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Lights, Camera, Inquiry!: Setting the Stage for a Year of Inquiry

Brandon Schrauth

Setting the Stage for a Year of Inquiry

by **Brandon Schrauth**

ABSTRACT: This article describes my own inquiry. As I work to prepare and start a new school year. I show how I consider the classroom environment to have a strong connection to the success of inquiry in the science classroom. I describe how I use the process of inquiry as a starting point and how I use specific actions to create an environment that pushes students to move beyond restating known information. Finally, I address the need for a teacher's own change and the importance for our own risk-taking behaviors. *This article promotes National Science Education Content Standards A and B, and Iowa Teaching Standards 1, 3, 4, 5, and 6.*

Preparing for the start of a new school year is an exciting, busy, and anxious time. As August comes we begin to make lists, search for fun activities, and shop for new materials. I can remember that first year the students hadn't even arrived yet, and the walls were covered with posters, cutouts, and decorations. However, I now know the actions I take as I meet my new second-grade students are far more important than the actions I take to change the look of the classroom. It is important to create a community of learners that will support inquiry in the classroom. I realized the connection between the two after my own reflections and search for ways to make inquiry more effective in the classroom. This is important because students who learn through inquiry need to feel trusted, respected, and empowered as they work to construct knowledge (Kohn, 1996). As I strive to promote a classroom where inquiry flourishes I often grapple with many questions. These are just a few of those wonders…

- ***How can the classroom environment support thinking?***
- ***How can I encourage student thinking through my actions?***
- ***How can I support the development of content through inquiry?***

Brandon Schrauth has taught for five years at Walnut Hills Elementary School in the Waukee School District and has received recognition for his teaching with the "*My Favorite Teacher Award*" from Channel 5 News (WOI Des Moines) and the "*Golden Apple Award*" from Channel 13 News (WHO Des Moines).

In this article I will explain how I have begun to answer these questions. I will then highlight an inquiry that I use at the beginning of the year.

My main goals are for students to (1) engage in inquiry and begin to identify important scientific processes, and (2) continue to apply our community norms and behaviors in the content areas. Content will become more prominent as students' comfort with the processes of inquiry increases.

If students' initial science experiences are focused on investigation and exploration, they develop the ability to ask meaningful scientific questions, investigate aspects of the world around them, and use their observations to construct reasonable explanations for the questions posed (NRC, 1996). After these initial experiences, students will have background knowledge of the process of inquiry so that their focus can to the content they seek as they work within the curriculum I provide for them.

How can the classroom environment support thinking?

Through my own action research, I have identified a critical component that aids not only the management of my classroom, but my students' motivation, risk-taking behaviors, and creativity in the learning process. Building a classroom community takes time, energy, and a commitment for the entire school year. Community is not built the first week and then implemented throughout the year. I consider it to be like a ball of clay we shape and continually mold as we celebrate our success or face challenges.

Students that are part of a strong community are more likely to succeed academically (Goleman, 1997). In my own classroom I try to create a physical environment where students can meet in large groups, small groups, pairs, and as individuals. Desks are set up into groups, my desk is hidden away in a corner, and materials are accessible to all students in the room. The walls are empty but quickly fill as we develop structures in each of the content areas and learn together throughout the school year. I bring in pillows, lamps, and artifacts from my travels to make the physical environment more comfortable.

More importantly I try to leave as much undone as possible so that we construct "our" room together. The first week we will work together to set up and build our classroom. Students will organize materials, move furniture, and work together to form classroom routines and norms. As we work on the physical environment we are also working on the social and emotional environments. This is because a community is built around the shared interests, values, and goals of its members (Bickart, Jablon, & Dodge, 1999).

I use class meeting as the vehicle to develop the social and emotional environments. Class meetings are a time to share, decide, plan, and reflect (Kohn, 1996). In fact, class meetings are inquiries into both our own beliefs and the needs of the people we interact with at school each day.

This builds a physical, social, and emotional environment that is critical to the development of inquiry in the science classroom and beyond. The construction of meaning is an active process that can't be done unless the learner has substantial power to make decisions. (Kohn, 1996) Next, I will show you one activity I facilitate during the beginning stages of our science community.

How can the teacher support develop-ment of content through inquiry?

How can the teacher support thinking through their actions?

Launching the Inquiry

The students gather in the group area and we prepare to start.

"*We have been talking about what a scientist is and what a scientist does. Well, today is a very special day. Today and every day after today we are going to be like scientists.*" I want to communicate to students that today is special because the activities over the Next couple of days will establish a framework we will use the rest of the year. "*Now I want you to enjoy this, BUT it won't be easy. We found out from your drawings and our discussions that you think scientists have very important jobs. You will have a very important job this entire week as you work with your group to explore ice hands.*"

I am explicit in stating that while it will be enjoyable, the task will not be easy. Children will rise to the occasion when we provide challenges.

After posing my initial question I use several seconds of wait time. During this time I look expectantly from face to face, resisting the urge to call on those who already have their hands up. I do this to encourage others to continue thinking and to raise their hand when they are ready, knowing that my action promotes critical thinking as students are given time to think through their ideas. After a student shares an idea, I withhold making any comments, but instead again wait, perhaps 8 or 10 seconds, to further encourage students to think and share their ideas (Rowe, 1986).

My objective at this point in the school year is purely fostering classroom community and the inquiry process with students. The fact that I am using "ice hands" is not critical. This same framework could be applied to virtually any topic. I could have just as easily used colors and how they change when they are mixed together. This is normally how I started my year in kindergarten. I think we as teachers have to be careful to introduce the structures of science and then slowly bring in the content. In this way students have a framework to organize the content as they grapple with it.

I then show them a bag of ice. This gives the students a concrete representation of the idea we will address and is useful in helping some students activate their prior knowledge. Students will represent what they think they know about ice using pictures and words. I start this by stating, "*Think about what you know about ice*." Hands will shoot up. I remind them to put them down and think across their fingers. This encourages them to come up with a list of several things they think they might know.

As students work on this I am walking around the group area peeking in on their work. I then have students pair up with their assigned learning buddy and share their thoughts. I am listening in on the conversations for misconceptions or misunderstandings students may be holding on to. This will help guide my instruction with the hope that students will grapple with an idea or feel compelled to make a change in their current thinking. I am also very interested in students' ability to communicate with other scientists in our room.

At this early stage, discussion can often be a struggle. I remind myself of the value I will get in the area of classroom community development. We then create a chart that depicts the things we "think" we know about ice. During this time I am simply the recorder. It is critical that I do not judge students' prior knowledge. I simply say things like, "*So let me make sure I have this. You think ice is cold*?" or "*What do you mean*?" My non-verbal feedback is simply giving eye contact and modeling how interested I am. I work very hard to provide wait time before and after a child responds. This is critical because even in this early part of the school year discourse among students can occur if I provide this.

For example, Jaxson said he thinks ice floats. I recorded this on the chart and meanwhile I am waiting, waiting, waiting, and suddenly Logan says, "*What do you mean*?" This is exactly what I was hoping for. Now Jaxson has the opportunity to elaborate upon his thoughts. I end this day by saying, "*Scientists, I want you to look at our chart and I want you to think about all of the things we 'think' we know about ice. Think about something you aren't 100% sure about. Something you think might be the case but you really don't know for sure*." This is a great way for students to reflect and internalize what we just completed together. I join them in this. "*Turn to someone and tell him or her something you are not sure about*." I find students and talk with them about ideas I am unsure they have grasped.

Day 2

The weekend prior I had filled 12 latex gloves with water and tied the opening shut and placed them in the freezer. The next day I loaded them into my cooler and brought them to school. I have gathered 12 dishpans for each pair and a water pitcher. Later that day in science, we reviewed our list of things we "think" we know about ice. Students also have been asking me all day if it is science yet. "*Today, I am going to give each pair an ice hand.* (Excitement erupts!)

You will have a very important job as you work. Scientists, let's work to observe (create a

working definition for this word as some students may have never heard or used it before) *our ice hands. We won't stop there, I want you to also record the things you question or wonder about. I have a graphic organizer that will help you organize your thinking as you work* (Figure 1)." Each learning buddy has a role, one will collect the materials and the other will find their working location. I decided to have them work with just their learning buddy at this stage in the year because (1) this will encourage them to continue to build a bond with one specific student in the room, and (2) this directs them to spend more time working on the activity and less time working out group issues as we continue to build our community. I am monitoring student's movements and then dispersing the ice hands after I remove the latex glove. I place them into the empty dishpan and students begin their work. I walk around and confer with pairs. I am saying things like, "*Talk to me...*," "*What are you observing?*," "*What are you wondering?*" I remind students to record responses on their sheet as well. I encourage them to use pictures or words to communicate their thinking. I am searching for any misunderstandings or misconceptions because this will provide me with insight into students' prior knowledge and current thinking. After about 10-15 minutes, I dump a pitcher of water into the dishpan and walk away. This restarts the observations and questions. I again confer with pairs and ask them to elaborate upon their work. At this time I am also searching for a pair that is communicating their thoughts on their sheet in an explicit way. I may pause the investigation and announce to the class. "*Scientists, I want to stop you for one short minute. I notice that one group is drawing very detailed pictures and then drawing arrows to label their picture for their observations. You might try this too.*" I have found that doing this invites students to raise the expectations for themselves and shows them another way to record their thinking. I will then announce that I have a bin of tools that scientists use and welcome them to come and see if they will help them. I know that students do not know how to use all the tools but I want to give students an opportunity to explore using them before I explicitly model their use. The bin is filled with hand lenses, rulers, thermometers, eyedroppers, measuring tapes, and measuring cups. I continue to walk around the room and ask for elaboration or make suggestions such as, "*Since you observed _____, what do you think would happen if_____?*" This directs students to think beyond their observations.

Subsequent Days

We will review our questions and then students will form groups based on their interest in a particular question. They will work to plan their investigation with their groups. If there is a strong interest in one question, I will split the group up, because I want each group to contain no more than four students. Students will receive a sentence strip with their question and a piece of chart paper. They will discuss and record their plan to answer their question. Then they will illustrate the plan, list the materials they think they will need, list the steps, and record their predictions. I then meet with the group in a conference. My focus at this point is to make sure they have thought through their plan. If I notice that they may be setting up an unfair investigation, I do not correct them. Instead, I pose questions and nudge them to come to that realization themselves. If this happens I will make sure to highlight this to the class. This may aid other groups in considering the possibility as they work to collect data to answer their question.

What we observe...	What we wonder...

Figure 1. Graphic Organizer for students as they observe.

On the following day students will carry out their investigation with their materials and

record their results. The next task is to create a poster that displays their entire course of thinking. They will use this to communicate their results to their classmates in our "Science Conference," encouraging their classmates to learn about other inquiries as well as review the process that students went through to arrive at their inferences or conclusion.

Final thoughts

Implementing inquiry is not always easy and I often get to a spot in my preparation where I have more questions than answers. This is because often the students have the answers. If we remind ourselves to start with our students and not the curriculum guide we will succeed to a greater level with our students and ourselves. A classroom environment where thinking is valued provides support for the implementation of inquiry. It is important to be willing to take the risks alongside of students, knowing that every experience you plan will not necessarily be a success. Some thing I try to remember as I attempt new things is:

> "You take a Belly-Smacker because you're afraid to go headfirst, so at the last moment you pull your head up and then--smack!" (Reardon, 2002)

This quotation is my challenge to you as an educator, to not fall victim as a "belly smacker." As you work to set the stage for inquiry in your classroom you will initially encounter difficulties, but will do so in order to make a difference!

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