

Non-academic Language

Resources for Sensemaking

- Students can use metaphors and stories to explain scientific phenomena.
- Students use their everyday language and experiences to make sense of scientific phenomena

Pedagogical Implications

- Presume the ideas make sense to the student.
 - Work with the student to clarify their ideas and position the students as thinkers and holders of ideas worth discussing.
 - Value the everyday language students bring to the phenomena, rather than seeing the ideas as wrong, can help students access the learning.
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Gesturing

Resources for Sensemaking

- Students use gesturing to make their thinking transparent to others when we do not have an agreed upon set of words to communicate and when words (e.g. scientific terminology) have multiple meanings.
- Gesturing helps others visualize interactions and mechanisms (including unobservable ones) that are difficult to picture from words alone.

Pedagogical Implications

- Watch for gestures as students explain their ideas or restate other ideas.
 - After a student uses gestures, emphasize that it was helpful to see what they were thinking and ask others to use gestures.
 - Use gestures yourself when you are checking to see if your restatement of a students' idea is what they meant.
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Multiple Modes of Expression

Resources for Sensemaking

- Although schools tend to accord higher status to expository or definitional ways of expressing science, students can bring other models such as storytelling and metaphor
- In addition to words, students drawing and mathematical expressions can be important ways for them to make sense of science.

Pedagogical Implications

- Use open prompts that offer students multiple ways to represent and express their ideas.
- Have students go public with their different modes of expression in both small group and whole group structures.
- Value multiple modes of expression and not just expository or definitional examples.

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