

The Power of Questioning

By Wendy Cheong

Over the past four years, as part of the Teacher Learning Group, I have been exploring the role of questioning to advance inquiry skills in my second-grade classroom. When I started doing inquiry in my classroom, I allowed all questions the students asked to be investigated. I found, however, that having children do investigations based on all of their questions wasn't moving us toward the content, or some of the process skills, that I wanted to teach.

Over the past year, I have come to see that if I limit the questions to a manageable number like five or six, students maintain ownership over what they want to investigate, and we also move towards the content I need to cover. This intermediate step has been very helpful in getting me closer to my goal.

Getting started

I use district-adopted science kits in my classes. Before I start teaching a unit, I familiarize myself with the concepts of the kit and how the activities can support them. Over the years, however, I have moved away from teaching the lessons from the kit as described in the manual, and towards a combination of kit-learning experiences and more student-directed investigations.

When I use the sound kit from *Insights*, for example, I begin by choosing lessons that allow students to become familiar with the kit materials, become curious, and raise questions. I purposefully choose kit lessons that lend themselves well to exploration.

Modeling questioning

While watching the children explore, I encourage them to ask questions about whatever seems curious to them. Because students often have difficulty asking ques-

tions, I support them in various ways. For example, I model techniques and ask a lot of open-ended questions, such as: "Can you tell me what you are trying to find out with this instrument?" or "Is that what you expected to hear?" Eventually, the children get used to hearing the kinds of questions that can lead to investigations.

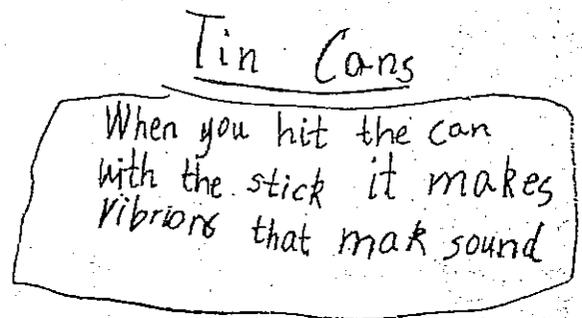
I practice active listening to the children's responses, since their questions often come in the form of statements. Then it's up to me, the teacher, to help turn their statements into investigation questions by asking things like "Do you mean . . . ?" or "Is this what you are asking?" I acknowledge and record all of their questions.

I always start by modeling how to ask questions that can be investigated, and eliminating or re-wording those that can't be investigated easily.

By inviting students into the process of recognizing questions that can be investigated, I find that I can help them to be better questioners, do investigations based on their questions, and get to the content I am responsible for teaching.

Constraining the question

After our classroom explorations with sound, the children generate a number of questions, many of which overlap in how they relate to the concepts. I have learned to constrain and refine these questions. I begin by grouping similar questions. If students ask 12 or 15 questions about a particular facet of sound, for instance, I do an intermediate step to collect the questions according to the concepts I



by Anton

Metel pipes

I know that when you hit the metel pipe it makes a ding-ding sound. Then you hear that sound. When you hit the metel pipe vibrations came out and make sounds.

by Anton

I train myself to look for at least one thing that I can bring to the whole group during discussion time.

know I need to teach. I work with the children to re-word some of the questions, and also give a lesson on how to sort questions into different groups. By working with the children we narrow those 12-15 mixed questions to about 4 or 5 more directed ones. This way, students still have ownership over the questions they can choose and investigate. In addition, I know I will be able to draw out the content and make it more meaningful, and the discussions children have at the end of their investigations are richer. Although they work on different questions, they discover many of the same concepts because the questions overlap.

Using this process, children become more self-reflective when they ask questions. They know what questions are, which ones will lead them to doing tests, which might be more like reference questions, and which can easily be answered with a "yes" or a "no." They also get a feel for which questions may be too big because we don't have the materials, or which questions may seem too difficult unless we can change them somehow.

Once we have the questions narrowed down, I give children their investigation criteria, which include working with a partner or two, choosing a question to investigate, and creating a plan and a materials list. The students write down their questions and how they will do their investigations, so they have a written form of what they are going to do on that day. Each group has a question, a plan, and a list of necessary materials.

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Doing the investigation

Before I begin an investigation, I train myself to look as I go through each group for at least one thing that I can bring to the whole group during discussion time. For example, I might find three common approaches for discovering the same idea. I would make a mental note of this observation and bring it up as a way to start the discussion: "Did that happen in your group?" I might say, or "Here's a technique that works well..."

While children do the investigation, I watch as demonstrations of particular concepts emerge. I use those pieces to ask probing questions during class discussions. I also use open-ended questions as a way to formatively assess what the children know while they are working on their investigations. This serves as a way for me to think about what I need to do for each child to take his or her own next steps.

Lessons learned

I did not always realize the power of questioning. These days, I see myself as a guide that helps the student's scaffold, re-word, and constrain their questions, to help move them towards knowing how to do independent investigations.

In a classroom of twenty second-graders, abilities are all different and children may not be able to understand the same things at the same times. Now I am able to reformat kit lessons that support both children's questions and the ability to move toward big ideas. I was not always sure how to use these kit experiences to connect concepts about sound for the children, but I predicted that questioning might help me to find a better way.

I think it is especially important to model for children their own reflection and to listen to their statements and help turn them into questions. I want my students to start to internalize this whole process and to look at their work in a more critical way. That way, they'll be able to think about their experiences and their learning, what they know and what they need to know next.