

# What We Call Misconceptions May Be Necessary Stepping-Stones Toward Making Sense of the World

## Reflection by Molly Fox

- **What are three things you learned from reading this article?**

1. Telling the Answer: telling students the answer has little effect on their learning and often does not stick with them due to the lack of meaning.
2. Sense-Making: working on and with ideas. This makes so much more sense than telling the answer. This connects with all subjects as well, not just science. Both ideas and texts should help students make meaningful connections. Students should use their understanding to make sense of science. Teachers should think less about telling answers to misconceptions and more about engaging students in science reasoning.
3. Productive Reasoning: Use discussions to identify strengths and weaknesses of ideas.

- **Why is it important to pre-assess students' knowledge prior to teaching a lesson or unit?**

It is important to pre-assess students' prior knowledge to identify their misconceptions. Identifying misconceptions is not used to "stamp out" their ideas but are helpful in generating questions. Teachers should not find and fix misconceptions but use these to help with idea-revision.

- **What "wacky" ideas (if any) have you heard your students come up with?**

This is my nineteenth year teaching and nothing wacky pops into my head. I'm sure there are some wacky ideas that students have had but I can't remember a single one right now. However, I can think of a common misconception students have each year- that mass and weight are the same.

- **Where do you think those ideas originated?**

I think the idea that mass and weight are the same come from not truly understanding what mass measures and what weight measures. We use scales to measure weight which has to do with gravity- they are told this- the idea doesn't stick with them because it's not meaningful. We use balances to measure the mass of objects. The known masses are labeled in grams but are often referred to by students as weights. Here lies the problem. Using balances is hands on which is a huge win in the "teaching science" thinking- but are students really understanding what they are measuring or just filling out a table?

- What will you do differently in your classroom based on these findings?

Discussions naturally fit in with reading, writing, and math. I have not always allowed the time or space for students to discuss science and their ideas. I also must add sense-making and productive reasoning to our science inquiry and learning. I am at fault for telling the answer too quickly. I now see how this confuses students about their own ideas. Figuring out students' prior knowledge but also adding what their misconceptions are will prove to be worth the time to help students engage in science and make meaningful connections.