Disciplinary Literacy in Science

By: State Science Education Coordinating Committee | Nov 2023

BACKGROUND

What is disciplinary literacy in science?
Disciplinary literacy in science is attending to how people read, write, speak, and listen (communicate) in the various disciplines of science. Scientists communicate in many different ways such as figures, graphs, charts, and words. They also utilize different genres of text such as articles, scientific journals, and field notes to gather and communicate information. In discourse, scientists use specific patterns such as argumentation and construction of explanations.

In the past, educators used general literacy skills such as graphic organizers, comprehension strategies, and vocabulary acquisition to teach science. While helpful, these general literacy skills are not sufficient to support students in becoming literate in science. Science disciplinary literacy needs to be explicitly scaffolded for students to develop their capacity to communicate authentically in science.

Why is disciplinary literacy important in three-dimensional science instruction?
By being intentional about developing disciplinary literacy in science, students learn to communicate within the scientific community. This gives students access to participate fully as a member of society and prepares them for college or careers in science if they so choose.

CLASSROOM APPLICATION

When observing a classroom that supports disciplinary literacy in science, the following **student and teacher actions** should be visible:

Reading:

- Students read a variety of types and genres of texts that are authentic to science: figures, graphs, tables, captions, models, textbooks, articles, blogs, field journals.
- Students read to gather information to support sensemaking of phenomena.
- Teachers scaffold students' ability to read multiple types and genres of text.

Writing:

- Students write a variety of types and genres of text that are authentic to science: figures, charts, models, articles, field notes, journal.
- Students write to authentically communicate as they engage in science and engineering practices: engaging in argument, constructing explanations, developing models, planning investigations.
- Teachers scaffold students' ability to write multiple types and genres of text.

Speaking and Listening:

- Students are engaged in authentic discourse to promote sensemaking of phenomena.
- Students use discourse to evaluate texts, claims, models, experimental designs, and support ideas with evidence and reasoning.
- Students actively listen and respond to classmates' ideas.
- Teachers structure discourse opportunities using a variety of grouping strategies: pairs, small groups, whole class
- Teachers scaffold discourse between students using crosscutting concepts, questioning, sentence frames, and meaningful science tasks.

IMPLEMENTATION RUBRIC

Basic	Emerging	Effective	Exceptional
Students are speaking, listening, reading, and writing for non-scientific purposes using non-scientific types and genres of text.	Students are speaking, listening, reading, and writing using authentic science types and genres of text; however, students use the texts for non-scientific purposes such as answering questions on a worksheets, identifying main ideas in passages, or practicing comprehension strategies.	Students are speaking, listening, reading, and writing using authentic science types and genres of text for scientific purposes to gather or communicate information using science and engineering practices and scientific ways of thinking: crosscutting concepts.	Students engage in speaking, listening, reading and writing as they actively select appropriate science and engineering practices and crosscutting concepts to help them gather, reason, evaluate, and communicate about a phenomenon using authentic science discourse as well as types and genres of science text.

RESOURCES

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- Disciplinary Literacy in Utah Schools
- Reading, Writing, and Thinking Like a Scientist
- CSD's Instructional Guide on Disciplinary Literacy p. 119-120
- Content Area and Disciplinary Literacy