

As nearly anyone who has tried to learn a foreign language has discovered, it can be uncomfortable to use language in a new and unfamiliar manner. The discomfort keeps language learners from interacting with others in ways that can lead to proficiency. The same can happen for students trying out scientific language in the classroom. How can we change this?

Word Wall Work: Supporting Science Talk

By Tracy L. Coskie and Kimberly J. Davis

Scientists do their work as part of a community. One characteristic of that community is that it shares a way of using language. Over time, scientists have developed specific terminology to pinpoint the ideas they are sharing. They've also developed ways of talking about their investigations so that others can learn from, challenge, and extend their results. Being able to participate in the discourse is how individuals begin to view themselves as participating members of the scientific community.

Just as scientists develop an identity that includes particular terminology and particular ways of using language, the children in classrooms develop an identity around academic language. We know that in order for children to be successful in school they must be capable of coping with academic language—the language of science and mathematics and social studies, for example (Gee 2004). Classroom talk is an important way in which children learn the language and content of the disciplines. As Winokur and Worth (2006) note, “language is a critical ingredient for developing the necessary scientific reasoning and conceptual understanding” (p. 45).

One goal of classroom teachers is for students to develop the ability to recognize and understand the vocabulary of science. Classroom teachers also understand that students “need to keep expanding their understanding of scientific terminology so that they move from recognition of terms to full ownership of them” (McKee and Ogle 2005, p. 57). In order for students to develop full ownership of the language of science, they must have frequent opportunities to use it.

This lesson is designed to put a common classroom

tool—the word wall—to new use, giving teachers and students support for making scientific language a regular part of their classroom community. Teachers and students can work together to build a science word wall during any unit (including content and process words, new words and known words). Encourage students to use the words when they are engaging in discussion and when they are planning for, reporting on, or explaining the results of investigations.

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References

- Gee, J.P. 2004. Language in the science classroom: Academic social languages as the heart of school-based literacy. In *Crossing borders: Literacy and science instruction*, ed. E.W. Saul, pp. 13–32. Newark, DE: International Reading Association/NSTA.
- McKee, J., and D. Ogle. 2005. *Integrating instruction: Literacy and science*. New York: The Guildford Press.
- Winokur, J., and K. Worth. 2006. Talk in the science classroom: Looking at what students and teachers need to know and be able to do. In *Linking science and literacy in the K–8 classroom*, eds. R. Douglas, M.P. Klentschy, K. Worth, and W. Binder, pp. 43–58. Arlington, VA: NSTA Press.

Using a Science Word Wall

How do scientists propose investigations?

Objectives:

- To use specific vocabulary to share scientific thinking
- To communicate scientific ideas clearly
- To propose an investigation

Process Skill:

Communication

Grade Level: 3–6

Prepare

As you begin a science unit, introduce students to the science word wall. When you introduce the word wall, it should have a few words with which students are already familiar from previous units. For example if the unit were on earth materials, you might start with the words *observe*, *describe*, and *rock*. As students have an opportunity to explore materials and conduct teacher-led investigations, both teachers and students should add words to the science word wall. In the example unit, students or teachers might suggest adding *properties*, *evidence*, and *hardness* among other words (See Figure 1). When students are ready to conduct their own investigation, this lesson can help them make a proposal.

Engage

Tell students that since they have already had a chance to study some concepts in the unit, today they are going to work with a partner to propose an idea for their own investigation. Explain that they should use their materials and their notebooks to come up with an idea for their investigation. Then they should use the word wall to prepare a statement for the class that describes the plan. You might model for students, for example, by saying, “For my investigation, I will *observe* and *record* the *properties* of five *rocks* or *minerals* and *compare* them in a chart.” The teacher might then ask students which of the word wall words she included in her proposal.

Explore

After giving partners time to plan their investigation and practice how they will present their idea to the class, call everyone together. Remind students that this is their chance to try using scientific language and that their job is to help each other figure out the best way to explain their investigation proposal. As partners state their plan, teachers and fellow students should point out the ways they have included scientific language in order to provide positive feedback. Students who struggle should be given support. For example, they might explain their idea and have classmates use the word wall to try to put the idea into scientific language for them. Then the partners can restate their idea.

Discuss

Talk with students about why it might be important to use specific words and phrases as they talk about their scientific investigations. Why do they think scientists use particular vocabulary? Ask students to share their experience trying to use the vocabulary to propose their investigation. What was challenging? What could

Materials:

For the class:

- Large chart containing list of scientific vocabulary for the unit

For individual students:

- Science notebooks and other materials from the unit



Figure 1.

Sample word wall for Earth materials unit.

Observe	Mass	Feldspar	
Record	Color	Calcite	
Test	Hardness	Fluorite	
Properties	Mixture	Gypsum	
Compare	Acid	Rock	
Dissolve	Granite	Mineral	 
Evidence	Mica	Crystal	 

begin or continue using scientific language. English language learners, for example, might benefit from sentence starters that can be posted alongside the word wall. If teachers note that their students find this activity particularly challenging, they might take a few minutes before or after each science session to give students a chance to practice describing their investigations using the word wall. Teachers can also encourage students to use the word wall as they are in

they do to make it easier to use the vocabulary in the future? Point out the important ways they are already using science language in their talk.

Assessment

One way to assess students' ability to use the word wall is to provide them with a few investigation proposals that use very general language. For example:

- I plan to look at three minerals and tell about how they look and feel.
- I will put four different rock-things in vinegar to see how much of that stuff is in them.
- I am going to do the scratch thing to see how each is hard or not.

Ask students to choose one statement and use the word wall to rewrite the proposal to be more scientific. You will want to review both the extent to which students were able to use the word wall language as well as their accuracy. Students who struggle with writing can be asked to make the revision orally.

Support or Extend

Some students may need additional support to

the process of conducting and discussing investigations. Students can also be encouraged to use the word wall as they write about their investigations. As students become more proficient in using the language, teachers can build on the idea to help students refine their use of scientific language. For example, students can be taught the difference between saying "the data prove . . ." and "the data suggest . . ." or "the hypothesis was correct . . ." and "the hypothesis is supported . . ."

Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Content Standards

Grades K–8

Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry (K–8)

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academy Press.