

Working with English Language Learners in Science

Teaching is a complex adventure. Ensuring *all* learners have opportunities to grapple with challenging science topics is even more so. We understand that Pomona Unified School District (PUSD) has provided professional development for the support of English language learners (ELLs). While the RESPeCT PD program, the RESPeCT science lesson plans, and the STeLLA teaching strategies also provide ways to help you attend to the special needs of your English language learners, don't limit yourself to the strategies recommended in the RESPeCT lesson plans. We encourage you to draw from your larger repertoire of approaches to help English language learners as you teach the science lessons.

Following are some of the more common recommendations for working with ELL students:

- Observe your students carefully. If you aren't sure they understand, it's a good idea to ask questions to get a clearer picture of their comprehension and then paraphrase, summarize, or use synonyms to aid their understanding. You can also check for comprehension by asking students to turn to a partner and explain or retell, respond in their science notebooks, or give you a signal to let you know whether they understand.
- Provide sufficient response time for ELL students. As they hear what you say in English, they may need to think of the words in their native language before they can process what has been said. Then they will decide on a response in their native language, adapt that response to English, think about the response to make sure it makes sense, and finally respond. It often takes years of exposure to the English language before a student can bypass the translation steps and truly think in English.
- Make sure that assessments (particularly formative assessments) actually provide information to ascertain strengths and weaknesses in students' thinking and target areas of instructional need. Oral assessments and other informal, authentic measures often show more than traditional paper-and-pencil formal assessments for ELL students.
- Keep expectations high but reasonable. ELL students should not be considered slow learners. Typical ELL students experience frequent spurts of extremely rapid growth, as their English oral language, literacy skills, and strategies progress. Language experts tell us, however, that it may take several years of instruction in English for language learners to arrive at the same level of language acquisition as native English speakers.
- Integrate ELL students' cultural experiences and background knowledge into the learning environment. This goes beyond what they know about their home countries and delves into what they do in their homes and communities here in the United States. What experiences do they have with natural phenomena that can be tapped into during science lessons (e.g., food preparation, gardening or farming, use of tools)?
- Use a variety of concrete items, drawings, or photographs and elicit students' ideas and language for describing them.
- Allow ELL students to work in small groups, some of which are homogeneous, and others that are heterogeneous, containing students who can serve as models for their peers. Interaction and discussion about science ideas should be encouraged in both groups.

- Choose vocabulary words carefully and provide explicit instruction, allowing opportunities for students to practice the use of these words.
- Think carefully about when to introduce and define science vocabulary words. ELL experts often advise teachers to preteach vocabulary; that is, introduce vocabulary and definitions before teaching a lesson. However, constructivist science teaching works differently. For science learning, it's best to give students experiences with phenomena or objects first. Let them use their own words for describing the phenomena/objects. Then once they're familiar with the phenomena/objects, introduce the scientific vocabulary words. This way the new words will form neural memory in more than one location.
- Limit vocabulary words to those most critical in science, with a focus on deep understandings of key ideas. Introducing too many specialized vocabulary words can overwhelm students and distract them from thinking deeply about the big ideas.
- Instead of just giving directions to ELL students, specifically model what you expect them to do. In other words, show them how to accomplish the task and give an example of exactly how the final product should look. Be conscientious about explaining and/or pantomiming synonyms, idioms, and figures of speech. All languages contain these puzzlements, and they need to be explicitly taught, not avoided, if students are going to acquire the English language.
- Be careful in your use of idioms. As Stephen Cary (2000) wrote, "In terms of language acquisition, we might really upset students' applecart, put them behind the eight ball, and keep them in the dark 'til the cows come home. They could find themselves up a creek without a paddle and paying through the nose because we didn't want to talk straight from the hip and give them language that was the real McCoy, language that could help them go the distance and bring home the bacon through thick and thin."
- Pair ELL students with a reading buddy, a writing buddy, and/or a language buddy—a supportive partner who can model language and literacy.

In addition to these general instructional practices, following is a list of specific strategies you may have used. When these strategies and instructional practices are incorporated with the thought-provoking activities in the RESPeCT science lessons, they will promote rich contextual language and science development not just for English language learners but for all students.

Oral Language Development

- Utilizing explicit teacher talk
- Thinking aloud during instructional activities
- Modeling and utilizing peer models
- Retelling
- Dramatizing and pantomiming
- Encouraging peer discussion

Read-Alouds

- Carefully selecting quality books in a variety of genres
- Encouraging students to interact and respond to texts
- Modeling phrasing
- Modeling that reading is fun

Shared Reading

- Carefully selecting or preparing enlarged texts
- Demonstrating key concepts
- Following up with the books/notebooks students make

Think-Alouds

- Carefully planning lessons and marking spots where think-alouds will be beneficial
- Modeling reading-and-writing strategies
- Modeling problem-solving strategies with new vocabulary

Thinking Maps

- Supporting students in visualizing specific cognitive processes (comparing, grouping)
- Enhancing the ability of students to detect and construct meaningful patterns by means of eight visual representations
- Using in a class discussion, in small groups, or individually

Shared Writing

- Teaching explicit writing strategies
- Demonstrating revision, editing, elaboration, and conventions

Independent Writing

- Providing time for practice, response, and reflection

Vocabulary Acquisition

- Teaching essential vocabulary words and phrases through word walls and Frayer models with the opportunity to draw word representations and/or ELL (visual) dictionaries or glossaries in a science notebook. In short, using multiple modalities to teach vocabulary.

Other strategies that support vocabulary acquisition include the following:

- Google the focus vocabulary words, and choose the images category. Connect the images to the vocabulary words. When vocabulary words are more conceptual than concrete, use the images to start a discussion rather than name an object.
- When possible, bring in realia to make the meaning of objects clear, physically demonstrate verb phrases, or ask students to role-play, and use relevant film clips to illustrate vocabulary.
- Sentence stems or starters, such as “I think ...” or “Today I learned ...,” support students as they write expository text and use content-area vocabulary from the word wall or the glossary in their science notebooks. These stems provide support without dictating student writing and allow for the development of student voice in science writing, which promotes ownership of the materials.
- Labeling diagrams with words, sentences, and Illustrations in science notebooks supports student vocabulary development. Doing so provides another opportunity to build relational and contextual knowledge of the words and creates nonlinguistic representations.

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