ST. VRAIN VALLEY SCHOOLS
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High School Science Daily "Look-Fors"

Guiding Question: ***Who is doing the talking, the thinking, and the science in the classroom?***

Daily Look-Fors (*Making the Shift to 3 Dimensional Science Instruction*)

- **Teachers start each science unit with a unit phenomenon** or problem or question.
- Lessons should be based around students' experiences, their culture, and their community. (This is designed to engage students as active learners)
- **Students ask questions that drive the learning**. (This should be recorded on a classroom DQB, Driving Question Board)
- When prompted, students should be able to tell what they are doing for that day, make connections to the phenomena, and relate what they are learning to real-world problems. (See the Student Interview Section below)
- Students use their own language when conducting an activity and before science specific vocabulary is introduced (conceptual understanding).
- **Students are "DOING" science** using Scientific and Engineering Practices (SEPs) to make sense of a phenomenon.
- **Students are engaged in discourse** as they make sense of the science versus the teacher telling students the answers.

Science and Engineering Practices *(What students should be doing… figuring out rather than just simply learning about) Which practices are observed?*

- Asking Questions
- Planning and Carrying out Investigations
- Using Mathematics and Computational Thinking
- Developing and Using Models
- Analyzing and Interpreting Data
- Constructing Explanations
- Engaging in Argument from Evidence
- Obtaining, Evaluating and Communication Information

Student Interviews *(When you have the opportunity ask a student…)*

- What are you doing today? Why are you doing this?
- How does what you are doing relate to the questions your class has?
- How are you and your class keeping track of what you are figuring out in this unit? (students should be using the class DQB and student notebooks)

What can principals do to support implementation?

- Focus on what the students are doing first and then think about what the teacher has designed to make that happen.
- Engage teachers on how the three dimensions are incorporated into lessons.

AN OVERVIEW FOR PRINCIPALS

The purpose of this document is to introduce principals to the NEW Colorado Science Standards and provide a general overview of the key instructional and conceptual shifts required by their teachers.

A major difference between the NEW Colorado Science Standards and previous standards is the inclusion of "three-dimensional" (3D) learning. 3D learning refers to the thoughtful and deliberate integration of three distinct dimensions: **Disciplinary Core Ideas** (What students need to know), **Scientific and Engineering Practices** (What Students will Do), and **Crosscutting Concepts** (How students should think about science connections).

Through 3D learning, these NEW standards emphasize that science is not just a series of isolated facts and represent a fundamental shift in science education and require a different approach to teaching science than has been done in the past. Looking ahead, teachers can use a range of strategies to engage students and create opportunities to demonstrate their thinking and learning.

How will science education change with these NEW Standards?

Science education will involve less:

1. Learning of ideas disconnected from questions about phenomena
2. Teachers providing information to the whole class
3. Teachers posing questions with only one right answer
4. Student reading textbooks and answering questions at the end of each chapter
5. Worksheets
6. Oversimplification of activities for students who are perceived to be "less able" to do science and engineering

Science education will involve more:

1. Systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned
2. Students conducting investigations, solving problems, and engaging in discussions with teacher guidance
3. Students discussing open-ended questions that focus on the strength of the evidence used to generate claims
4. Students reading multiple sources and developing summaries of information
5. Student writing of journals, reports, posters, and media presentations that offer explanations and arguments
6. Provision of supports so that *all* students can engage in sophisticated science and engineering practices

The numbered information above is from: National Research Council. (2015). Guide to Implementing the Next Generation Science Standards. Committee on Guidance on Implementing the Next Generation Science Standards. Board on Science Education, Division of Behavioral and Social Sciences and Education, Washington, DC: The National Academies Press.

St Vrain High School Science Unit Plans - These are professional growth documents as much as instructional road maps. They include all hands-on labs and simulation connections.

Making the Shift to 3D Science Instruction - Evaluation continuums for teachers to use in guiding and monitoring their shift to 3D science instruction.