

Instructional Strategies – Engaging in Argument from Evidence

Scientific argumentation is a process that occurs when there are multiple ideas or claims (e.g. explanations, models) to discuss and reconcile. An argument includes a claim supported by evidence and reasoning, and students engage in debates to evaluate and critique competing arguments.

Potential Instructional Strategies for *Engaging in Argument from Evidence*

1. Introduce students to the argumentation framework of claim, evidence and reasoning (CER). A claim answers a question or problem, which could be an explanation or model. Evidence is data that supports the claim, such as observations and measurements. Reasoning explains why the evidence supports the claim using scientific ideas or principles.
2. Provide students with scaffolds such as a graphic organizer, sentence starters or questions that highlight the CER components to help them craft their arguments.
3. Revise argumentation questions in lessons or curriculum to ensure that there is more than one possible claim that students could potentially support with evidence. When students have multiple competing claims, there is more opportunity for critique.
4. Facilitate a discussion about the norms for argumentation. Explain to students that they should be talking directly to each other, and not through the teacher. In addition, they should be questioning and critiquing each other's ideas. However, it is also important for students to be willing to change their minds if new ideas or evidence are presented by their peers that convinces them of the strength of a competing claim.
5. Create a poster in the classroom that supports the CER structure as well as students critiquing different ideas. It could include sentence starters such as, "My evidence is..." and "I disagree because...", as well as questions such as "What are some other possible claims? Do we have support for those claims?" and "Why did you decide to use that evidence to support your claim? Could the data be interpreted in a different way?"
6. Model for students what it looks like to question or critique another person's idea. For example, "I disagree with Maria's claim, because I interpreted the data in a different way. I think the data shows that lung capacity is important for..."
7. Limit teacher talk during argumentation by physically removing yourself from the discussion (e.g. sit in the corner of the room) and/or telling students that you have a specific task during the discussion. For example, you can tell the class that your job is to record the different evidence that comes up during the conversation and that you will not be actively talking during the discussion.

For a classroom example of instruction using this science practice, visit our website at www.sciencepracticesleadership.com and click on the Grade 7 Exemplar under Case Studies.