

Bronx River Fieldwork and Math-Science Notebooks

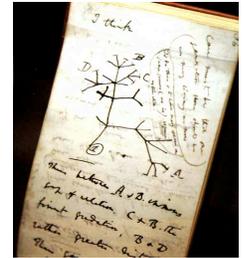
NYAS “Science Slam”

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Using Math–Science Notebooks to Find Out About Students’ Learning

Ideas and vocabulary —

- What are students thinking?
- Are they using new language and ideas in appropriate ways?



Organization —

- Are students organizing information logically and in a variety of ways?
- Are the organizational structures **meaningful and clear to students and others**? Do they make sense and include appropriate units, labels, and scales?

Meaning and personal ownership —

- How are students using notebooks to make sense of their learning experiences?
- Are students using and sharing their own ways to organize, make sense of, and record information? Examples: tables, charts, graphs, diagrams, inserts, tabs...
- Are students making sense of the content and making personal connections to prior knowledge, self, world, other subjects, other class content?
- Are students recording their own “mental mastication”—their wonderings, questions, thoughts, and observations?

Resources:

The following are resources that we have found useful – although they are more specific to science, our use of notebooks in math evolved from our use of science notebooks. Many are focused on lower grades, but are very applicable to high school.

“**Student-Centered Notebooks**”, by Brian Campbell and Lori Fulton, *NSTA Science and Children*, November/December 2004, p. 26-29
An excellent article about facilitating student ownership of their notebooks and making them personally meaningful to students

Science Notebooks: Writing About Inquiry, by Brian Campbell and Lori Fulton, 2003, Heinemann
Probably the single best book on implementing and using science notebooks

Writing in Science, by Betsy Rupp Fulwiler, 2007, Heinemann
Just what the title says

Writing to Learn Mathematics, by Joan Countryman, 1992, Heinemann
Excellent book for using writing to teach mathematics

“**Five Good Reasons to Use Science Notebooks**”, by Joan Gilbert and Marleen Kotelman, *NSTA Science and Children*, November/December 2005, p. 28-32
A great article about reasons to use science notebooks and how to maximize benefits

Outdoor Inquiries, by Patricia McGlashan, Kristen Gasser, Peter Dow, David Hartney, Bill Rogers, 2007, Heinemann
Resource for taking science investigations outside of the classroom

I See What You Mean, by Steve Moline, 1995, Stenhouse
provides many ideas in developing visual literacy, including graphs, tables, charts, and graphic organizers

Science Notebooking Website

<http://www.sciencenotebooks.org>

“The purpose of this website is to support classroom teachers in their quest to use science notebooks in their classroom.”

Tucson Unified School District Science Resource Center

<http://instech.tusd.k12.az.us/Science/src.html>

This website’s “Using Science Notebooks” has a lot of information and data about the value of science notebooks.

An Example Lab Book, by Harrison, D. M. (2003, October 10), from University of Toronto Web site:

<http://faraday.physics.utoronto.ca/GeneralInterest/Harrison/AzumaBook/Azuma.html>

This website’s describes a real scientist’s notebook and how it is used, aimed at university students, it is very interesting. Includes images of real notebook entries.

Tips for Starting Out:

Starting

- Start your own notebook and see how you use it
- Start small – use mini notebooks for an investigation, lab, or project
- How will you begin? What experiences will provide students with meaningful starting points for writing?

Logistics – Think about how students will use notebooks

- What type of notebook will they use?
- What kinds of entries?
- What recording strategies will you teach students to use and how will you introduce and practice them? (Lists, tables graphs, drawings, writing, symbols...)
- How will you assess student progress? Will the notebooks be graded?
- How will you provide feedback to students?
- How will you address/prevent a lost notebook?

Ownership and Meaning

- Encourage students to put anything they want in their notebooks, keep them open-ended.
- It’s OK to require certain things, but encourage personal expression, experimentation, including use of color, taping in objects, etc.
- As a teacher, try not to write directly in notebooks – use post-its, or other inserts that students can remove. (This respects student’s work and encourages ownership of the notebooks and their work in them)
- Encourage students use their notebooks as resources
- Provide regular opportunities for students to make sense of content and leaning experiences by writing about them

Contact Information:

If you have questions about notebooks, the assignments, prompts, how to start, etc...

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Many resources/ getting started guide available at:

<http://groups.google.com/group/notebook-geizing/web/resources-getting-started>
(a google group I started around using notebooks)