Rocky Mountain Middle School Science & Mathematics Project
2005

Change in the Practice of One Teacher

Michelle Calcote teaches science to sixth graders at Second Creek, a K-8 school, within the Brighton 27J district, one of the partner districts in the Rocky Mountain Middle School Science and Mathematics Project (RMMSSMP). She completed two professional development courses provided through the RMMSSMP during 2005. Both courses, *Cells, Human Systems, & Heredity* and *Interactions of Elements & Compounds,* began with summer content intensives and concluded with "structured follow-up" applications held during the fall. As Michelle describes her enthusiasm for her learning and its application for her students, her words accelerate as she speaks.

Michelle is in her second year of having "her own science classroom." Her journey to teaching began with a bachelor's degree in exercise and sports and a master's degree in educational counseling. She is currently enrolled in the second year of a Teacher-in-Residence program (a two-year alternative teacher licensure program). Concurrently, she has begun a second master's degree in science as a direct result of the courses she so enthusiastically embraces through the RMMSSMP. She intends "to take two science or mathematics instruction courses per cycle for as long as the grant-funded opportunity exists."

First, her depth of knowledge in science content has increased. Although she successfully completed a college major in chemistry 6 – 8 years ago, she felt that she had forgotten some of the content because she had not immediately used it in her work. She reports that she is absorbing the new content "just like a sponge" and feels more current in science content. Her confidence has grown to the point that she believes that she could teach secondary science with success.

In addition, Michelle has applied nearly every new pedagogical concept learned this year with her sixth graders. The students "love and learn from" the *kitchen experiments* (those experiments that require only easily available and inexpensive products). For example, students learn about absorption processes in membranes when they dissolve the membrane of eggs in different solutions during their biology unit. "My students wouldn't be able to see the membrane of a cell, but they can see similar processes by observing the membrane of an egg." Sixth graders "love surprising sounds produced by experiments with air pressure." One *kitchen experiment* requires that a pop can is heated and then submerged in ice resulting in rapid decompression. The students learn about temperature as a factor in air pressure, and they giggle when they hear the sound produced. Her students have completed "all" of the *kitchen experiments* as part of their biology or chemistry unit.

The inquiry approach to teaching science has resulted in greater depth of student learning. During the biology unit of instruction, "I never thought that my students could understand cellular structure to the degree that they have demonstrated." During the chemistry unit, "I posed the question: *What is matter?*'' "I showed them how matter changes in response to different chemical or temperature factors." However, I never <u>gave</u> the answer to: "What is matter?" The implication of Michelle's description of her instruction was that her students gained a greater depth of understanding when they had to think about an essential question.

As a science teacher, Michelle had not previously connected with her obligation to teach literacy as a part of science instruction. She said that she didn't really know how literacy could be taught in a science class. As a direct result of the instruction in integrating literacy into science provided by Sharon Wood, one of the members of the *Interactions of Elements & Compounds* instructional team, Michelle began to introduce students to the textbook, model for them how to take notes, teach them to read for information, and highlight vocabulary relevant to the current lesson.

As a part of Michelle's participation in the Teacher-in-Residence program, she is assigned a mentor. Her mentor, Aaron Tate who also teaches science at Second Creek, completed the same RMMSSMP courses with her. They are using a form of a "professional learning community" process to promote Michelle's professional learning as a new teacher as well as continuously improve both teachers' instruction. They provide support to each other in planning units which results in "more detailed and thoughtful lessons." As Michelle explained, her teaching style is "on the expressive side." Her mentor's style is more "content-based." We complement each other in comparing approaches for more balance of instruction in both of our classes.

Finally, Michelle believes that the 'Project came along at the perfect time for her own career. "I didn't have any *old* habits to overcome."

For those teachers who are considering becoming involved in the Rocky Mountain Middle School Math and Science Partnership professional development courses and wish to ask Michelle questions, she may be reached at mcalcote@brightonps27j.k12.co.us.