

Frequently Asked Questions about Science Notebooks

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Q1. What are the benefits of using science notebooks in teaching?

- Science notebooks are a good record of what content is taught and learned and provide good ongoing assessment and feedback tools for teachers (Ruiz-Primo, 2002).
- When used with inquiry-based science programs, science notebooks have led to significant gains in student achievement (Klentschy et al, 2004).
- Science notebooks help organize and enhance science instruction by establishing a regular protocol for recording and analyzing data and ideas.
- Students get better at writing by writing, so the use of science notebooks helps support developing literacy skills (Scardamalia and Bereiter, 1986).
- Notebooks can help students link new learning to old learning (Rivard, 1994), and helps them socially construct their knowledge (Vygotsky 1978; Shephardson and Britsch, 2001).
- Writing regularly in notebooks can help students develop their abilities to think about their own thinking (metacognition) which aids in understanding and long term retention. (White and Frederickson, 1998).
- Writing and using notebooks regularly helps promote a classroom culture of learning.

Q2. Why don't more teachers use notebooks? What concerns might they have that

prevent this practice?

- Many teachers are not sure how to incorporate notebooks in their science teaching, perhaps due to confusion regarding competing approaches, concerns at amount of effort required; or procedural issues, such as students losing notebooks, or managing the notebook process, or evaluating/grading notebooks.
- The LAB-AIDS notebook provides built in structure and guidance (with LAB-LOG and graph-anywhere pages), but almost any notebook will work better than none at all.
- SEPUP teachers in the Midwest noticed some of the highest scores on the unit post-test after integrating science notebooks in their teaching; when they went back to their standard practice (and discontinued notebook use) they noticed declines in end of unit post-test scores.

Q3. What about other types of notebooks? By that I mean, bound vs. spiral, 3-ring looseleaf, etc.

- There are advantages to each type. In bound notebooks, it is not easy to remove individual pages. On the other hand, it is easy to remove (and use) pages in spiral notebooks. If students were behaving like scientists, what type of unit would they use? The notebook is not a glossy final product, it is a work-in-progress.

Q4. What does it mean to "set up the notebook?"

- You can never start soon enough. The format for SEPUP notebooks generally contain the following elements: table of contents, numbered (and dated) pages, appendices (these can contain scoring guides, glossary, etc.) and individual activity layouts, including title, challenge question (sometimes called key

question or essential question), key words, materials, procedure, data, analysis questions, reflections, and more.

Q5. What other type of formats are you seeing teachers use? What are the strengths of each?

- Interactive formats, with left and right space/pages reserved for student and teacher input. Teachers can look at the student input as they walk around the room. This works well for getting at student misconceptions.
- Some teachers use sticky notes instead of writing directly into the student side of the journal, to maintain student ownership.

Q6. How can using science notebooks actually make the class run smoother?

- Using notebooks gives a predictable protocol for students working in class; for example, students begin on the “getting started” question as they enter the class, and know what they are supposed to do at different points in the lesson as these are all keyed to the notebook entries – getting materials, following a procedure, answering analysis questions, etc.
- Students work at their own pace and if some students progress more rapidly through the lesson, they are not held back, waiting for others to finish. Similarly, the structure helps students working more slowly (or not at all) to work more rapidly and become more independent of teacher help.
- Using notebooks elevates the class discourse as students can discuss the evidence they collect in class. They are more engaged in the business of science, in gathering data and thinking about the science, which is shared later on in the lesson. The fact that students know their responses will be shared also increases their participation and focus. On task behavior generally improves.

Q7. There is a lot of interest around the practice of "teaching bell to bell," not wasting class time. How can notebooks help this?

- Students need time to write a thoughtful response. If you don't give them time to think and write, how can you object to poorly written responses? There is often a fair amount of "transition time" that often seems unstructured or off-task. The journal is a meaningful use of class time. Writing in the journal makes it important.
- Using the notebooks gives a focus point, so that if equipment is put away, students can spend any additional time working on the analysis or "white space" questions (see the LAB-LOG columns for this).

Q8. How do you manage and evaluate student notebooks, do you have any suggestions for making this more efficient?

- Notebook quizzes can be helpful, these are done on an as-needed basis, and questions can draw on content, procedure, or a combination of the two. Almost anything in the notebook could be the object of a quiz, so it gives students incentive to keep theirs up to date – or they could lose points!
- Much of the analysis can be informal, can be done as teachers move about the room as they monitor student performance and progress.
- Students inventory their notebook, or might even make time for peer evaluation, to be followed up with a teacher conference.

Q9. How can using science notebooks actually enhance student learning, including support for literacy and DI?

- Students develop expository writing skills, including different types of writing, each of which can be a focus: descriptive, procedural, narrative, explanatory and persuasive.
- Students practice writing and drawing, use color to highlight important concepts.
- Increases student engagement – students find it hard to write unless they are actually engaged in what they are doing and thinking about.
- Interactive notebooks support struggling writers, who may balk at formal writing assignments as well as gifted students, who want to do more.
- Teachers can observe "learning in the making" by looking at journals, giving a snapshot of learning (vocabulary, conceptual understanding) over time.
- To support ELL students, they can practice writing in small doses; language learning is grounded in the writing about their in-class experiences.
- Allows students to work at their own level.
- Accommodations for special education students (e.g., giving copy of data table) and gifted (extensions) -- the notebook is never "done," there is always more to do.

Q10. How do you assess student learning using science notebooks?

- Notebooks can foster teacher collaboration, as teachers compare notebooks from different students.
- Notebooks make thinking visible, teachers can leaf through the journal to see how learning unfolds.

- Students can provide more formal work products (lab reports, projects, directed writings, etc.) based on work in their journals. This is something I can take home and mark; I wouldn't necessarily take home 150 journals.

11. How can teachers learn more about using notebooks in their science teaching?

You can find more information about our work with science notebooks at www.lab-aidsinstitute.com/notebooks. Additional information from the NSTA website can be found at

<http://www.nsta.org/store/search.aspx?action=quicksearch&text=science%20notebooks&gl=0&sid=0>.

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