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**HOW HAS PARTICIPATING IN PROJECT FULCRUM IMPACTED YOU THIS YEAR?**

To quantify the impact, I must first determine where I began this year. The 2004-05 school year was the second for me as a sixth grade teacher in the district. Last year, 2003-04, had been one of transition with Lefler becoming a middle school and the adjustment anxiety and stress associated with a move to the climate of secondary school “almost”. Most of my energy was spent getting to know the routine and structure of middle school, adjusting to work with new colleagues, learning the sixth grade curriculum and learning to put grades on the computer and print out grade reports every three weeks.

I asked to teach science…. my favorite class of the day is science. However, science in the classroom of 2000s is a real challenge for me. My background as an “experienced” educator is one of teaching science without using a textbook. When I graduated from college in ’70, the “new thing” was process science. Students had been reading textbooks and not doing what we called “sciencing”. Districts got rid of the book, or relegated them to reference, and bought tubs of equipment for hands-on learning. I was on the Wichita, KS district science committee, presented activities at KATS (Kansas Association of teachers of Science), and loved teaching science in my 5th grade classroom. I did not worry about content…I taught concepts. Some of my favorites were density of liquids, changes, gases in the air, behavior of animals (we did mealworms), and environments. Students learned by doing the processes of science. Assessment was done by setting up and performing experiments, collecting data, and drawing conclusions. For parent’s night, students had their parents experiment with four mystery liquids and make an up and downness chart to determine their density. By the end of sixth grade, students knew how to make observations, how to test for variables, how to set up experiments and controls, how to collect data, and how to draw conclusions…they probably could not answer 40 multiple-choice questions over a
science topic. I do not know. I never tested them over facts...they wrote answers to essay questions for assessments. My science experiences were fantastic.

From Wichita, I moved to Independence, KS, a small town in southeastern Kansas, and taught upper elementary for 5 years. There I was the “extra” teacher that taught combination grades out in a portable. I was basically alone teaching the “smart” kids that no one wanted in their rooms...today they would be labeled as gifted and BD gifted. Science was not especially stressed in this district and they did not have the money for equipment and curriculum guidance. I made up my own science, pulling the best from my past experiences. Science was not as successful, however, because the students came to my room without a previous background in using the scientific method. I had to teach them the basics. I did not have materials at my fingertips, and found myself scrambling to find the right tools all by myself. As a result, science received less time in the classroom. I spent most of my time on social studies. Making change jars (studying molds), density of liquids, and the human body unit were my most successful science memories of this period of my teaching career.

Then I moved to Lincoln, NE in 1987. Our daughter was in kindergarten when we moved and I chose to be a stay-at-home mom...”sort-of”. I became a mentor for highly gifted students, especially BD gifted, at Humann Elementary, just down the street from our house. I did that job for 10 years. It was a great job for a science person. Most of the time I helped students do research on topics or projects of their own interest...and many times that interest was science. We grew crystals, programmed computers, entered the statistics competition, investigated questions, wrote stories based on science theory similar to those of Michael Creighton, researched fractals, and the list goes on. My past experience of doing science with no text was quite helpful because I did not need to have materials in order to investigate questions...we just made our own, or tried out ideas. Many times we just started with observations that lead to a project. Assessment was usually an oral or Hyperstudio presentation of the project for the students’ classmates and parents.

This brings me to the present. It is now my third year in returning to the classroom. When I was given the science book, it was very unsettling. I paged through, looking at all the facts and information as a voice said, “The students are expected to pass
a multiple choice test (CRT) on all this information at the end of the unit.” This was, and still is rather difficult for me. For the first time in my life I had to teach content for a test. I had no trouble knowing the content; it was just teaching it by using experimentation, planning for two forty-minute periods, and finding time to get everything prepared. When I went to the summer science camp for sixth grade teachers, I was rather lost since I had never taught, nor seen the materials before…but it looked “fun”. As the year progressed, the “fun” vanished as I tried to juggle learning facts with learning the “sciencing” of science, as I knew it. I felt my students were learning a jumble of things. I’m not sure they knew what science really was when they left my classroom. When the year ended, I made it a priority to organize science first…I was so frustrated with teaching the subject I loved the most.

When the opportunity to join Project Fulcrum was presented, I initially did not want to give up every Tuesday evening to meetings. I had so much to do, but I had experienced fantastic assistance at Everett Elementary from Project Fulcrum scientists and thought maybe science teaching would be easier if I could collaborate with some other teachers. I would not have to do everything alone, so I signed up.

For me, being rather new to sixth grade, the grade level meetings were invaluable. I was eager to try some of the things that I had not done the year before, just because I needed a bit of a “push” or some “tips” on what works best. Everyone had ideas, and the Fulcrum scientists had unique inquiry ideas ready to go. They were not intimidated by the materials, or afraid to try it out with students. Having the extra support made it easier for me to spend energy with greater focus. The quarter calendars with the weekly unit objectives made by a Fulcrum scientist were a great resource guide. It helped keep me on pace and see at a glance how the unit was progressing.

Fulcrum scientists could help design activities and bring materials not available in our classrooms to teach some of those abstract concepts such as static electricity and air pressure. My students never really understood these last year, but this year they can make a connection. It is so much easier to teach the vocabulary when it is “real”, not to
mention having two scientists doing presentations by asking each other questions, and then doing an experiment to find out the answer.

The scientist I worked with was skilled with making data sheets for lab experiments and organizing data on overheads for processing with the students. That was something I just had no time to accomplish. He was able to complete a power point review of the first unit using some of his personal pictures gathered while rock climbing, with vocabulary and questions. It was an effective tool, and students paid attention.

Working with a scientist in the classroom made it possible to work with small groups. By doing this, students could ask more questions, receive personal attention, work with the materials longer, and generally be involved in experiencing science. As a teacher, I could learn more about the students that were quiet in the large group…they were less intimidated in a small group setting. Small group instruction helped our classes bond as a group.

Without Project Fulcrum, I would have never seen the importance of bringing science role models to the classroom. I don’t believe I ever saw that as part of my science teaching. It was never stressed or encouraged as part of my instructional classes. Of course, bringing in a speaker to share expert information, but not for the express purpose of telling about themselves and what they love doing as a scientist. Having scientists in my classroom students knew and trusted, made science personal and definitely not as “intellectual or scary”. The scientists made mistakes, and not everything was perfect, but that’s science. Mistakes are what lead to discoveries. Students saw the science of “now”, and could dream or set goals for the future.

I was able to find answers to most of my questions or have my scientist find someone who could help us when we needed something. I am good at ideas, but not always good at figuring out implementation. It was great to have another opinion because I tend to want to do too much. Just because it was a “fun” activity did not always translate into something of valuable science for the amount of time. My Project Fulcrum scientist helped me clarify “the waters” because he was looking from a different perspective.
Project Fulcrum also made me assess and update my philosophy toward teaching science in the classroom. I am still trying to clarify the difference in inquiry vs. process, and evaluate teaching by inquiry vs. direct instruction. Being the “experienced” member of the group this year, I did find it interesting to listen to the younger teachers talk about not worrying about the CRT. They wanted to teach with inquiry and not be so concerned by all the facts. This sounds so familiar to my first classes in education when it was just “not right” to teach all those facts and have students never “doing” science. Then we progressed to so much “doing” that no one was learning facts, just having “fun”. Now that is out of vogue, and today we are “proving” by scientific research that we need to do both.

As I was doing some Internet research on inquiry (which I never would have done had I not attended Project Fulcrum meetings)…there it was…a lesson plan on density. I was fascinated because that was one of my favorite relics of the past as I have mentioned before. What was different? Interwoven into almost the same lesson was the deliberate teaching of more scientific facts and connections to real-life than I had taught in the past. The lesson was filled with questions and opportunities for students to respond with guided and student-designed experimentation. Granted it was for middle school students instead of elementary, however, it had won an award for being a great inquiry lesson. They still were using mystery liquids, making stacks of liquids, asking questions, collecting data, devising experiments, and controlling variables. I felt a bit more comfortable that once upon a time I had done as some form of inquiry, not just “prescription activities” that were discarded junk.

I still remained one of the frustrated ones until we discussed inquiry on a scale, and that some things lend themselves to more inquiry than others. I felt much better about my science teaching. I am convinced that students need both…they need to learn how to read, process, and take tests on non-fiction information and they need to know how to question, discover answers, and then ask more questions by using the scientific method.

How to teach it all in a balanced way is the question. Our discussions about assessment helped me become more balanced. I started a science notebook and asked essay questions for daily work. That helped me know what students understood about the
topic so I could reteach, or just engage in a dialogue with the student. When students’
designed their own magnet investigations with the help of my Fulcrum scientist, their
conclusions were often vague or not substantiated by their data. I would write questions
and they would write back. Students looked forward to my notes. Some students asked
to do additional experiments to retest their final conclusion, or try something else when
they realized what they said was not proven.

Through Project Fulcrum I have become more deliberate in sharing science as a
discipline and modeling scientific methods as I teach science classes. The responsibility
is rather awesome when I realized that what students experience in my classroom IS
science, as they know it. I am more confident to defend my teaching methods, more
open to finding what’s best for students rather than easiest for me, and committed to the
research and practice of adding more inquiry to my classroom instructional palette.

DESCRIBE HOW PARTICIPATING IN PROJECT FULCRUM WILL CHANGE
YOUR PRACTICE FOR NEXT YEAR? WHAT ARE YOU PLANNING TO DO
DIFFERENTLY THAN THIS YEAR?

Through Project Fulcrum I have been able to begin to organize certain experiences I want
for my science students next year. I am then going to spend time this summer planning
where to put them into the curriculum where they will be most effective.

My list includes:
Revise at least one experiment from each unit to add more inquiry
Students plan own experiments using scientific method (maybe magnets, digestion, soils)
Focus mini-lessons on scientific method (like mini-lessons on six traits)
Using scientists as role models with image of a scientist project-this is a MUST
Finding science news (providing newspaper science section each week to student)
Use Project Fulcrum equipment and scientists for demonstrations (air pressure and static electricity)

Use science notebooks, or something similar, all year to determine what students understand and to converse with them about science

Students write responses to science news…how does it apply to real-life

Start an afterschool science club at Lefler for 6th graders…would need Project Fulcrum assistance

Work on simplifying my tests and adding more thinking and “explain” questions

Work on making a power point for each unit review with vocabulary based on Tim Perrin’s model

Work up power point presentations for subjects that interest kids (national parks and clouds, glaciers, storms, motors)

Choose one experiment for each unit that involves collecting and analyzing data…using math skills for a real purpose to draw conclusions

One thing I want to do throughout the year is allow time for students to ask and answer questions. I did well with having students write questions, but some units we did not get around to answering them. One way is putting them in groups and having the groups answer them after studying the unit. Then we could post the other unanswered questions for a scientist or students to investigate. I need to start this right away when school begins, then it will be more comfortable as the year goes on. Maybe students will be more interested in adding questions if they are posted.

I also need to connect my students to the first unit on the earth. It has been more difficult to teach because so few of my students have been places or observed rocks. They know all about amusement parks, but not much about the land around them. I want to bring more photos and maybe find a good video that gives an overview of famous national parks. Having a scientist in the classroom like Tim with his rock climbing hobby and personal photos made the unit seem to have a real-life application. Maybe this is the unit I could do role models…if I could find scientists excited about the earth, students might
start out more interested in science for the entire year. Electricity and magnets are naturally fun for students, and the human body and weather are everyday connections for them, but the first unit is abstract.

Project Fulcrum has made me more aware of expressing science as the future. I speak more often to the students about things they will discover in their lifetime, or problems they will solve and try to bring in articles about science. When I was in school, every week we read about the newest advances in science with the Weekly Reader. Now it is not part of the program, or cost prohibitive. To make it happen, I will need to plan for it by making a student responsible for news with papers or magazines I provide, or bringing young scientists to the classroom. Of all the subjects, science is the one that best lends itself to advancements that are tangible. New innovations in science, health, and technology are a way of life, but few of my students read newspapers or listen to the news. The excitement of the “science of now”, not just the “science of books” is part of the world I want my students to experience as sixth graders next year.

Project Fulcrum has also made me want to do too much in the short amount of time we have for science each day. From my experience in the program, I am more aware of how to use resources and time wisely so that students can experience inquiry and take more ownership of the learning that takes place in science class. It is a quite a task to manage and organize that which appears spontaneous. Having observed others, or had a scientist to “show me how”, opened up some doors that I would have thought too hard to open. Through my experience in Project Fulcrum, I want to share with others in my building and help open doors for them, even if they are only cracks.