do eight traveling exhibits that were traveled by the Association for Science and Technology Centers.

CAROLE: Yeah, ASTEC.

BERNIE: Yeah. And those were like bubbles, raceways, spinning tops and yo-yos, waves, salad dressing, physics, that sort of thing. Then in the last few years, we managed to get a grant from the National Science Foundation. And I decided in middle school physical science curriculum, working with Boston teachers, helping me put that together. So I wore lots of different hats while I was there.

CAROLE: Yeah. It's so interesting because you could have gone in the path of being a classroom teacher, BERNIE: Right.

CAROLE: But that may have been too confining for you, I would imagine.

BERNIE: Well, when I came home from Kenya, I was looking around and trying to figure out what can I do? And I like so much designing curriculum and designing activities for kids that I decided that the classroom would be too confining.

So I looked around and-- actually coming here was serendipitous. I was looking around for work and somewhat, I think at MIT I went over there and talked to some people and they said, hey, Jim [INAUDIBLE] over at the [INAUDIBLE] is looking for people.

CAROLE: Oh, right.

BERNIE: I came here and they hired me temporarily because they didn't have enough money. I sort of lived on the basic salary for several months and then a grant came through. And then I was hired here full-time.

CAROLE: Then you were here.

BERNIE: Yeah.

CAROLE: Yeah. That's still how things happen here to some extent. [CHUCKLE] But I want to tell our listeners, they may not-- they're not likely to know this, but your exhibits have become absolute fundamental to most children's museums in America.

I would be surprised if there was one children's museum that did not have a Bubbles exhibition and possibly also raceways. And they are just timeless, these exhibits because of the phenomenon you work with. So can you tell us a little bit about bubbles and raceway's, two beloved exhibits that are here still at the Children's Museum?

BERNIE: Well, actually, I started blowing bubbles in Kenya.

[CHUCKLES]

I-- toward my end of a work there. I decided that bubbles would be interesting to do, relating it to geometric forms and all that. So I got some hand soap and I took the outer part of BIC pens as a tube, and I had kids blowing bubbles on tabletops.

CAROLE: That's ingenious.

BERNIE: And then when I came to the museum, I built on that and discovered that joy dishwashing soap was really terrific. It could make really big bubbles. And so I started blowing it on after-school programs, trying out different activities.

I eventually put a book together that was published-- I don't know, about 30 years ago, I guess. And then raceways, I'd actually seen a physics demonstration that was demonstrating something about motion. It used a track. And it occurred to me that one could probably do more with that.

So I went into after school programs-- well, first of all, I usually-- what I do is play around with the materials myself and see what's possible and narrow it down to possible types of activities with kids. And then I go into after-school programs, which is a whole different situation from school. Because at that time, it was drop in and either the kids stayed with it or they did. You had to have a good activity--

CAROLE: Yeah, to keep them--

BERNIE: That kept them there. Yeah.

CAROLE: Yeah. Yeah.

BERNIE: So first thing I put out is a track, a can of marbles, and another can. And I think-- sometimes I didn't have to tell them, they would automatically take the track. They worked in groups and they would put the track on the chair. They'd put an empty can in front of the chair, and the game was to roll the ball down the track to get it into the can.

CAROLE: Right. Right.

BERNIE: Then I figured out, well, there's other things you could do. So I had to make loop de loops. And then a big u that was like 10 feet long, rolling the balls back and forth along a parabola and a few other activities like that.

So I did a lot of that, mostly in after-school programs. And when it came time to start designing exhibits, I just took those activities, went to the shop people, and say, well, here's what I would like to try to do.

CAROLE: Wow.

BERNIE: And they-- God bless them-- managed to put together the practical manifestation of that.

CAROLE: Yeah. And they're still here today. I mean--

BERNIE: That's like--

CAROLE: [CHUCKLE]

BERNIE: I think it's 35 years ago or something.

CAROLE: Well, I wanted to ask you about your impact. I mean, I think that your time here at the Children's Museum for 23 years and all your subsequent work had a major impact on defining what a Children's Museum is. This idea of open-ended play and exploration. How do you think that impact happened? It's quite remarkable the tremendous effect of all the work that you did here.

BERNIE: Well, we had-- by that time, the museum had a pretty good reputation. And we would get visitors from all over the place, from all over the world sometimes. In fact, one time I met a woman from Sweden who came to visit museum and she went with me to an after-school program, and we did balls and tracks.

CAROLE: Wow.

BERNIE: And she invited me to Sweden afterwards. So we had this continual stream of visitors, but it also was not just me. There was Janet Kamien, who did what if you could exhibit about different kinds of handicaps. She also did an exhibit on death and dying.

CAROLE: Yeah.

BERNIE: And Joan Lester did a lot of work about Native American culture, and other folks like that did programs that had some impact nationally to some extent. So it wasn't just me, it was all these other people. And when I got to the museum, it was the 70's. There was a lot of reform in education.

CAROLE: Yes, that's right.

BERNIE: The National Science Foundation funded a whole bunch of programs once to do new science curriculum. And the National Art Organizations were also trying to do different types of art activity. So at

that time, there was a big interest in education. And also at that time, there was a growing interest in children's museums. So I think all of that combined--

CAROLE: Yeah. All that growth together.

BERNIE: Right.

CAROLE: It's sort of an explosion being in the right place at the right time. I know that you won many awards and you were very much recognized in the museum realm--

BERNIE: Well, not just the museum world, but also in science education.

CAROLE: In science education. The National Science Teachers Association Award,

BERNIE: Right.

CAROLE: The American Association for the Advancement of Science.

BERNIE: Right.

CAROLE: So you were at some point, and-- you even mentioned that you were out at the Exploratorium out in San Francisco, which is also a really groundbreaking institution.

BERNIE: Yeah, yeah.

CAROLE: Now tell us about that a little bit.

BERNIE: Well, it was interesting. Frank Oppenheimer, who headed the Exploratorium at that time, was interested in perception. And he had a lot of artists come in and do exhibits. So some of the exhibits there were as much about art as about the science of perception.

CAROLE: Interesting.

BERNIE: So it was interesting to see these kind of exhibit. However, his pedagogy or the pedagogy that was happening there was different from mine. They had single stations--

CAROLE: Yes.

BERNIE: --with different kinds of phenomena.

CAROLE: Right.

BERNIE: Whereas my whole approach is to have multiple activities with the same phenomena. And that makes a big difference, particularly when you're designing science curriculum. But it was interesting. I met some interesting people there. In fact, later on, I went there and did a science-in-residence for a whole summer installing one of my sculptures there.

CAROLE: Wow.

BERNIE: And that I went a second time and did an artist in residence there also. So it's a great place. And I really like being with the people that work there.

CAROLE: Yeah. You make me think of something. This difference in the pedagogy we're talking about between us-- you here at the museum and the Exploratorium. Talk a little bit about, for us if you will, about this idea of exploring just one phenomena and the kind of communal activity that happens amongst children and their families in that exploration, which is very different than going into a science museum and it's just you and that one module. So your philosophy has a very different impact on kids. Like how do you think about that?

BERNIE: Well, when I was designing engineering curriculum, we explicitly had kids formed in groups because of the limited amount of materials. But in terms of exhibits, the way we set up the stations in a particular exhibit encouraged people to work together.

CAROLE: Right. Right. Right.

BERNIE: I remember one-time watching people in the raceways exhibit. There was the big U, which at that time was bigger than-- the one here now is 16 feet long.

CAROLE: Wow.

BERNIE: There are two parabolas. And a father is at one end and a boy at the other end. And they pick up the golf ball and rolled it to each other back and forth. It's like they were having a conversation.

CAROLE: Oh my goodness. That is so cool.

BERNIE: And some other-- and then I used to do a program with milk carton building blocks about-- I bought out a cart of milk carton building blocks. And I have people build them. And often a parent like the mother would sit down on the floor and the kid would build a tower around her. [CHUCKLE]

CAROLE: Wow.

BERNIE: And then she--

CAROLE: [CHUCKLE]

BERNIE: And then she would break out of the tower.

CAROLE: I love that.

BERNIE: So to some extent, I didn't necessarily design it to be social, but some of the activities were such that it encouraged people to work together.

CAROLE: Right. Which is a wonderful--

BERNIE: Yeah.

CAROLE: --experimental environment in children's museums.

BERNIE: Right.

CAROLE: You know, and particularly as there are so many different kinds of people and age groups that come to the museum--

BERNIE: Right.

CAROLE: And to have them all interacting with each other has a societal benefit, I think.

BERNIE: Yeah. Yeah.

CAROLE: Yeah. I want to switch gears a little bit and talk to you, Bernie, about your work as an artist. I was very lucky to visit your studio not long ago, and I was just overwhelmed. First of all, with the amount of work that you've done in so many different-- these stunning kinetic sculptures that you've done. And I'd love to hear about how your work led you to that kind of experimentation and about your work as an artist.

BERNIE: Well, when I was at the Children's Museum, I did a whole bunch of projects that involved motion. Because there's balls and tracks, but then there's tops and yo-yos, waves, windmills, water wheels. And there was other types of activities like that. So I got to see how kids reacted to things that move. And that was always in the back of my mind as I was doing that maybe I can make some sculpture with that.

And what got me started off in sculpture was I saw an exhibit by Konstantin Milonadis, a name hardly anyone would recognize. He's mostly from the Chicago area. And one time I saw an exhibit by him that were these small, very delicate kinetic sculptures. And that was like 50 years ago or so. And that it really impressed me. And I said, one day I'm going to try to do something like that.

So as I was doing a lot of design activities and playing around materials, I started to realize that maybe I could do sculpture. And so at home, I started playing around with different kinds of materials.

Like, one thing that set off a whole bunch of sculptures is a physics demonstration device, a ray machine. You have to imagine a tape hung vertically about six feet long, and then straws are placed horizontally every inch or so down this length of tape.

Another piece of tape is put on this to hold the trolls in place and then paperclips are put on the ends to give it some weight. If you have another weight down at the bottom and move the weight down at the bottom, you give this lovely spiraling motion. And I studied that spiraling motion for a while. And then I realized, well, maybe I could put other things on the tape besides drinking straws.

So one of the things I did is put circles made out of wire that got bigger and bigger and bigger. It was a nested set of circles. And when that moved, it also made a lovely motion. And then I said, well, I could put other shapes there besides circles. So I started putting triangular shapes. I also made 20 different kinds of pieces like that.

CAROLE: Yeah.

BERNIE: And I played around a little bit, which missed. And I did an artist-in-residence at the Exploratorium playground with mist. And I did a mist that falls straight down, which is tricky. It doesn't sound as easy as a sound. I played around with it a lot before I could get it to fall vertically.

CAROLE: [CHUCKLES]

BERNIE: Yeah. But I considered what I did in sculpture somewhat separate from what I did in terms of science education. The emphasis in my sculpture was on the aesthetics of the phenomenon. And also related some basic concepts. But what I did in science education, I did work with aesthetically interesting materials like bubbles, mirrors, shadows--

CAROLE: Yes.

BERNIE: --air, water movement. But when I did those, I was focused on what can I do when a series of activities or gauge the kids exploring like properties of light with mirrors and get to understand something about the properties of light. When I did mirrors at home, I was strictly interested in what happens with different kinds of reflections of a person.

CAROLE: Oh, wow.

BERNIE: And I did one thing that was interesting. In fact, someone in Britain did a copy of it. It's in my mayor's book. I have a series of plexiglas that sets them behind each other. And they're on a stand and not have a light shining on the person's face. And one the Plexiglas's moves, you get six different reflections moving back and forth.

CAROLE: Oh, wow.

BERNIE: I called that schizophrenia. [LAUGHTER]

CAROLE: I love that. I just think about the delight of the children in playing with all these different--

BERNIE: Yeah

CAROLE: --environmental phenomenon.

BERNIE: Yeah.

CAROLE: It must be just so fantastic to watch.

BERNIE: Well, that was my goal. I figure if you're going to try to do something, as it goes back to elementary science studies, you first of all have to get the interest of the children--

CAROLE: Right.

BERNIE: --and get them invested in what they're going to do. And if you don't have that, then it becomes a matter of what some people call extrinsic motivation. They're doing it to get a good grade--

CAROLE: Yes.

BERNIE: They're doing to please the teacher and all that.

CAROLE: Yes.

BERNIE: And they're not fully invested in the process.

CAROLE: Yeah.

BERNIE: So the learning is not as deep.

CAROLE: Yeah.

BERNIE: I think anyway.

CAROLE: Yeah. And I'm thinking about the word play because this kind of hands-on experimentation you're talking about with kids is so intrinsic to this work that you do that you.

BERNIE: Well, I did a lot of reading about play research back in the-- back in the 70's or so, there was a lot of research on animal play and children's play. And in fact, I went to one or two conferences on play. I thought that's really important when you're thinking about education. Not enough happens in school and even in kindergarten or preschool, there is not enough play happening.

CAROLE: Yeah.

BERNIE: Nowadays they're pushing kids with worksheets and all, which is to me ridiculous, particularly with preschoolers. So what I got out of reading about play was there are some basic characteristics. One, there are boundaries. I mean, you think of a game, any kind of game has boundaries and rules.

And in fact, related to that, I was reading a book last week by Toomey Kingdom Play. It just came out a few weeks ago, and he was writing about how juvenile rats play. And the people did the research, observed that when it came two juvenile rats playing, the stronger one would hold back and self-handicap.

He set up a boundary to play with him. And I think that's important to keep in mind when dealing with play. The other basic characteristic play is a variation. When animals play, they vary how they do their fighting and all that. When kids play, they're very what they do.

And when I was designing activities, a game, I played in my design process is a boundary, working with just one phenomenon with a limited set of materials and trying to vary what you could do to materials to produce a kinetic set of activities that will lead to a situation eventually, as they got more acquainted with the phenomena to induce basic science concepts.

And I did some design engineering curriculum that sort of like the same way. That was a different process. You gave the kids a basic set of materials and had them design a balloon-powered car or a windmill or something like that.

And again, it was a confined set of materials and focused on one type of technology. So that was my rule of thumb, whatever I started a different set of activities.

CAROLE: Which I think explains to some extent the viral nature of the work that you've done in the Children's Museum movement because it's so simple--

BERNIE: Yeah

CAROLE: --in a way. And yet so profound in what kids are doing. I mean, this idea of introducing a very basic science concept through this one phenomenon that they're exploring.

BERNIE: Right.

CAROLE: Yeah. That's fantastic. You talk about-- you have several websites.

BERNIE: Right.

CAROLE: Can you tell us about all your websites? And about your books, too.

BERNIE: Well, what I like to talk about-- because I put it together a few years ago. In fact, we were talking about it before it's called Synchronizing Art and Science. And I put that together because about 15 years ago, there was a growing interest of bringing art and science together.

A number of school districts around the country adopted this approach with some of their elementary teachers and middle school teachers. But when I looked at the materials that were being produced on the web and elsewhere, I felt they were too superficial.

I think particularly when teachers, as it was written, and maybe how the teachers did it, they shortchanged the science. If an elementary school teacher was trying to do both a science and art activity, they probably shortchanged the art activity.

So I felt there should be parallel investigations around the same phenomena where there's a coordination between the art teacher and the science teacher. So one example of that is I had a project on dropping food color on white paper towels.

In the art class, the kids could be artists and drop the food coloring on the paper towels, making different kind of designs. And one type of variation is to put the food coloring on the paper towels and put water on and have the design spread out.

Now, when you do that with a mixture of food coloring, the color will spread out. And every time you do it, the red always goes on the outside, and the blue stays in the middle.

CAROLE: Oh, really?

BERNIE: So this is a question for the science class. Why does this happen? So in the science class, they go through a bunch of experiments to determine what's going on here. And then you take this further.

Well, what happens if instead of water, you use alcohol, acetone, cooking oil? I think I use baking soda solution and vinegar. You get different kinds of separation when you use these liquids.

CAROLE: Wow.

BERNIE: And then what happens when you use bleach on food coloring? You put bleach on top of food color and the bleach eradicates the color. So you can make designs where you put colors down and very judiciously add bleach to get a different kind of aesthetic effect.

CAROLE: Wow.

BERNIE: And in the science part, you start to look at, well, all these things that we're doing, are you dealing with solubility of liquids? And with the bleach reaction, you're doing with chemical reaction. So there was a back and forth between what happens in art and what happens in science.

CAROLE: Bernie, I can really understand why the kind of work you do is better for after school than in school. Because I was just thinking about the wonderful experimentation of food coloring and all these different liquids that you were putting on them. And in the context of a classroom, I would imagine that level of experimentation is too much. But it sounds to me like that's the best way to learn science.

BERNIE: Well, actually, in the middle school science curriculum I did, some of those very activities were put in a curriculum--

CAROLE: Oh, good.

BERNIE: And some middle school teachers did do them.

CAROLE: Oh, good.

BERNIE: In fact, when I left the museum, I went to the Educational Development Center. We did a teacher mentoring program. And we worked with mentor teachers doing activities. And I did some of these very same activities as part of the curriculum.

CAROLE: Right.

BERNIE: And they did do it in the classroom, the more adventuresome teachers.

CAROLE: Oh, good. Good. Good for them.

BERNIE: But actually, it is a challenge trying to get the art teacher and science teacher to work together.

CAROLE: I can imagine.

BERNIE: Get scheduling problems and all that.

CAROLE: Yeah, I can imagine. So we talked about your synchronizing art and science website. You also have a sculpture website,

BERNIE: Right.

CAROLE: Correct?

BERNIE: Right. Well, there isn't much to say about that. It's online. It's been up there for-- I don't know how many years. I put a bunch of kinetic sculpture videos on YouTube also and Vimeo. Haven't had many views, but they're out there for people to take a look at.

CAROLE: Yeah. Yeah. Let's talk about how people can access this work and even try to do some of the work themselves. I noticed you've written so many books. They are available, many of them on Amazon and on secondhand booksellers online.

BERNIE: Yeah. I'm surprised those books were done 25 years ago.

CAROLE: But they're still really relevant.

BERNIE: Yeah, they're still-- I think they're definitely relevant and I'm surprised they're still available.

CAROLE: Yeah. Yeah. When you think of how fundamental, we talked about this earlier. The work that you're doing and the excitement that the kids get and the accessibility of the materials, you can see why these books are still so relevant.

BERNIE: Well, they're definitely relevant because nowadays young children and older children spend so much time in front of a screen--

CAROLE: I know. I know.

BERNIE: --that I think it's probably a challenge for parents to get them to do some of these activities, even though the activities are very engaging.

CAROLE: Yes.

BERNIE: Socially they're involved with other kids, with the same kinds of games on online and all that. But there are some kids out there who like playing around with materials, for sure.

CAROLE: I mean, we have thousands of listeners, and I would recommend the educators and parents look up your books online because there's just endless opportunities. We do have on the Children's Museum website, 100 Ways to Play, which has some of your activities in it as well.

But let's just talk about your advice to parents and educators. You touched on the different environment that children are growing up in now, and there's just been a lot about young children scrolling and scrolling. How would you advise parents to get their kids off the screens and doing this kind of activity?

BERNIE: Well, from all I've heard on the radio and elsewhere, it's really a challenge.

CAROLE: Yeah.

BERNIE: I think parents just need to say time out--

CAROLE: Yeah.

BERNIE: --with screen time and have kids do something different.

CAROLE: Yeah.

BERNIE: Have them go outdoors, for instance.

CAROLE: Yeah.

BERNIE: I don't have an answer for that. Because I know it's really challenging.

CAROLE: Yeah.

BERNIE: I look at my grandchildren and I tried to get them involved in some of the same activities we've been talking about, and that wasn't quite easy. They do a little bit of it and then they would lose interest because it wasn't the same as the immediate feedback you get from working on the screen.

CAROLE: Yeah. Yeah. We are thinking of doing some work on our podcast.

BERNIE: I do think, though, that children's museums like the Children's Museum here and across the country could do a real service to parents by providing them examples in the museum of how children can play with--

CAROLE: What they can do at home? Yeah.

BERNIE: And promoting various kinds of programs.

CAROLE: Yes.

BERNIE: Like workshops that parents and kids could attend together and do activities together.

CAROLE: Yeah.

BERNIE: Something like that.

CAROLE: Yeah that's what we try to do here. I mean, I think you mentioned something that's really key. If the parents sit by the side of the child and do the activity, I think the chances of them carrying on are much--

BERNIE: Yeah.

CAROLE: --stronger than if they're just placed in front of these materials and left to their own.

BERNIE: Well, I was thinking one of the things the parents could do was maybe they could have mini playgroups after school. Have their son and daughter invite some of their friends and the parent. I'd be looking at my books or elsewhere, like online, and gather some materials, get them started on an activity. And because it's a more social situation of a group of kids playing together, I think it will go longer because the kids sort of play off of each other and doing the activities.

CAROLE: Yeah.

BERNIE: It's a more social situation.

CAROLE: I think you're right. When we do our annual Created By festival, which is a big maker festival, a lot of the groups that come to present are family groups--

BERNIE: Yeah.

CAROLE: --that have gotten together to build robots and do various experiments. And I can see that these kids really gravitate to one another. They have a lot of fun together.

BERNIE: Well, doing things as a family together is good for the family.

CAROLE: Yeah, it is. It is. And these things are so much fun and so easy to do.

BERNIE: Right.

CAROLE: So we talked a bit about how people can find out about your work. You have your websites, you have your books that are available online. You have many YouTube videos.

BERNIE: Right.

CAROLE: So is there any other way that people can find out about your work? There's so much to learn from everything you've done.

BERNIE: Well, they can email me and--

CAROLE: OK.

BERNIE: If they some questions.

CAROLE: OK.

BERNIE: I'm retired, so I got lots of time.

CAROLE: That's right. Right.

BERNIE: The sculpture website, I have a contact email address.

CAROLE: OK, fantastic.

BERNIE: Yeah.

CAROLE: And we can set that up as well. So again, I just wanted to reiterate that we are so honored to have you on our podcast today. Because, Bernie, you are one of the seminal leaders of children's museums in the country. I can't imagine how we would have become who we are without you.

BERNIE: Well, thank you.

CAROLE: And I want to thank you on behalf of the entire field for everything you've done for us and science education, and thank you so much for being here today.

BERNIE: Well, thank you for having me.

[MUSIC PLAYING]

KATHRYN (PRODUCER): Thanks for listening to this episode of The Big and Little Podcast. And thanks to PNC Bank for sponsoring this podcast. Be sure to like, comment, and subscribe, and stay tuned for more.