SPEAKER 1: This video shows one way for students to give and receive critiques of their evidence-based scientific explanations. For this gallery walk, students will be critiquing each other's models of flashlight circuits. Tasks, talk, and tools play critical roles throughout this lesson. As you watch, observe what kinds of tasks students are engaged with in order to critique and revise models. What tools help students communicate their ideas? And how does student talk facilitate the critique and revision of models?

This is the model scaffold students have been using since the start of the unit to reason about why and how a flashlight stops working. On the left side, students explain how a functioning flashlight works, and on the right side, how and why a flashlight would stop working if it were turned on for a month.

Students worked in small groups prior to this gallery walk lesson, to revise their initial ideas based on evidence collected so far and to enlarge the model to more easily read and share ideas. Intellectually productive gallery walks need this kind of rich, unique student work as the focus. Otherwise, the gallery walk becomes about merely recognition of work, rather than an invitation for a critique.

Using group-created models is the kind of student work which is ideal for sticky note feedback in the gallery walk because it's rich in ideas and evidence, and no two models are identical. This format allows for students to reflect on their own understanding, while comparing it to each other's ideas. Students use sticky notes to comment on ideas and evidence as well as make suggestions about what to add or what is confusing. In this next clip, the teacher gives directions about the kinds of comments she expects students to make, after looking at and reading each explanation.

SPEAKER 2: We need to help each other communicate clearly about our ideas. You may think that what you said was clear. But one of us walks up to it, and reads it, and goes, huh? Well, huh isn't helpful. Huh plus I see what you mean about electrons, but how is the motion different, might be a way to help that person think about their idea.

So your job, it says it right here. Everyone's going to have this in front of them. This is your job for the next however long it takes, probably 20 minutes. Your job, write a comment or a question that helps the scientists understand where and why you might be confused when you look at their work. Be helpful, use these sentence frames if that helps you. At the bottom-- is the projector on, by any chance? At the bottom, there are some examples of comments.

These comments are nice. And it's nice to be nice. It's nice to give compliments. And they're nice to read. Like, if this is your work and you read, your diagram is amazing. I'm like, yeah, cool. We love it, good. You did a great job. Yay. Nice work. Woo hoo. Like, you feel good about it. But this comment doesn't help me as a scientist think about my work. It's just kind of a warm, fuzzy compliment. Which, compliments are fine.

Hence why it's nice, but not helpful to me as a scientist. That's not helping me fix my diagram. If somebody wrote that about this-- well, number one, I don't really think my diagram is amazing, but that was their opinion. But it doesn't help me think about what I need to add, change, clarify what details I should.

For these comments though, they're still kind of positive, but they give me, as a scientist, a direction to go next. It's kind of a what should I work on next. Sorry. So since this one's next to me, I'll do this one first. So maybe on my poster, somebody wrote, I agree with you. Well, I didn't say that. Maybe they wrote, I agree with you that the wire is a conductor, but you could add more about why it's a conductor. So maybe they just labeled-- not to pick on this person, but you're right here-- you just labeled it conductor. But why is it a conductor?

And then I even got a suggestion, think free electrons. I'm like, ooh, there's an electron poster there. There's electron stuff on the conductor poster. So when I read this, I'm like, OK, there's two things I can go read in the room that help me think about this idea so that I can add or change my drawing. Cool. I have a direction. I can take this and go and do something more.

SPEAKER 1: Students had time to walk around the room and examine their peers' work. Sentence frames scaffolded students' ability to write helpful rather than superficial feedback. Next, students return to their own model and read the feedback they received. They had time to decide if they wanted to add or change their work based on their peers' critique. Some students disagreed with the comments left for them and argued their point with their peers.

Students may not be used to thinking critically about ideas, so some feedback was superficial. Students will improve their skills at giving feedback, the more practice they have doing this kind of work. Some students were frustrated when their own model received vague and unhelpful comments. This boosts their own attention to the kind of quality feedback they give the next time they do a gallery walk.

Let's revisit the tips about the kind of talk, tasks, and tools that help students review the work of their peers. This feedback was not about being right or wrong, but rather giving constructive feedback to improve each group's own unique work. Work that is rich in ideas supported by evidence is ideal for this activity.

Sentence frames scaffold students' ability to provide helpful rather than superficial or vague feedback. Despite this structure, some feedback will still be generic, but will improve with practice. The key part of this activity is having students discuss the feedback they received and decide what they want to do with it. They can follow the suggestion by adding or changing their work. Or they can decide they disagree with the comment based on evidence.

Critiquing models based on evidence and limitations is part of the Next Generation Science Standards' list of science practices. Students must engage in argument if and when their critique is challenged by their peers. Additionally, this unit addresses the energy strand found in the Next Generation Science Standards. For more information about this or other science teaching practices, visit our website at tools4teachingscience.org.