

TIPS FOR PROMOTING DISCUSSION

Practice, Practice, Practice

Discussions are messy. As a discussion facilitator, there's always room for improvement, and there are always many different pathways you could choose. A productive discussion moves steadily toward a consensus understanding of concepts by the group, but it doesn't always end with a neat, tidy conclusion. Embrace the idea that learning is a process. Discussions bring accurate and inaccurate ideas into the open to be examined by the group and to help the instructor learn more about what's going on in learners' minds.

Be self-evaluative, but recognize that leading and participating in meaning-making discussions takes practice. If your first attempts are disappointing, keep at it! Discuss with others about what you might do differently and try again. Learners need practice with discussion, and instructors need practice leading discussions.

Nurturing a Culture of Respect and Curiosity

Introduce group agreements and model respectful discussion. Group agreements are helpful for building a learning community throughout the time a group is together, and they are particularly important during discussions. Group agreements might include the following:

- Listen actively and share ideas.
- Share and ask for evidence.
- Disagree productively to deepen understanding.
- Take space, make space.
- Keep an open, curious mind.
- Build on others' ideas.
- Take responsibility for your impact on others.

The goal is for learners to feel that their ideas are valued by peers and their instructor and to create a "brave space" for the whole group in which learners take risks and are vulnerable with sharing tentative ideas. For support in setting up group agreements with your students, see the BEETLES [Group Agreements for Science Discussions](#) Student Activity Guide.

Nurture a culture of intellectual curiosity. Your learners are already curious when they come to you—it's part of being human. They still may need some modeling and coaxing before they share the sorts of tentative questions and ideas necessary for intellectual inquiry and discussion. They may be reluctant to admit what they don't know in the presence of peers and instructors. Model your own interest in the subject, including your own questions and confusions. Show similar interest in the ideas and contributions of learners and encourage others to do the same. Participate in conversations and investigations by actively trying to figure things out together as a fellow naturalist. Trust that learners will become enthusiastically curious about nature and one another when a culture of intellectual curiosity exists. Remember to learn from your learners—they have lived experiences and expertise that you don't have!

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Encourage participation from all learners, but don't require equal participation from all. Just because some learners aren't speaking as much doesn't mean they're not engaged. Some learners happily discuss in pairs but are reluctant to speak in a larger group. With some encouragement and straightforward prompts (e.g., *What do you think of what June just said?*), quieter participants may start to share, and you can build from there. Forcing participation is rarely successful in discussions.

Point out and model examples of productive discussion and science discussion. To help learners improve their participation, it's useful to point out examples when you or others model good discussion practices, such as asking for evidence or building on someone else's idea. Also encourage learners to respectfully practice offering feedback on one another's discussion practices.

Periodically ask learners to self-evaluate their discussions. After or midway through a discussion, ask the group what aspects of discussion they have done well so far (see the list of group agreements on the previous page) and which ones could use more attention.

Pay attention to unconscious biases that might emerge in discussions, and be aware of your own personal biases. Pay attention to including participation from learners who may have been marginalized. Make sure that all learners' lived experiences and opinions are valued.

Avoid calling mostly on the same learners, encourage participation from others, and accept all responses without showing preferential excitement about particular learners' responses.

Starting Small

Start out with mostly pair discussions and work up to larger group discussions as you and your group get more comfortable with discussion. Discussing in pairs is much easier for most learners *and* instructors to manage.

Give options. Offer many opportunities for learners to discuss in pairs and in small groups to encourage peer-to-peer learning and to prepare them for whole-group discussions. Break up large group discussions with *Turn & Talks*.

Mix discussion with activity. Moving around physically and back and forth from active, hands-on activities to discussion can reinvigorate learners and jumpstart discussions.

Use rich experiences of learner-centered exploration of nature to develop science language and conceptual vocabulary.

Asking Questions

Plan thoughtful questions in advance, but also plan to improvise. Small adjustments in phrasing can sometimes make or break a discussion question, so it pays to plan and be thoughtful with your questions. But sometimes, great questions are improvised on the spot. A great discussion-inspiring question is "gold," so record them when you find them, use them again, and share them with others. Ask engaging broad questions and be ready to modify them or shift to another question if interest decreases. Try to figure out

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what makes a question interesting to learners, such as questions about topics that have a variety of interesting ways to think about them. Try to find questions that elicit nuances, details, and gray areas to make discussion interesting.

Accept and probe thinking. Ask mostly broad questions. In general, give neutral accepting responses to learner statements (e.g., *Thanks for sharing that. Interesting. What do others think? Okay, I can see that you have given that some thought.*) and invite feedback from the group by asking learners to respectfully agree, disagree, or expand on what others have said.

Wait time. Pause approximately 3–5 seconds after asking a question before calling on anyone to respond. This allows more thinking time and for more learners to respond. Don't always call on the first hand that goes up. Reward thoughtfulness and risk-taking rather than speed. Encourage learners to struggle with questions and ideas rather than answering immediately.

Guiding and Concluding the Conversation

Moderate, don't dominate. Pay attention to the group dynamics. Instructors need to balance offering guidance while also allowing learners to drive the discussion.

Keep discussion as learner-driven as possible. Make sure learners have the opportunity to share their lived experiences and prior knowledge. Avoid getting carried away with interjections of your own stories and perspectives.

Conclude the conversation by summarizing what has been discussed (or ask a learner to summarize) and any consensus understanding of concepts that has emerged. Offer learners a chance to reflect on what they have learned and what helped them to learn. Ask them to think about what surprised them, new questions they have, what has changed in their thinking, or to respond to the prompt: *I used to think _____. Now, I think _____.*

Thinking Metacognitively

Make choices. Many different threads tend to come up during a discussion, and you can't pursue them all as a group. Although you want to make sure every idea is heard and acknowledged, you can keep the group focused and on-topic by choosing which paths to spend more time pursuing with follow-up questions. It's easy to follow interesting tangents, but it is unsatisfying to come to the end and realize the main topic was never fully explored. Try writing interesting but off-topic ideas in a visible "parking lot" or "bike rack" for future discussions and then refocusing the group on the main topic. Everyone will know they are being heard, even if their topic is not immediately discussed.

Seek out the edges of your own understanding. When discussions steer toward topics and questions that you don't fully understand, embrace the opportunity! Let learners see you grappling with ideas, too. Figuring things out together makes you a "guide on the side." Some educators avoid discussing unfamiliar topics because they think they will lose respect from their learners, but the reverse is often true. Learners often respect teachers more for being curious and engaged alongside them, and they are more likely to engage with what they see as authentic inquiry.



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Research in advance known common misconceptions. Knowing that many learners think soil is the main “ingredient” of trees can help you frame and guide a discussion about where the mass of a tree comes from, perhaps by bringing pivotal pieces of evidence into the discussion. Awareness of common misconceptions can also help you recognize and understand them in statements made by learners. When these ideas emerge, listen carefully and ask probing questions.

If there is a specific answer or response you are looking for from the group, and you’re asking leading questions, the discussion may seem inauthentic and not very lively. In those cases, you might be better off just telling the group what you want them to know—a discussion may not be the right strategy.