

Make improvements across the curriculum

While many districts across the country have reduced the amount of time spent in science in an effort to increase student performance in other tested subjects, studies of students involved in an active, high-quality science program are showing improvements across the curriculum. In El Centro, California, teachers who implemented an inquiry science program supported by science notebooks saw gains in science, mathematics, reading and writing after four years (Amaral, Garrison, & Klentschy, 2002).

Science notebooks are a compilation of entries that provide a written record of the experiences a student had from the science curriculum (Ruiz-Primo, 2001). They provide a place for students to engage in scientific thinking and document concepts they are learning. They are a place where students hone their writing skills to formulate and refine questions, make predictions, record data, describe procedures, compose reflections and communicate results.

Gains in student performance from the use of

science notebooks are attributed in part to increased practice in writing, but much of the improvement has to do with the type of writing in which the students are engaged. Effective use of science notebooks is based on a model of writing that includes claims and evidence statements (Magnusson & Palincsar, 2003). This kind of writing provides a rich form of formative assessment data for teachers to tailor instruction to meet student needs.

Though there is much research still to be done, we offer the following recommendations:

- Make notebooks purposeful. Explicitly connect the writing to scientific investigations and new learning to maintain student engagement.
- Center the science notebooks on authentic tasks such as researching, analyzing, and evaluating.
- Keep most of the writing descriptive or narrative. These entries provide tremendous insight into what students understand.
- Use the notebooks to help student understand not only what they learn, but how they learn.

WASL Ready?

Use of science notebooks by every student, in every school, every day improves achievement in reading, writing, and science for *all* students.

-Amaral, Garrison, and Klentschy, 2002.

Port Angeles School District

In Port Angeles, principals and Teacher Leaders are learning about science notebooks together. Teacher Leaders are teaming up in grade bands to deliver a “mini lessons” at monthly Leadership Team meetings. Each lesson will communicate the science notebook strategies being used at each grade band, K-12.

During these mini-lessons the principals will be immersed in a science notebook experience where they will put together their own science notebook. This experience will familiarize principals with the components of science notebooks and develop their understanding of notebook “entry types” and other writing opportunities. In the end all the Leadership Team members will take away their own complete science notebook that contains a representation of the notebook practices occurring at each grade level within the district.

Questions to Consider

- ❖ What would you like to know about science notebook practices or other writing strategies being used in the district?
- ❖ What would you expect to see in a student’s science notebooks as evidence of learning?
- ❖ How can you create structured opportunities for Teacher Leaders and Principals to learn together?

Burlington Edison School District

The Burlington-Edison Science Leadership Team has completed their Preferred VISION for a Comprehensive Science Program (<http://files.esd189.org/~jjohnson/LASER/VisionScienceBE.doc>). According to Tracy Dabbs, Science and Technology TOSA, “Both NCOSP and LASER have made it possible to visualize using science as a means to improved communication, literacy and math skills for all students.”

Part of the plan includes the “Application of Skills within the Science Content”, which calls for students to not only develop reading and math skills, but also to use writing to reflect and share, communicate effectively, and develop critical thinking skills. In some cases students will use their science notebooks to demonstrate their learning. The district created scoring guides for science notebooks so students are clear on what it means to meet standards. Professional development is underway to help staff ensure that students succeed.

Questions to Consider

- ❖ What is your district vision for science education?
- ❖ How is science supporting communication, literacy and mathematics learning in your district?
- ❖ How are rubrics or scoring guides used to help administrators, teachers, and students understand the standards?



North Cascades and Olympic Science Partnership

Carolyn Landel
carolyn.landel@wwu.edu



Northwest Education Service District 189

Joanne Johnson
jjohnson@esd189.org



Olympic Education Service District 114

Rosemary Ziara
rziara@oesd.wednet.edu



Washington State LASER

Sonia Siegel-Vexler
sonia_siegelvexler@pacsci.org



Calendar of upcoming events

- Jan 11 LASER Instructional Materials Showcase, Seattle, 8:30 – 4:00 (LASER)
- Jan 12 NCOSP Learning Community Forum, WWU Viking Union, 9:00 – 3:00 (NCOSP)
- Jan 19 NCOSP Learning Community Forum, Port Angeles Red Lion Inn, 9:00 – 3:00 (NCOSP)
- Jan 25 Science Powerful Classroom Assessments, Everett, 5:30 – 8:30 (ESD189)
- Jan 26 STC-MS Energy Machines and Motion Initial Use Training, Port Townsend, 8:00 – 3:00 (ESD114)
- Jan 31 STC-MS Magnets and Motors Initial Use Training, Ferndale, 8:30 – 3:30 (ESD189)
- Feb 6 Science Notebooks Training, Mount Vernon, 4:00 – 7:00 (ESD189)
- Feb 9 STC-MS Catastrophic Events Initial Use Training, Sequim, 8:00 – 3:00 (ESD114)

Key references and resources

- Amaral, O.M., Garrison, L., & Klentschy, M. (2002). "Helping English Learners increase achievement through inquiry-based science instruction" *Bilingual Research Journal* 26(2):213-239.
- Magnusson, S.J., & Palincsar, A.S. (2003). "A theoretical framework for the development of second had investigation of texts." Paper presented at the American Educational Research Association Conference. Chicago.
- Ruiz-Primo, M.A., Li, M., & Shavelson, R.J. (2001). "Looking into students' science notebooks: What do teachers do with them?". National Center for Research on Evaluation and Student Testing.
www.stanford.edu/dept/SUSE/SEAL/Reports_Papers/Cresst2001No2.pdf

Science notebooks website: www.sciencenotebooks.org