

## Clarke N. Johnsen Junior High School

2152 N. 400 W.

Tooele, UT 84074

Principal: Hal Strain

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Clarke N. Johnsen Junior High School is a new school in the Tooele County School District, drawing the overflow from the other county junior high school. It opened in fall 2006. The student body is primarily Caucasian (87%), and approximately one-third high poverty. Although the school is located relatively near a large city, Salt Lake City, it operates more as a rural than suburban school. The families tend to be affiliated with the local area rather than Salt Lake City.

- ◆ Junior High (7-8)
- ◆ 87% Caucasian
- ◆ 52% Female Students
- ◆ 31% Free or Reduced-Price Lunch

Opening a new school with new faculty and facilities gave the principal, Hal Strain, an opportunity to set direction. He wanted to encourage girls in math and science, and began that process by bringing the Math, Engineering, Science Achievement (MESA) coordinator from the old to the new school as one of Johnsen's four science teachers. He also recruited three other experienced female science teachers. The teachers then took the lead in setting up the science program, specifically focusing lessons and activities on encouraging girls.

The principal set the schoolwide goal of encouraging girls in science, brought in teachers with the interest, experience, and skills to make it happen, and then provided support as needed. However, the teachers are the primary drivers of the school's activities to support girls in science. The principal supports innovative instruction and other efforts to engage girls in science with what he calls "a loose-tight relationship. We're very loose on how teachers accomplish what they need to accomplish, but we're very tight in control on what needs to be accomplished. And so we've given the teachers...our goals that we have as a school and what...we'd like to accomplish...we encourage our teachers to use their imagination and to be creative on how they'd like to accomplish those schoolwide goals."

The four science teachers deliberately set themselves up as role models for the girls in their classes, wearing lab coats and talking about their experiences studying science in college and as professional scientists. According to the principal, "[The teachers are] good role models for success in the math and science areas. I think it's very important for these students to have a role model inside the school that they can look at and say... 'I can relate to this person, and look at how successful, how intelligent, and how personable they can be to me.' I think that's a real driving factor in education."

The Johnsen science teachers also share other female role models with their students, by discussing famous women scientists in class and bringing in female scientists as speakers and to work with the class on projects. While the teachers are deliberate about showing students female scientists as role models, they integrate the message in lessons focused primarily on science content. For example, rather than discussing female scientists as the primary focus of a single science unit, they mention prominent female scientists, including those who may never have gotten full credit for their work, as relevant throughout the year. Thus, the idea of women being involved in science is a constant but subtle message.

The teachers work with the students to explore their career options, deliberately and sometimes explicitly asking them to think beyond traditional gender roles. For example, one teacher asked her students to pick a science career they might like to pursue, and describe it. She did not accept the idea that only boys could do science. In that lesson, the teacher focused on factors such as personal interest that should influence career decisions.

Science lessons are planned to catch the interest of all students. Teachers organize group projects, hands-on activities, open-ended exploration, and other strategies to engage students in the content. The teachers develop lessons in which students are expected to solve a problem, using the scientific processes and tools they have learned in class. For example, they might be asked to create an environment that would be conducive for a certain type of animal, given their prior work on habitats and biology. Or they might be asked to determine what can and cannot be changed about a piece of bread, using their skills in measurement and weight and their knowledge of mass and volume. Students share their findings, and rediscover basic scientific principles.

The teachers also deliberately plan lessons to build on girls' interest. For example, one teacher built a chemistry lesson around dyeing Barbie's hair. Another teacher had her students explore classification systems by designing and justifying their designs for a shopping mall.

In lessons such as these, according to the principal, "the teacher had these kids on the edge of their seats...I see these teachers giving these students opportunities to actually take part in their education as opposed to listen to a teacher try to teach them. And I think when students are given the opportunity to have a part in their education and to actually physically see why something works and to experience what's being talked about, can be a very powerful tool for these students to get that spark in their education and for these students to want to continue in that subject."

The MESA coordinator, Cheryl Dearing, sets up activities outside of the classroom to draw students, especially girls, to science. For example, the MESA program has a monthly after-school meeting, in which students participate in a science exploration activity. The school also is actively involved in many regional activities, some supported by MESA and some supported by the school or district. For example, the school participates in annual field trips to a Women in Science Career Fair, the Science Olympiad, an engineering fair geared towards girls, and other related outings.

Again, the school supports the teachers' outside-the-classroom efforts. According to the principal, "[W]e've given both time and resources to different programs such as MESA and the Science Olympiad. We've allowed these teachers to get these young ladies and young men in touch with science applications outside of the classroom. We've brought in some speakers from the community who are successful female scientists or mathematicians and they use the science or math in their careers and the kids see this, they see a successful role model and it gives them a little bit of encouragement in that area as well."

Together, Clarke N. Johnsen's strategies for encouraging girls in science seem to work. The majority of the advanced classes and most of the after-school science clubs are made up of girls, according to the principal, because the girls have seen and followed the lead of the strong female role models in their science teachers. Some of the students in the after-school science clubs had not engaged in school at all until they connected to the science teachers and activities. According to the principal, "I could see that they were excited about what they were doing...I think what these after-school programs have done for a lot of these students is it's given them a connection to the school and it's sparked an interest, an interest that they didn't know they had...The teachers are encouraging the students and when the students get that spark, they're encouraging each other."