

Supporting Literacy Capacities of Speaking and Listening

By Page Keeley

There is strong agreement among elementary teachers that science provides an engaging, authentic context for reciprocal learning in both literacy and science. Integrating science and literacy can ensure that science has a firmer foothold in the elementary curriculum. This integration typically involves embedding reading and writing activities into science investigations and curricular units. However, the literacy capacities used in science require teachers to attend to more than just integrating reading and writing into science. As shown in Figure 1, literacy integration in science also involves speaking and listening.

At first glance, this figure looks like a list of component practices taken from *A Framework for K–12 Science Education* (NRC 2012) or the *Next Generation Science Standards* (NGSS Lead States 2013). Indeed, these are practices used

in science, especially in argumentation; however, this list was taken from the *Common Core Literacy Standards* for speaking and listening (NGAC and CC-SSO 2010). Whether or not your state adopted the *Common Core*, most states have similar expectations in language literacy for speaking and listening.

When considering the integration of science and literacy, students should have opportunities to use the full range of literacy capacities—reading, writing, speaking, and listening. When formative assessment probes are used in a discussion format, they not only help students think through, share, and examine others’ ideas, they also help students develop speaking and listening skills.

For example, first and second graders can be seen on a video discussing ideas similar to the Solids, Liquids, and Gases formative assessment probe (Figure 2, Keeley and Cooper 2019). In this video, which can be viewed at www.learner.org/courses/essential/physicalsci/session1/index.html, the students are talking about the concept of matter, deciding which things are considered matter, and coming up with criteria to decide if something is matter or not matter. The students are using productive talk to make a claim—supported by evi-

dence—of whether a solid, liquid, or gas is matter. The students express their ideas clearly and persuasively. They listen attentively so that they can respectfully disagree or build upon others’ ideas. They are using language to work together as a collaborative group to make meaning out of the concept of matter. Here are some excerpts from their discussion:

“Basically, it’s stuff you can see and touch. Not matter is something you can’t see and touch, like air is not matter.”

“It’s something you have to have like air. We can’t live without it.”

Teacher: “So what we breathe out, is that matter?”

“Only in the winter because you can see it but not necessarily feel it.”

“Yes, it is matter because you can feel it when you breathe out like this.” [Student blows on his hand.]

“I would think it has to be something solid, not like salt though. It has to be something you can actually hold.”

“You have to be able to hold it and what you breathe out isn’t like that.”

Teacher: “Is water matter?”

“You can see it even though it’s hard to see. Like if you are taking a bath you can see your body under the water. You can feel it. I think it’s matter.”

“I think it’s matter because you can see it and feel it and you can hold it when it is ice. When it’s ice it is solid.”

Now examine the list of speaking and listening skills shown in Figure

FIGURE 1

Literacy integration.

- Construct effective arguments ★ request clarification
- ★ ask relevant questions ★ build on others’ ideas ★
- articulate their own ideas ★ question assumptions
- and premises ★ assess the veracity of claims ★ assess
- the soundness of reasoning ★ cite specific evidence ★
- make their reasoning clear ★ constructively evaluate
- others’ use of evidence ★ evaluate other points of
- view critically and constructively ★ express and listen
- carefully to ideas ★ cite specific textual evidence to
- support conclusions ★ participate effectively in a
- range of conversations and collaborations with
- diverse partners ★ build on others’ ideas and express
- their own clearly and persuasively

1. Notice how many of these literacy skills, such as constructing effective arguments, citing specific evidence, making their reasoning clear, building on others' ideas and expressing their own clearly and persuasively, are used during a productive science discussion. Not only are these important skills for language literacy, they are also skills that make up the scientific practices of argumentation and communication.

Using the formative assessment probes in discussion formats provides students with the opportunity to develop and use the language literacy capacities of speaking and listening within the scientific practice of argumentation. The natural synergy between speaking, listening, and sense-making supports all students in sharing and evaluating their ideas, using productive language, and developing understandings of scientific concepts and phenomena. As for the teacher, giving students the opportunity to develop, use, and strengthen their speaking and listening skills when discussing a formative assessment probe, provides a big window into students' thinking. This information about individual and whole-class thinking is then used to make better instructional decisions or to provide feedback to students.

There is one important caveat. The norms of productive discussions as seen in this video do not develop automatically. Teachers need to build a culture of productive, respectful talk in the classroom, especially when discussing ideas about the phenomena or concepts in a formative assessment probe. This takes time and planning by the teacher and practice by students, but the effort is well worth it. Two excellent resources for supporting classroom talk in the elementary science classroom are the Talk Science Project at <https://inquiryproject.terc.edu> and the STEM Teaching Tools Practice Brief #6: How Can I Get My Students to

FIGURE 2

Solids, liquids, and gases.

Who do you agree with the most? _____ Explain why you agree.

Learn Science By Productively Talking with Each Other? at <http://stemteachingtools.org/brief/6>. Each of these resources will help you effectively integrate the literacy capacities of speaking and listening when you engage your students in probe discussions. ●

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