

# Strategies for Supporting Emerging Multilingual Learners' Sensemaking



## Why are these strategies important?

The shifts called for by the Next Generation Science Standards and the NRC's Framework for K-12 Science Education require that students have opportunities to authentically engage in science and engineering practices. Science and engineering practices require complex use of language. In order for emerging multilingual learners (EMLs) to have equitable opportunities to engage in science and engineering practices, teachers must be able to both leverage these students' linguistic resources and address the language needs that they may have.

The OpenSciEd instructional materials were designed with many instructional structures and strategies to support EMLs. Below we outline ten research-based strategies for supporting EMLs and when relevant, where those strategies can be found in the OpenSciEd materials. Here, we have grouped these strategies into the following categories:

- [Student Engagement](#)
- [Students' Expression of Ideas](#)
- [Use of Language for Scientific Sensemaking](#)
- [Representation of Content](#)
- [Additional Strategies](#)

These groupings capture some of the ways that these strategies appear in OpenSciEd instructional materials, and that teachers can use them to support their EMLs. However, depending on how and why they are incorporated into a lesson, some of these strategies could fall under multiple categories.

## Student Engagement

*\*How are students engaged and/or motivated to learn?*

Description	Why this Strategy is Useful	Example of how the Strategy is Used
Situate a lesson or unit's anchoring phenomena to your local context, keeping in mind students' home cultures and languages.	<i>This can help make the phenomena more meaningful and accessible for your EMLs, which in turn can support their sensemaking.</i>	<ul style="list-style-type: none"> <li>• In each OpenSciEd unit's Anchoring Phenomenon Routine, which teachers can further situate to their location context.</li> <li>• The <a href="#">Self-Documentation Technique</a> is utilized in several units.</li> </ul>
Provide students with opportunities to talk in pairs or small groups before students engage in whole-class discussions.	<i>Smaller group structures offer EMLs a chance to engage in sensemaking with their peers, and also offer them the space to use their linguistic and nonlinguistic resources to express their ideas (and learn from other students' uses of these resources too).</i>	<ul style="list-style-type: none"> <li>• Throughout the OpenSciEd units, before a whole class discussion, students are prompted to first share ideas with partners or small groups</li> </ul>

## Students' Expression of Ideas

*\*How are students able to express what they know in multiple ways?*

Description	Why this Strategy is Useful	Where this Strategy is Used
During moments when students are tasked with expressing their ideas, encourage them to do so through linguistic (oral and written language) and nonlinguistic modes (e.g., drawings, graphs, symbols, gestures).	<i>Making connections between written or spoken words and non-linguistic representations helps EMLs generate richer understandings of scientific phenomena.</i>	<ul style="list-style-type: none"> <li>• Throughout the OpenSciEd Units, when students update their progress tracker</li> <li>• When students record ideas or consensus models in their notebook</li> </ul>
Encourage students to use both content-specific and everyday registers.	<i>This helps students fully express themselves, allowing peers to evaluate, question, and build off their ideas. Switching back and forth between different registers is especially important for EMLs because it helps them draw on their full range of meaning-making resources.</i>	<ul style="list-style-type: none"> <li>• Throughout the OpenSciEd Units, students are given multiple opportunities to share their ideas (e.g., when building their noticings and wonderings chart, adding to the Driving Questions Board, or taking an assessment).</li> </ul>



## Use of Language for Scientific Sensemaking

*\*How are students unpacking how language can be used to make sense of phenomena and how language is used in science?*

Description	Why this Strategy is Useful	Where this Strategy is Used
Explicitly address how language is used for scientific sensemaking (e.g., to construct questions, or make claims that are supported by evidence).	<i>This transparency will allow EMLs to more deeply understand how language can be used to partake in science and engineering practices.</i>	<ul style="list-style-type: none"> <li>• During an OpenSciEd unit's Navigation Routine when lesson questions are revised.</li> <li>• In OpenSciEd's Building Understandings, or Consensus discussions.</li> </ul>
Purposefully use sentence starters to model particular oral or written language production skills, like forming scientific questions, explanations, or engaging in argument from evidence. It is important that such scaffolds be used purposefully and removed when no longer needed.	<i>Sentence starters help EMLs develop English language skills all the while expressing their ideas to peers.</i>	<ul style="list-style-type: none"> <li>• In the OpenSciEd <i>Communicating in Scientific Ways</i> poster</li> <li>• In OpenSciEd's Building Understandings, or Consensus discussions.</li> </ul>

## Representation of Content

*\*How are students able to access the information in multiple ways?*

Description	Why this Strategy is Useful	Where this Strategy is Used
Break down the meaning of scientific words that are central to a lesson, especially if these words have different meanings in different contexts (i.e., in science versus everyday use).	<i>This provides EMLs the chance and space in which to discuss any preconceptions about the meaning of the word(s), and to draw upon their personal experiences.</i>	<ul style="list-style-type: none"> <li>• When deciding whether a word is one students will “earn” or “encounter”</li> <li>• In OpenSciEd's Initial Ideas discussions</li> </ul>
Use multiple types of representations to develop students' understanding of new vocabulary (e.g., gesturing, drawing a representation).	<i>Doing so helps EMLs form a deeper understanding of new vocabulary related to the focal science topic.</i>	<ul style="list-style-type: none"> <li>• In OpenSciEd's Building Understandings, or Initial Ideas discussions</li> <li>• When adding newly “earned” vocabulary to a Word Wall</li> </ul>



## Additional Strategies

Description	Why this Strategy is Useful	Where this Strategy is Used
<p>Depending on the goals of a lesson, intentionally group multilingual students with certain peers (sometimes with peers who know the same languages as them, and other times with peers whose English language development is slightly more advanced).</p>	<p><i>Thoughtful grouping that varies throughout a unit allows EMLs to benefit from working with different peers and learn from the uses of other students' linguistic resources.</i></p>	<ul style="list-style-type: none"> <li>• Teachers can create seating charts with intentional groupings of students.</li> <li>• Students can be regrouped intentionally during investigations, requiring them to work with different students.</li> <li>• When moving to a Scientists Circle, students can stay near a designated partner.</li> </ul>
<p>When applicable, call attention to cognates. Cognates are words that are similar in both spelling and meaning across languages. Many science vocabulary words have cognates (e.g., photosynthesis in English = fotosíntesis in Spanish).</p>	<p><i>Highlighting cognates can support EMLs in making connections between their home language(s) and new science vocabulary in English, vocabulary they may then use to do sensemaking work.</i></p>	<ul style="list-style-type: none"> <li>• When possible, word Walls could include both “earned” vocabulary and cognates</li> <li>• Any reading assignments could be modified so that words with cognates are identified using parentheses.</li> <li>• Throughout OpenSciEd units, students can be encouraged to share cognates that they identify</li> </ul>

