Deepen Your Knowledge About Backing

In the game, backing is additional information that supports evidence, or "evidence to support evidence." In other words, backing validates evidence. When a piece of evidence is well-backed, a student is able to respond to critical questions adequately, strengthening his or her argument.

How Does Using Backing Help My Students?

Well-backed evidence strengthens an argument by providing responses to critical questions and validating the evidence. Asking critical questions and using backing go hand-in-hand: the questions probe for assumptions and other weaknesses, while backing strengthens an argument by providing additional information to satisfy the questions.

Understanding the need for well-backed evidence also prepares students to critique others' arguments. Asking "What information is missing from this argument?" and "What assumptions is this argument based on?" can lead to more specific critical questions, depending on the argument scheme. *Thinking about the information that satisfies critical questions helps students construct specific critiques of their own and others' arguments. It also helps them make stronger arguments.*

An Example: *Argument from Authority*

Following is an example from the game of an *argument from authority*. In this game mission, the colony is debating whether to remove Lucas from his position because he broke security protocols:

> *Lucas should have to leave his position at the Academy. J.R. Coop is an authority on security and says Lucas should have to take a different position on Mars**. J.R. is a five-time champion in security tactics competitions, and the second and third place winners of the World Security Championship agree with J.R.***

The player's claim is that "Lucas should have to leave his position at the Academy," which is supported by evidence that says, "J.R. Coop is an authority on security and says Lucas should have to take a different position on Mars."

This is an argument from authority. Arguments from authority are subject to critical questions like "Is J.R. Coop really an expert in the area of security protocols?" and "Do other experts in this area agree with Mrs. Coop?" The player in this example has included two pieces of backing that respond to those questions in his argument: J.R. is a champion in security tactics competitions and other experts agree with J.R. The evidence is well-backed, and therefore the player made a strong argument.

As with the main form (or forms) of evidence in any argument, *backing must be relevant and non-contradictory* for the argument to be strong. And it must be factually correct, of course. If information used as backing is irrelevant or contradicts the evidence, then an argument is weakened.

What This Means for My Students

When evaluating arguments, there are six steps your students can follow:

1. *First: Remember that this is an argument:* someone is trying to persuade me (or I'm trying to persuade someone) that a claim they are making is correct. *But don't assume the argument is strong!*
2. Identify the claim the argument is based on

3. Identify the evidence used to support the claim, and determine whether it is relevant and supports the claim
4. Identify what backing, if any, supports the evidence
5. Based on that evidence, identify the argument scheme
6. Ask critical questions to check the assumptions that the argument is based on**

**You can learn more about critical questions in the "Deepen Your Knowledge About Critical Questions" document.

MODELING & FORMATIVE ASSESSMENT

You should consider starting this activity with the whole class if you are just beginning to use critical questions. Modeling your thinking processes—using the six steps above as appropriate—will help your students see how providing backing for evidence responds to critical questions and strengthens arguments. Otherwise, use this activity with smaller groups who might need more guidance on how to use backing. Write or project the argument (without the correct scheme and critical questions) so that students can see it.

Argument
The colony is deciding what its next building project should be. Some people think the colony should build more greenhouses for agriculture; some think they should build more laboratories to enable additional research; and some think they should build more dwellings for people to live in. Here is one argument: The colony should not build individual dwellings because it's not practical on Mars. Building individual dwellings would be just like building malls on Mars. *Argument scheme:* Argument from comparison *Possible critical questions:*
• Are these two cases really similar?

Start by modeling how students might identify an argument scheme based on a claim and evidence, before asking critical questions. Below is an example:

Okay, what's this argument about? This says that the colony is "deciding" about the next building project. To me, that sounds like they haven't made a decision yet, so I'm guessing that's what the argument is about. It looks like they have three choices: greenhouses; labs; or dwellings.

"The colony should not build individual dwellings because it's not practical on Mars"—that "should" makes me think this is the claim. That's what someone is trying to convince others about. So, someone is claiming that that the colony shouldn't build houses. Let me underline that and write the word "claim" next to it.

It also says "Building individual dwellings would be just like building malls on Mars." This is connected to the claim and I think this is the evidence this person is using to support the claim. I'll underline that also, and write "evidence." The claim is "build independent dwellings," and the evidence is "building dwellings is just like building malls."

Now I want to know what kind of argument this person is making, so let me look at the evidence again. What keywords in here give me some idea? I see the words "just like," which makes me think that this person is comparing one thing to another as evidence—"building dwellings…is just like building movie theaters." This seems like evidence from comparison, which means this person is making an argument from comparison. I think I've got my argument scheme.

So, this person is against building houses, and his or her evidence is that it would it be just like building malls. It's an argument from comparison, so one of the first questions I'll ask myself is, "Are these two things being compared really the same?" Well, they're not the same in the sense that they're different buildings. But what if there's something else that this person thinks makes them the same. For example, maybe building malls is really expensive. That's a piece of information that would make this argument stronger, I think. If this person added some backing to the evidence from comparison, the argument would be stronger. Like, what if there was information that said, "Two engineering companies have estimated that building malls on Mars would be incredibly expensive." That would help this person make the argument stronger. But I still don't think this is a great argument from comparison because malls and houses really aren't the same things.

What are some questions to check to see if the observation is true? Let me look back at the evidence. Here it says "seemed to be." That doesn't sound definite. Is the engineer certain about what she noticed? If not, this seems like it might not be a great argument. Also, have other engineers noticed the same thing? If she's the only one, or other engineers didn't notice that people enjoyed living on their own, then this argument doesn't really seem that persuasive to me.

Have students do the same activity with the next two arguments, either in pairs/groups or as a class.

If students are struggling, remind them about the four argument schemes and to think about keywords that give some clues about what type of evidence and argument scheme it is. From there, they can begin to think about critical questions, and what information (backing) might satisfy those questions. Alternatively, ask students to read the claim and evidence carefully and then ask themselves what questions they might have about the evidence. Can they think of any additional information that might strengthen the evidence?

Write or project the argument (without the correct scheme, critical questions, and backing) so that students can see it.

Argument
The colony is debating whether to remove Lucas from his position in the colony because he broke some strict security protocols. One colonist argues that: Lucas should have to return to Earth. A consequence of sending Lucas to Earth is that he won't cause any more trouble here on Mars. *Argument scheme:* Argument from consequences *Possible critical questions:* • How likely is it that these consequences will occur? • Is there evidence that supports the claim that this consequence will occur? *Possible backing:* • It will be impossible for Lucas to interact with people or robots on Mars once he's back on Earth • Legal experts have found that people who make problems on Mars very rarely do so when they are returned to Earth.
Argument
One of the plant scientists on Mars is arguing that the colony should grow more crops on Mars, rather than freeze-dried and dehydrated food sent from Earth. Here is her argument: We should produce more of our crops on Mars. In my

lab, I have planted seeds and am starting to see plants growing.

Argument scheme: Argument from observation

Possible critical questions:

- How certain is the observation?
- Is the observation consistent with other observations?
- Are there other ways to interpret the information?

Possible backing:

- Other people have been able to grow crops in their labs
- On Earth, plant scientists have documented that plants can grow in soil that is like Martian soil
- If people can prove she isn't lying, it seems like those crops must be growing from the seeds she planted