

Five Easy Strategies to Improve Scientific Arguments

Source: <https://teachingsciencein3d.com/scaffold-science-arguments/>

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Here are five things that you can do to help students with the practice of **Engaging in an Argument Using Evidence**.

1) Look at Previous Grade-level Bands

It's likely that students won't be ready to engage in arguments as described in their grade-level band. Therefore, it will be difficult for them to start engaging with the practice at their designated grade-band. So, it is helpful to jump back a grade level band to scaffold the practices for them.

For example, middle school students struggle with the reasoning component of an argument. But, the upper elementary grade band focuses on having students determine which claim a piece of evidence supports. Therefore, this is an excellent starting point for middle school students.

CARD SORT: Erin suggests writing the evidence on cards. Then, have your students sort the cards based on which piece of evidence this supports.

For more ideas about how to do this, check out the [NSTA Matrix](#) for the Science and Engineering Practices.

2) Have students explain why the evidence supports a claim *before* calling it reasoning.

After Erin has had students sort the evidence into piles, she has them explain why they placed the cards in each stack. As a result, she is actually introducing reasoning to her students without asking them to provide reasoning.

Then, she introduced the CER framework to her students. This is the claim, evidence, and reasoning of a scientific argument. She provides one page explain the claim, evidence, and reasoning to her students and has them keep it in their interactive notebook.

To view these notes, along with her other introduction to argumentation activities, [click here](#).

3) Provide students with sample scientific arguments and have them identify the components.

Once students are aware of the three parts of an argument, Erin provides her students with sample arguments. Then, she asks her students to highlight the claim, evidence and reasoning in different colors.

She provides her students with [three different arguments](#) and has them work on one at a time. Then, they review it as a class. By the time that they have gotten to the third argument, most students can correctly identify the claim, evidence, and reasoning in an argument.

4) Have students write an argument using the CER format.

Once students can correctly identify the parts of an argument, Erin asks her students to write an argument about the content they are currently covering. She provides them with a [graphic organizer](#) and has them write an argument using the CER framework.

Erin prefers starting with a written argument. This is because written arguments give students time to think about the components of the argument. Verbal arguments happen more quickly. So, it can be harder for students to formulate a well-structured verbal argument.

Bonus Tip: Have Students Provide Feedback to Other Students

Provide students with a rubric or other guidelines. Then, ask them to review other student arguments and provide feedback using the rubric. Once their arguments have been reviewed, provide them with the opportunity to revise their argument before they submit the argument.

5) Have your students engage in verbal scientific arguments.

The biggest problem with CER is that students aren't really arguing. The CER format helps students understand the components of the argument. However, there isn't a lot of feedback.

In order to get the argument going, there must be a discussion component. This practice is most authentic when it is done verbally. When students engage in discussion, they get the full benefit of using this practice to figure out the content.

OTHER RELATED RESOURCES:

Video - Claim Evidence Reasoning (Concord Consortium) - *student friendly*
<https://concord.org/blog/student-friendly-video-on-scientific-argumentation/>

High Adventure Science - Concord Consortium Modules -- (scientific argumentation)
<https://learn.concord.org/has> -- MS/HS earth science

Science Argument Cards - <https://shop.argumentdriveninquiry.com/products/70007> (\$)