Science Practices Continuum - Supervision

This continuum is intended for teachers and administrators to use in guiding and evaluating science practice-based instruction. The levels reflect increasingly sophisticated instruction of the practices and are not grade-level specific; teachers of K-8 students can teach in developmentally appropriate ways at any of these levels. Appendix F in the NGSS provides significantly more detail for each practice (that should be integrated as both students and teachers develop greater fluency with each practice). The practices are grouped into the "Investigating" "Sensemaking" and "Critiquing" practices.

		Level 1	Level 2	Level 3	Level 4
Investigating Practices	1. **Asking questions**	Teacher does not provide opportunities for students to ask questions.	Teacher provides opportunities for students to ask questions. Students' questions are *not typically scientific questions* (i.e., not answerable through the gathering of evidence or about the natural world).	Teacher provides opportunities for students to ask questions. Students' questions are both *scientific* and *non-scientific* questions.	Teacher provides opportunities for students to ask questions. Students' questions are typically *scientific* (i.e. answerable through gathering evidence about the natural world).
	3. **Planning and carrying out investigations**	Teacher does not provide opportunities for students to design or conduct investigations.	Teacher provides opportunities for students to conduct investigations, but these opportunities are typically *teacher-driven*. Students do *not* make decisions about experimental variables or investigational methods (e.g. number of trials).	Teacher provides opportunities for students to *design or conduct* investigations to gather data. These opportunities enable students to make decisions about experimental variables, controls and investigational methods (e.g. number of trials).	Teacher provides opportunities for students to *design and conduct* investigations to gather data. These opportunities enable *students to make decisions* about experimental variables, controls and investigational methods (e.g. number of trials).
	5. **Using mathematics and computational thinking**	Teacher does not provide opportunities for students to use mathematical skills (i.e., measuring, comparing, estimating) or concepts (i.e., ratios).	Teacher provides opportunities for students to use mathematical skills or concepts but these are *not connected* to answering a scientific question.	Teacher provides opportunities for students to use mathematical skills or concepts that are connected to *answering a scientific question.*	Teacher provides opportunities for students to *make decisions* about what mathematical skills or concepts to use. Students use mathematical skills or concepts to answer a scientific question.

Sensemaking Practices	4. **Analyzing and interpreting data**	Teacher does not provide opportunities for students to analyze data. Students may record data, but do not analyze it.	Teacher provides opportunities for students to work with data, which could include organizing or grouping the data. However, these opportunities *do not* support students in *recognizing patterns or relationships* in the natural world.	Teacher provides opportunities for students to work with data to organize or group the data in a table or graph. These opportunities support students in making sense of data by *recognizing patterns or relationships* in the natural world.	Teacher provides opportunities for students to *make decisions* about how to analyze data (e.g. table or graph) and work with the data to create the representation. Students make sense of data by *recognizing patterns or relationships* in the natural world.
	6. **Constructing explanations**	Teacher does not provide opportunities for students to create scientific explanations.	Teacher provides opportunities for students to create scientific explanations but students' explanations are *descriptive* instead of explaining how or why a phenomenon occurs. Students *do not* use appropriate evidence to support their explanations.	Teacher provides opportunities for students to construct explanations that focus on explaining *how or why a phenomenon* occurs. Students *do not* use appropriate evidence to support their explanations.	Teacher provides opportunities for students to construct explanations that focus on explaining *how or why a phenomenon occurs* and *use appropriate evidence* to support their explanations.
	2. **Developing and using models**	Teacher does not provide opportunities for students to create models.	Teacher provides opportunities for students to create models. Students' models focus on *describing* natural phenomena rather than predicting or explaining the natural world. Students *do not evaluate* the merits and limitations of the model.	Teacher provides opportunities for students to create models focused on *predicting or explaining* the natural world. Students *do not evaluate* the merits and limitations of the model.	Teacher provides opportunities for students to create models focused on *predicting or explaining* the natural world. Students *do evaluate* the merits and limitations of the model.

Critiquing Practices	7. **Engaging in argument from evidence**	Teacher does not provide opportunities for students to engage in argumentation.	Teacher provides opportunities for students to engage in argumentation where they support their *claims with evidence or reasoning*, but the discourse is primarily *teacher-driven*.	Teacher provides opportunities for students to engage in *student-driven argumentation.* The student discourse includes *evidence and reasoning* to support their claim. Students also agree and disagree, but rarely engage in critique.	Teacher provides opportunities for students to engage in *student-driven argumentation*. The student discourse includes evidence, reasoning that links the evidence to their claim, and *critique* of competing arguments during which students build on and question each other's ideas.
	8. **Obtaining, evaluating, and communicating information**	Teacher does not provide opportunities for students to read text for scientific information.	Teacher provides opportunities for students to *obtain* scientific information, but *do not evaluate* this information. Students also *do not* compare or combine information from multiple texts considering the strengths of the information and sources.	Teacher provides opportunities for students to *read and evaluate* text to obtain scientific information. Students *do not* compare or combine information from multiple texts considering the strengths of the information and sources.	Teacher provides opportunities for students to *read and evaluate* text to obtain scientific information. Students *compare and combine* information from multiple texts considering the strengths of the information and sources.
	Classroom Culture Prioritizing Science Practices				
	Less ----------More				
	Connected to the Natural World Focused on Scientific Evidence Student Directed and Collaborative Informed by Critique				