Coaching Corner: Full STEAM Ahead: Using Practice-Based Coaching to Support Science Teaching

Kristin Tenney-Blackwell: Welcome, everyone, to this month's Coaching Corner webinar, Full STEAM Ahead: Using Practice-Based Coaching to Support the Teaching of Science. My name is Kristin Tenney-Blackwell. I'm an educational consultant with Vanderbilt and supporting the work of the National Center on Quality Teaching and Learning.

So, I'll be just one of the hosts for the webinar series. And I'm joined here today by Kathleen Artman Meeker, an assistant professor of special education at the University of Washington. She's served as a special education teacher, a coach, and a researcher, and we've been so lucky to have her with us for several webinars. Welcome, Kathleen.

Kathleen Artman Meeker: Thanks, Kristin.

Kristin: Yep. We are so happy to have all of you with us today. And our topic is helping coach teachers around the teaching of science. And Kathleen's going to walk us through the components of practice-based coaching as well as identify approaches and strategies coaches can use in their work with teachers. So, welcome again, Kathleen.

Kathleen: Great. Thanks so much, Kristin. I'm excited to be back and talking a little bit about science today. So, I was looking at your -- at all the comments, the captions everyone wrote, I saw learning through play, a sense of wonder, learning is fun, and that's really what we want to capture today. And, as you know, every month, our goal is to continue building a community of coaches, let you know a little bit about who we are, these voices on the other end of the line.

And so, this month I thought I would share some science-centered pictures. And as I was reflecting on science, I was thinking about science in two ways. We have the formal science that we might think about, like you see me here geeking out about a dinosaur bone at Dinosaur National Monument in Utah, and kind of that science that's formal, in a sense of out in the field or in a lab.

But we also think of science as the sense of discovery that all of you talked about in your captioning, that there's magic in mud puddles. And science is accessible to us every day; no admission fee required; no advanced degree or safety goggles, that every day young children explore science and think about the world through the sense of wonder. And that's really what we want to capture today as we're thinking about science and scientific thinking. So, thanks again for having me, and pass along to Kristin, who's not in as balmy a part of the country as I am today.

Kristin: But I'm right there with you, Kathleen, in the sense that looking at the feedback from participants, and as you were describing it, there are so many ways to think about science. And for me, living in Michigan, nothing says winter more than cold and icy experiments. And we definitely have our share of opportunities to dig into science by heading outdoors, finding snow.

I mean, in addition to just nature to explore, like pines and pine needles, evergreens. And right here you can see our youngest daughter, she's 3. With some help of her two big sisters, they created this

snowman together. And just about every day they go outside to see what might have changed with their snowman.

For example, on the days that we're fortunate enough to have some sun, the snowman begins to melt. So, it's like our little melting snowman science experiment.

Kathleen: Well, I hope you get lots of sun, but I hope that snowman sticks around.

Kristin: Yeah, we sort of want him to stay; although, you're right, we would like some sun. So, we know that -- or we know that there are experiments -- experiments and times to investigate and certainly stay curious all around us in our work with young children.

So, I'm just thrilled, again, that you're here with us today along with everybody else who joined in to discuss ways we can support teachers and discuss support that teachers might need around teaching science and STEAM, to really explore examples of practice-based coaching in action, and certainly continue building a community of coaches.

So, you're likely familiar with the practice-based coaching model. And this is the framework that we're going to use to think about supporting teachers around teaching science. And during our time together today, we're going to walk through each step, and you'll be able to leave the webinar with tools and resources that you can use.

Kathleen: So, as we were planning this webinar and discussing who we should invite to join us, we tossed out name after name, and each time our response was along the lines of, "Well, they're not really a science person," or, "That's not really their content area." "Who can we get to really come talk about STEAM?" And suddenly one of our team members said, "You know, if we can't figure out who is, quote, 'scientific' enough to lead this webinar, how are we supposed to expect people to coach on it?"

This is happening in schools and Head Start programs. We want this -- we want everyone to think about science. And so, that was really an aha moment for our team, and it led us to think about today as a chance for shared inquiry and curiosity. So, we're all scientists. You might work with teachers who have a fear of science or math, you might be a little bit ambivalent about science or math yourself, or maybe, you're excited about this topic. But we're here to say that all of us are scientists, and we're approaching this as a process of thinking.

Kristin: Oh, that is so true, Kathleen, and I feel really happy to kind of be then part of it the way that you described it, because I'm certainly one of those people who can sometimes say, you know, science really isn't my background. And these feelings are real and certainly impact what we're able to bring into our work, whether we're teachers or coaches. And it reminds me of the collaborative partnership that we highlight in practice-based coaching, those working interactions between a coach and a teacher that provides a safe place to share these kinds of thoughts and feelings as well as stay curious and ask questions and discuss challenges we might be having.

Kathleen: That's exactly, exactly right, that we're making ourselves kind of vulnerable here. If we don't necessarily maybe feel comfortable with a background in science or teachers don't, that we have this safe place to feel vulnerable and ask questions and explore. Absolutely.

And so, for those of you who were with us last month and learned about my Lego mania taking over my home, I had a little homage to scientists and Legos that I thought I'd share with you again this month. Ghostbusters quote here. "I'm a scientist!" So, just wanted to bring that in, that we're all scientists and we all get to have a little bit of fun. Oops, so there should be a video here that we can pull up.

Great. So when I mentioned magic and mud puddles earlier, I want us to take a minute to watch this really very brief video of kids exploring their world. And so, as you're watching, let us know, how are these children scientists? What do you see that shows these children thinking like scientists?

[Video begins]

Boy: Hey, I need a little bit a water to turn this into mud. I'm going to use some water to turn that into mud. There. Stinky mud.

[Video ends]

Kristin: We've got folks saying we're mixing ingredients to change how things look and change the properties. They're experimenting, they're predicting what'll happen, really exploring using tools, measuring language. Having conversations about their discoveries. Absolutely.

Kathleen: Communicating what they see, making observations. I really appreciate how everyone is seeing the science in everyday experiences here, that when children are exploring the world around them, they're scientists. It might be dramatic play in an outdoor kitchen; it might be in the classroom somewhere; but they're scientists exploring the world around them. And for young children, science is about the process. It's exploring, questioning, trying out ideas. And this brings us to the scientific method. So, we're going to start with what we know.

The scientific method is a series of steps that help children understand their world. And this content -- these teaching practices are from the in-service suites, the NCQTL in-service suites. So, one of our goals here is to help kind of connect the dots between resources that are available to you through NCQTL. So, we start with the scientific method. Teachers use the scientific method when they help children ask questions, when they ask children to observe the world around them or set the stage for that to happen, when they encourage children to predict during activities, create opportunities for children to experiment or try out ideas, and when they have a platform for children to discuss the results of their experience -- experiments or their investigations. And remember, these steps don't always happen in order.

Sometimes, things like observing and predicting can happen over and over again, like we saw the children in the mud puddle -- or in the mud kitchen, adding water to make mud, observing and predicting over and over again while a child is curious about a specific situation. So, we're thinking about

the scientific method as a process. It's a way of thinking and an approach to asking and answering questions. We're not talking about scientific products, formal trials that take place in a lab under controlled settings; we're talking about thinking like a scientist.

And actually, when we get down to it, great scientists think like children. So, we're really encouraging children to follow their natural curiosity and explore the world around them.

Kristin: Oh, absolutely. I mean, science is just a natural part of our world. It's like our way of being, right? Maintaining the act of inquiry and staying curious. And we certainly display these ways of being as coaches.

Kathleen: Absolutely, that reflective process, being curious about teachers' practices. Our first step as classroom scientists, coaches. So, I'm going to walk you through the teaching practices that are part of the scientific method, what you would see teachers do in classrooms who are using the scientific method. And then we'll break down the practice-based coaching aspect of this, supporting this work.

So, the first step of the scientific method is to form a question about the world. Teachers encourage children to do this by giving them time to express the questions that naturally come up. Like this morning, walking to the bus with my daughter, "How do squirrels eat nuts?" "Why are those flower petals on the ground?" All of those kinds of questions that naturally come up are important because it sets the stage for the experimentation and the investigation that's going to happen later on.

Teachers encourage children to ask questions when you see teachers modeling curiosity and questioning throughout the day. So, children are full of questions. We know this -- any of us who have spent time in preschool classrooms know there are lots and lots of questions. And so, teachers can listen closely, take advantage of those opportunities, and ask questions themselves that take children just a step further.

So, an example that we might see is a child playing outside and exclaims, "Oh, no! The plant! What happened?" So, they're asking a question. And the teacher can use this child's question to create a project around the question: What do plants need to grow? So, they create this kind of ongoing inquiry into the child's original question about plants and provides an opportunity for everyone to explore their curiosity about how plants grow.

Kristin: Great. Oh, my gosh, this great example of how teachers can continue to acknowledge and really foster these natural abilities and curiosities, helping children carry out their scientific wonderings. And as coaches, it's kind of like this side-by-side piece. We're helping teachers do this very same thing. We're helping them formulate questions around their practices, explore, and what they're noticing in their work with young children.

Kathleen: Absolutely. And as we go through the scientific method, next we think about observing. So, the second step of this process is for children to use their senses and really observe the world around them. So, we encourage children to wonder, to explore, ask questions, gather as much information as possible related to their initial question. And this information can be gathered by observing outdoors, looking at all of the plants that they see around them, through books that the teacher makes accessible in the classroom, and other resources brought in by the teacher and children.

So, we can use a variety of sources, like technology, going online and looking up information about plants, trying to figure out what kind of plant it is outside on our playground, when it blooms, when it doesn't bloom, those kinds of things, what it does need to grow. And children are encouraged to share with each other what they already know about plants in their environment, and they're given lots of opportunities to explore and express their curiosity about the ways that plants grow. They're encouraged to go on nature walks around the school, they look at books and educational and web-based resources related to the process of plant growth, and children document their experiences as well. We can use digital cameras. You might see teachers having children draw plants at different stages, acting out how plants grow, creating Play-Doh or clay creations of plants, discussion, et cetera, to extend their observations.

So, you might hear quotes from teachers like, "Let's look at some of plants that are growing around our school. What do you notice about the places where they're growing? Put your fingers down. How does that soil feel around them?" So, the children are having a skilled guide at their side to help them explore what they were curious about to begin with. And so, as a coach, you're going to be looking for opportunities to be that same skilled guide to help teachers see these opportunities and capitalize on them.

The next step in the scientific method is thinking about making predictions, or guessing the answer to that initial question. So, we help children make their best guess or prediction based on all of that information that they've gathered through their exploration and their observations. And so, our initial question, what do you think plants need to grow, what do you think would happen if we gave water to some of the plants, but not others?

And so, the teacher's setting up this kind of intentional opportunity to make a prediction or a guess about the future and for children to formulate predictions about what plants need to grow. And this example highlights how the teacher asks the children to form a guess rather than just continuing the activity without asking the children to guess. So, that process of giving children space to make a prediction, to take a risk, and be right or wrong and test it out, sets the stage for the experimentation that's going to happen as well.

Next in the scientific method, children are given the chance to test out that prediction. So, children are helped to set up an experiment that allows them to test it out. Teachers might use guiding questions, such as, "How can we test this," "What could we do to see if this is true?" So, ideally, the children determine the course of the experiment. One design might be that each child plants two of the same type of seeds in two different pots, and one pot gets water each day, and the other doesn't. And they collect information over the course of the day with children's journals or photos or comparisons. And this highlights how the teacher asks the children to decide how to test their ideas rather than just telling them how plants grow best and not providing an opportunity to test out those predictions.

So, as a coach, we want to see that teachers are really giving children lots of opportunities to talk and express their ideas and really think about how they would test out a question. Because that's an important skill for them as they grow. And finally, we want children to have opportunities to discuss the results of their experiment. So, we help children, teachers' help children examine and analyze that data or that information that they collected. So, all of those artifacts that they collected or that documentation that they had of how plants were growing with and without water is all going to be discussed and brought together with the children.

We celebrate the children's curiosity and their ability to follow through and get an answer to their question. And so, an example that we might see here is a teacher having this intentional opportunity again for children to come together and have a conversation about the children's observations and their drawings and their measurements, and they draw a conclusion.

So, you see the teacher up here saying, "Let's look at our two plants. Remember we treated each plant differently? This first plant got water, and the second didn't get water. What happened to the plants? Which plants grew the most, and what do you then think plants need to grow based on this observation and this experiment?" So, we see here a teacher who's really prompting children to talk about the results of their experiment by asking which plant grew the most rather than just summarizing back for them what happened or giving children the answers.

And this experiment helps children answer that part of their original question in step one, what do plants need to grow, that came out of the child's curiosity about a plant that hadn't been growing. What happened to the plant? So, the teacher's been really intentional structuring opportunities for children throughout the scientific method -- or using the scientific method as a tool to answer these questions.

Kristin: Okay, so now we've got this understanding around the scientific method, and thanks to Kathleen, and so here we are, and probably also thinking, okay, now as a coach, how can I continue to support a teacher, how can I move forward with a teacher; where would I start in supporting them teaching around science and the scientific process?

So, once we know the practices that teachers are likely to need support around, we can begin supporting them through this process of setting goals and developing plans for achieving those goals. And our first step really is to have a clear understanding of the teacher's strengths, needs, and interests. And we often refer to this, or it's known as a needs assessment. And we can use needs assessment tools for any set of teaching practices.

So, today we're going to explore tools that can help us support teachers around the scientific method. And the tools we'll talk about today certainly can be used by a coach and they can also be used as a self-reflection tool for teachers.

Kathleen: So we're going to take a slightly different look at needs assessment than we have in previous months just to kind of show you the flexibility that we have here, in terms of needs assessment. Staying curious in inquiry or thinking about different ways.

So, I'm going to ask you to think about the tools and resources you already have in your program. So, first consider, does your curriculum offer guidance about science, math, these STEAM kind of topic areas? And the answer typically is going to be yes. Most, if not all, curriculums do offer some guidance around these important content areas. And so, what's more, many offer specific guidance about what teachers should be doing to promote science learning. So, we're going to look deeply at the curriculum first.

Kristin: So if I'm tracking, Kathleen, it sounds like needs assessment is pretty flexible.

Kathleen: It is. It's not necessarily that we have a lock-step set of needs assessment tools that teachers and coaches use. It's a way of approaching the work that you're doing and thinking about what you're already using in your program, what practices you want to see happening in your program, based on your curriculum or based on other guidance you have in your program, and then thinking about where teachers are in terms of those practices. And coaches use what they have.

So, let's look at an example to walk through that. So, here's an example from the HighScope preschool curriculum, which is used in some Head Start programs. So, this is just one part of one table on a single page of the science and technology book for HighScope. And you might have to do some digging to find a clear set of teaching practices laid out in your curriculum, but I bet they're there. So, you can take these "adults can" statements that we see up here -- adults can ask children to describe what happened, adults can encourage children to describe the different materials and actions they tried, et cetera -- and there you easily have a set of teaching practices upon which to help assess teachers' strengths and needs.

So, are teachers encouraging kids to recall what they did? Are they encouraging wondering what other children think when they investigate materials? So, you take these as a tool for you to use when you're

observing and beginning to think about where to start, or also a tool for teachers to think about where to start. And here's a second example. Other curricula have it laid out for you as well. And so, this is an example from the Creative Curriculum. There's a coach's guide to the Creative Curriculum that has components laid out for you, observing what you can observe when teachers are supporting science and social studies learning.

So, this is just an example from the Creative Curriculum Coach's Guide that shows what teachers might be doing: Provide objects that children can examine, describe, and measure. Right? So, are you seeing these practices happening in classrooms? And teachers can also self-reflect on these as well. Another option that we have in terms of thinking about setting goals and determining needs and strengths is thinking about, is scientific learning represented in teachers' intentional planning? So, that scientific method that I just walked you through, we can take a more fine-grained approach to see if teachers are being planful about those practices.

So, let's imagine that you've done the in-service suite on the scientific method. So, those slides that I just showed you, you've used those slides with your teachers, you've done some activities. And now you expect teachers to be very intentional about planning for scientific experiences. Think about those five steps of the scientific method, that process of thinking. If teachers want to use those practices in the classroom, they've got to be planful about them. Really skillful teachers, it feels like it's naturally happening in the moment. But it is also very planful. They're setting the stage for these really rich questions to be asked and they're being mindful about how they can help nurture children's predictions and help guide children through that process of experimenting. So, we want them to be planful about that.

And so, one approach you can take to needs assessment is asking yourself, is scientific learning represented in this deep kind of way in lesson plans? And so, does it go beyond planning activities, and do the lesson plans include the actual teaching practices that teachers are going to use? So, we might look for those five steps in the lesson planning process.

Kristin: So, Kathleen, this feels a little bit different to me. It sounds like, so the teacher's already started using the practices, and I'm curious how you decide which approach to take.

Kathleen: Right, here we're looking at something the teacher has already done. You've done the in-service suite, teachers are really excited about science in their planning, and we're assessing needs kind of in the moment rather than looking broadly at how teachers are implementing a broad set of teaching practices. So, it's really about knowing your teachers and where they are in the process and where you

are in terms of implementing your curriculum in a really mindful kind of way. So, it's just providing some options for thinking about kind of large-scale needs assessment -- is scientific teaching and teaching practices happening in classrooms--or more fine-grained—after conducting, say, an in-service suite, are teachers using those practices that we specifically talked about in a really planful way?

So, you can think about needs assessment depending on your context in some slightly different but complementary ways. It's really kind of big picture or small picture that we can think about that. Let's try out how we might work through after an in-service doing that scientific method in-service suite, okay? So, we have an activity that'll pop up. Okay, so let's imagine that you offered the in-service suite on the scientific method, like I just talked about, and staff members are excited and raring to go. And you're ready to put on your coaching hat and figure out who needs more support after the in-service. So, let's take a look at the lesson plan that you see here that Katrina turned in after the in-service. This is part of an activity that's in the in-service. So, she turned this in.

This is a template that's ready to go on the in-service suite. So, take a look at this, and then what part of the scientific method do you think Katrina might need more support around? So, which part might she not have thought through completely yet, and you want to be ready to have conversations with? And you can respond with more than one answer. So, just take a minute to fill that out.

Kristin: So, I'm taking a look here. It looks like we have several who are thinking Katrina might need some support around experiment in the scientific method. We've got some folks who are talking about observe, question and predict. Yep, we've got a few people who are thinking about questioning and predicting. A couple of discuss. Experiment seems to be-- seems to be the one that most are saying they're wondering about, although observe's coming in at a close second here. Okay. So, we've kind of come at a close here. Yep, experiment seems to be the top, and then we've got some folks who are saying observe, and we've got a little bit of a mixture for the other three areas. And if we go back to and look at the slide that's here, we can see that like a more thorough lesson plan that Katrina wrote after conferencing with her coach.So, let's imagine together how Katrina's coach used practice-based coaching to help get from the previous lesson plan to this one.

Kathleen: Yeah, great. And I'm sorry about that. So, yeah, we have this more kind of in-depth one. We saw in the poll that you all had voted in there that maybe there wasn't a lot of depth in Katrina's answers before, and some question marks even. So, she was admitting that she needed a little bit of support. So, many of you observed that Katrina might need support around experimenting and observing, and several of the other steps. She wasn't very specific about any step. And this shows she might not understand exactly what's being asked of her. She might be a little bit hesitant about the scientific process and how she can help children think scientifically.

So, let's take that example and imagine a conversation that Katrina and her coach might have about this needs assessment. Okay? So, I'm going to pretend that I am Coach Melissa and Kristin is going to be Katrina. So, thanks for sharing your lesson plan this week. It's such a great idea to spark the children's interest in insects. There certainly are a lot of them this time of year.

Kristin: I thought so, too. They're always finding worms on the sidewalk after it rains, so I thought we'd just run with it.

Kathleen: That's great. And I noticed you planned for that questioning and observation in your lesson plan. I'm curious about the other steps of the scientific method, though. Were those harder to fit in?

Kristin: They really were. I completely get following the children's interests and making the most of the moment, and I'm just not sure how to take this kind of spontaneous interaction and then work in predictions, experimenting, discussion. It just seems like a lot.

Kathleen: I hear what you're saying. It really, it can feel like a lot to take the children's kind of natural curiosity and then build in these intentional opportunities around it. So, how about we tweak the action plan that you wrote at the in-service meeting so we can work specifically on really digging in and planning those practices.

Kristin: That sounds great. Where do you think we should start?

Kathleen: So now we will segue to Katrina's action plan. And we don't need the text box there. It helps them see the screen. Thank you. All right, so here we see the action plan that Katrina and Melissa wrote that helped them get to a more intentional approach to science teaching.

And you might notice that it contains several different elements that were important for Katrina. And I'm looking specifically at the column on the left side, the steps to achieve this goal. Her goal was to use all five steps of the scientific method during science experiences. And so the steps on the left-hand side, you might notice that in step one, she has a chance to brainstorm ways to encourage prediction, experimentation, and discussion. And being prepared with simple phrases like, "Why do you think X happened? What do you notice about Y?" or, "I wonder what would happen if V?" are great reminders for her to plan for and model these steps of the scientific method. So, she can sit with a coach and brainstorm ways that she can guide children and encourage children to use this scientific way of thinking. And then, in step two, Katrina and Melissa made a plan to specifically work on her lesson plan. So, they can spend time together discussing and refining it until Katrina feels comfortable with her plan. This is an especially important way coaches can help teachers get ready to tackle content that they don't feel 100 percent knowledgeable or confident about.

Making a plan helps make it clear that science learning happens through simple interactions. It makes it a little bit less intimidating when teachers know experimenting means asking questions like, which do you think will grow faster or better, the plants with water or the plants without water? And they also

made a plan of how she'd be mindful about all the steps of the scientific process, so coming back at group time to discuss what they'd experimented on, et cetera, and going forward, discussing things with her team so everyone was on the same page as well. And so, we want to tie the loop on action planning here that we want to really think about what else might be topics of action plans. We saw Katrina's action plan. Take a second to think to yourself about other teaching practices you think teachers might consider including in an action plan.

And so here are a few examples of the specific practices that teachers might include as practices in an action plan, the topics. So, planning all parts of the scientific method in the lesson plan, like we saw with Katrina. Identifying natural opportunities to encourage exploration, and we'd go a little deeper into that in an action plan. Asking "how" and "why" questions. Asking children to predict what will happen next. Creating problems for children to solve. These are all topics and steps that can be included in an action plan when you're working with a teacher around scientific learning. Okay?

So, the next step in the practice-based coaching cycle is observation. So, let's watch Katrina try it out. As you're watching the short video that we have here, we'd like you to practice observing with a focus, and that is a focused observation. And so, you're looking for specific things while you're observing. Look specifically for the steps of the scientific method that we just talked about earlier, if Katrina is guiding children through the process of questioning, observing, predicting, experimenting, discussing. Is she repeating steps of it in a natural way as the children need?

And then, after the video, we'll have another chance for you indicate which steps of the process you saw. So, we're going to show you a video. We'd like you to practice taking notes on the specific questions you hear. So, if you hear Katrina ask questions, feel free to type them into the chat box or write them down on your own paper if you prefer.

And then be prepared to reflect on which parts of the scientific method you saw while you were conducting this focused observation.

[Video begins]

Child: It's a roly-poly.

Teacher: Because when you touch it, what does it do?

Child: Rolls up into a ball.

Teacher: I know! Should we try it? Can I try it?

Child: Use the tweezers.

Teacher: Yeah? Okay. Ready, Dalen?

Child: What you found, guys?

Teacher: Kyra found a roly-poly, and I'm going to see if I can make it go into a ball. Because she said if you touch it, it goes into a ball. And that's why they're called roly-polies, because they're going to roll. He doesn't want to come out. Ooh, I got it! Okay, let's see.

Child: Roll into the ball.

Child: Put it back in there.

Teacher: I will. Hold on. We'll look and see if he turns into a ball. Come on. Ball, please! Maybe, he'll listen to you.

Child: I see some --

Teacher: He tickles. His little legs are really soft. He tickles my hand. He even makes me jump.

Child: Maybe he will climb -- oh, no, don't fall off!

Teacher: It's going into a ball. Hold on, look at his legs.

Child: Like he's saying, "Hey, let me out!"

Child: He's rolled into a ball!

Teacher: Yeah, he is. That's why Kyra told me they're rolls, like -- what's the liquid stuff? What is the liquid?

Child: I found a spider.

[Video ends]

Kathleen: Great, so it looks like you noticed quite a few open-ended questions in there: Should we try it? Can I try it? What does it do? What's the liquid stuff? So, a few questions, lots of commenting in there as well. But a few questions to help kind of encourage this sense of discovery while the children are looking at this interesting insect on the playground. Okay? And you saw lots of questioning as part of the scientific method. Maybe a little bit of predicting in terms of kind of, can we make him roll into a ball? What'll happen when we touch him? Should we try it? Could be a little bit of experimenting. Might not be a fully kind of intentional kind of how could we test that out kind of stance on experimenting, but we're getting the beginning, the beginning of the scientific process here. So, I think we can definitely be clear there was lots of questioning, lots of observing, and a little bit of observing -- or predicting.

So, as coaches, we have this observation, and then we've got to take it a step further and be prepared to talk with the teacher about it and ensure that the teacher feels supported and gets feedback and the information that she needs. Great. So, what might you say to Katrina to encourage reflection? If this had been part of your observation and you know that Katrina has been working on the scientific method and really trying to think about how to encourage discovery about insects, what might you say to encourage reflection? And we have the chat box there, I see a few people have noticed, so chat in some responses for us.

All right, so I see quite a few reflection pieces that were similar to what we were thinking about. "How do you think your scientific exploration went today?" "Tell me about how the investigation of the roly-poly got started." Those kind of questions. You also pulled out, "How do you think that went? Did it go as planned?" And I think, I really appreciate, "How could you expand and scaffold what children already knew about roly-polies?" I appreciated, "Did it feel natural to you?" I think that's important if a teacher has been really hesitant or a little bit nervous, that we ask how it felt. "Did it feel more natural?" "Did this feel like something you would try again?" So those can be really supportive ways to help them reflect. "What about this was successful as part of the scientific method?" "What do you think would happen next if..." And I appreciated one question that really got at kind of the teacher's thinking about science. "So why do you think it rolls into a ball?"

So we could kind of even take a little bit of scientific -- model the scientific process with the teacher as well. So, nice reflective questions here, all open-ended questions that encourage the teacher to really think about what would happen, what went well, and how they could expand upon it. We also always want to remember when we're providing feedback as part of the practice-based coaching cycle that we have two kinds of feedback that are really important: supportive feedback and constructive feedback. And supportive feedback is feedback that acknowledges what went really well and what teaching practices the teacher used well.

So, take a minute and chat in in the box there what type of supportive feedback might you give to Katrina. All right, it looks like lots of folks are going to really encourage Katrina about her curiosity, about keeping the children engaged and following their lead, and that she really encouraged them to observe and explore. And so some specific pieces that you might say are, "I saw you down on the children's level exploring the bug with them." "You asked what they thought would happen when... X, Y, and Z." Or, "You gave them these really clear open-ended questions," if that's what you observed, "about what would happen if we set the roly-poly down, what happens when we touch it, what do you think will happen when..." And you can really encourage and give supportive feedback if you hear her using words from the scientific method: what do you predict will happen, or what's your best guess about what'll happen next, et cetera.

And the final piece is constructive feedback, which is feedback that's intended to help build skill or give suggestions or help teachers improve or refine their practices in some way. So, if you were working with Katrina, that type of constructive feedback might you give her? So, I see again many open-ended questions here as part of constructive feedback. "You used new words. What two more new vocabulary words could you introduce?" "Is there another way to get the roly-poly ball?" "Can you demonstrate?" And what you might also think about is "Next time, I would suggest..." and "What would be different if..."And I think the comment September has in the chat box about tying it back to the action plan is really very important. So, you might say something like, "Next time I'd think about using those starter phrases that we brainstormed in the action plan."

So, you might say, "What would happen if we try and move the roly-poly from my hand to Javier's hand? What would happen?" Or, "What do you think would happen if we set it on the ground?" Or, "I wonder if..." So, using words from the action plan, the phrases that we brainstormed, to give her some constructive feedback about things that maybe you didn't see or she could try differently next time. You might also say, "What would be different if we used words from the scientific method, like predict or observe." "Do you think children would understand those words?" Those kind of things, to really help tie the pieces all together for the teacher, with the teacher.

Kristin: So many ideas and strategies. I just, I'm sitting here, Kathleen, thank you again. So, much was shared by all today. There's a lot to think about when we're bringing the work all together, full circle. When we think about the scientific method, I mean, it's a process of scientific thinking. And we even saw live today how teachers help children ask questions about the world around them. They make those predictions about how things work, they observe, experiment, and test out their ideas, and then really come back to discuss, what did they discover?

And I think this process, I mean, it can happen in so many different ways and in so many different contexts. It can happen, we know, during a cooking activity, it can happen during free play on the playground, in the block area. It could happen while watching the class pet or even plants that children have planted in the classroom. Children are the greatest scientists out there, and teachers can really help them continue to understand the world around them by supporting this very process of thinking all throughout the day. And as coaches, and really thinking about our work with teachers, we recognize, too, that, bringing this full circle, all of our coaching is with the intention of increasing child learning, which is certainly a goal of the curriculum, too.

And as coaches, we can continue to really help teachers understand how child outcomes, curriculum, and professional development are all connected.

Kathleen: And so, we want to leave you with a few resources, as we do each month. And so, throughout this month's coaching call, you saw some excerpts from the 15-minute in-service suite on the scientific method. So, those are, of course, a resource that's available to you. And all of these resources will be on the follow-up document that will be coming out after the call. We also wanted to make sure that you were aware of an upcoming event specifically designed for teachers that you can encourage teachers, preschool teachers, to attend the Teacher Time broadcast call that's going to happen tomorrow that's going to focus on engineering in young children.

So, next month's Coaching Corner webinar is actually going to be a follow-up in some ways to this Teacher Time call. So, if you're interested in learning more about engineering or the teachers that you work with are interested more in building and engineering, that can be a great opportunity to recommend to them and then do some follow-up coaching around as well. We also want to make you aware of a new event that's happening next week.

It'll be our first practice-based coaching live chat. Myself and other members of our team will be on hand to answer questions you have about practice-based coaching or group coaching, like TLCs, teachers learning and collaborating, if you're familiar with that group coaching model, and other issues or concerns that you might have with coaching. We see it as a chance to really open up these two-way lines of communication and build our community of coaches. So, please feel free to join us. It'll be text-based, so you can drop by to see the questions and answers that have been submitted, share your own questions. You can feel free to stay for the full hour or as long as you would like. And an invite will come out to you in the next day or so about that event. And finally, the next Coaching Corner.

Kristin: Wonderful. Thank you so much, Kathleen, for sharing information to support coaching efforts around science teaching and learning. As we wrap up our time together today, we just want to thank all of you again for participating, and we certainly would want to invite you to join us for our next Coaching Corner webinar that's scheduled for March 19th. And we will be joined by Kristin Ainslie from the University of Washington. And, as Kathleen mentioned, our topic will be using practice-based coaching to support our young engineers and their teachers. So, thank you again, everybody, and enjoy the rest of your day.