



Continuing Science at Home, with Science Notebooks

What is the issue?

A scientific notebook has been used as a tool for centuries, to capture observations, develop questions and progress towards sense-making. Consider assigning students daily or weekly science notebooking opportunities as part of their at-home learning. These can be synchronous or asynchronous opportunities for students to share how they are making sense of science concepts outside of the classroom. How can science notebooks be leveraged as a tool to explicitly engage in science & engineering practices as well as the crosscutting concepts?

Family/Community Connections

Take advantage of this opportunity to encourage learners to see science in their space. How might cooking connect with the content you are covering? Observing the sky and weather could be a family activity. Students can capture images of science concepts as represented in their communities and homes. This could be a way we honor learning from multiple environments in support of sensemaking across all ages.

This effort represents the collective work of a group of individuals including, but not limited to science education leaders representing the Council of State Science Supervisors and NSELA. Resource Contributors (listed in alphabetical order): Lizette Burks, Linda Cook, Maya Garcia, Mike Heinz, K. Hillary Paul Metcalf, Renae Pullen, Kathy Renfrew, Meg Richard, and Tricia Shelton. Special thanks to Meg Richard, Linda Cook, and Hillary Paul Metcalf for their work on "Continuing Science at Home, with Science Notebooking".

Implementation

While there is no universal layout or template for a science notebook, (as each scientific discipline and researcher approaches them differently), this tool aims to support users in incorporating notebooks into a home or remote setting. The following themes are common across disciplines and could be utilized to support students notebooking remotely.

Ask Questions

Pick a phenomenon. It could be indoors or outdoors, made of cells or not, designed by humans or not. After students observe it, have them use thinking tools brainstorming or mind mapping to identify connections in thinking prior to researching. Question prompts might be: What do you notice? What do you wonder? What else would you want to know about it?

Model

If students draw observations, remind students to make the drawings Accurate, Big, Colorful, Detailed. See tips for Sketching. Encourage field scientists to leave plenty of room for drawings, additions, and revisions of data and ideas. When modeling, encourage students to add features like arrows, and color-coding to better show/explain their ideas.

Investigate

Students choose researchable or investigable questions to guide next steps. Students collect and organize data.

Reflect / Revise

Students reflect upon their new learning and show evidence of their revised thinking. Student explanations and revisions may occur orally, using drawings, or in writing.

Elementary Examples:

Observe the parts of either a plant or animal in your yard. (1-LS1, 4-LS1, 5-LS1)
Observe how different shoes move on a rug, on tile, on linoleum, wood, etc. when pushed. (3-PS2)
Investigate the components of the ecosystem under the porch or in the backyard. (2-LS2.A, 5-LS2.A)
Investigate how the sound moves from the TV to the room. (4-PS4.A, 1-PS4.C, 4-PS3-C)

Secondary Examples:

Observe how the organisms interact on a notice and wonder walk. (MS-LS2.A, HS-LS2.A)
Record observations of the same object sliding down slopes with different angles. (MS-PS2.A, HS-PS2-A)
Citizen science projects like those found at Zooniverse

Strategic Tips

● ELA Connections

Use science notebooks to encourage learners to write more frequently. Students can record their observations, develop arguments based on evidence, and summarize their observations over time. Improving disciplinary literacy in science serves to strengthen learning across multiple disciplines.

● Math Connections

Students will have the opportunity to compare the sizes of objects, measure and record information, and apply calculations to things they are seeing in the real world. Students can use the data or they collect in their notebooks to reason mathematically or as evidence to support a claim.

Tech to Try

- **Seesaw**- an online journaling tool, that allows students to take and annotate pictures, make videos, and type information.
- **FlipGrid**- this Microsoft tool could be used as a daily digital journal, or as a way for students to see and experience phenomena in a variety of ways.
- **Science Journal App**-use Science Journal by Google to help students design and conduct their own investigations
- **VoiceThread**
Ed.VoiceThread is an online environment for students to record their thinking in a controlled, accountable, and transparent setting.

Additional Resources:

- ★ [NGSS Phenomena blog](#)
- ★ [Science Notebook Corner](#)
- ★ [I am Keeping a Field Journal](#)
- ★ [Notice & Wonder Walks](#)