TALK SCIENCE FREQUENTLY ASKED QUESTIONS

1. *What if I continually run out of time for discussion?*
2. *What's the best way to get started?*
3. *What if we're having a discussion and I can't understand what they're trying to say?*
4. *What if I fall back on my old way of doing things?*
5. *What if no one talks?*
6. *What if two or three students dominate the discussion?*
7. *What about the student who never talks?*
8. *Discussing ideas takes a long time; what if I can't cover as much ground?*
9. *Do we have to be in a circle to conduct our discussions?*
10. *What if some students are disrespectful and out of control?*
11. *Do I simply "step out of the conversation?"*
12. *Does every student have to talk in every discussion?*
13. *How do I make sure everyone understands and follows?*
14. *How do I make sure we talk about the important science ideas?*

1. What if I continually run out of time for discussion?

Doing investigation-based science takes time and you may find class time running short before the meaning-making discussion. Many teachers do. However, it's important to keep in mind that the discussion is a critical part of learning. It's where students' ideas come together.

Here are several strategies that can help you meet the time challenge. We'd love to know if you have others.

- Save time up front. Carefully limit the amount of time allocated to introducing the investigation. Take advantage of transition time. As you transition from another subject to science, expect students to automatically open their notebooks and review the last session's work. Then, when students are focused, succinctly introduce the new investigation question and get rolling.
- Let students know how much time they have for their small group investigation work and stick with it. At first, they may run short of time, but soon they'll know they need to use time efficiently.
- Schedule the discussion for another time period. You'll likely find that students bring more energy to the discussion when a separate time is provided. Science writing and discussion build literacy skills too. Students' science experiences simply provide relevant material to talk and write about. In essence, you'll be doubling the learning, while using the same amount of time.

Copyright © 2012 by TERC

2. ***What's the best way to get started?***

Before you begin productive talk in your classroom, build your confidence and that of your students by starting to use some of the talk moves yourself. See: http://inquiryproject.terc.edu/prof_dev/pathway/Goals_and_Moves.pdf

Discuss expectations for productive talk with your students and post the expectations for all to see. Tell students that discussions are an important part of the learning and that it's important for everyone to contribute. For help in establishing a culture of talk in the classroom, see: http://inquiryproject.terc.edu/prof_dev/pathway/pathway5.cfm?pathway_step=step2&pathway_substep=substep1

3. ***What if we're having a discussion and I can't understand what they're trying to say?***

If you are puzzled by what a student is saying, several strategies can help. First, you can simply say, "I don't understand. Could you say that again?" If you still are not sure you understand, you can use the talk move that verifies or clarifies ideas: "So, are you saying . . .? Do I have that right?" This move is particularly helpful in building confidence that you can deal with unintelligible contributions. It also gets students used to the fact that you will respond to their statements with full attention, taking them seriously and following up.

Another strategy is to ask other students to help. "Could you help me understand what J. is saying?" Or, "Does anyone understand what J. is saying, and can repeat it or put it into their own words?" It's then helpful to go back to the original student to make sure that they've gotten the idea right. Students will come away feeling that their ideas matter and are important.

4. ***The discussion starts well, but I fall back on my old way of doing things.***

If you find yourself reverting to the familiar role of asking questions that have a single correct answer (an answer that you are looking for) and students are providing short answers, it may be because you're responding with judgments, such as "Good" or "That's right" or "Does someone have a different idea?"

These kinds of responses, can work against students listening critically to each other and reasoning with evidence. To reason about complex ideas, students have to put forward competing ideas and weigh the relative merit of each with evidence. Telegraphing correctness too early can actually cause them to stop thinking for themselves, and instead orient them to simply trying to get the right answer that you are looking for.

It turns out that this shift from praising correct answers or evaluating students' ideas to keeping a more neutral "poker face" stance and saying things like, "Interesting . . . (wait time). What do the rest of you think of that?" or "Can you say a bit more about that?" is not what we're accustomed to and it takes practice and getting used to. It's also helpful to be up front with students and tell them that you're NOT going to tell them at every moment whether they're right or not. You might explain that you're more interested in their reasoning with evidence than in them simply "getting" the right answer. Instead, you're going to encourage them to think for themselves and with their classmates because that's what scientists do.

Copyright © 2012 by TERC

At the same time, there's nothing wrong with using traditional methods of question, answer, and evaluation when the material warrants it, such as in reviewing material or checking what students remember. Discussion is best suited for classroom activities in which you want to foster rigorous thinking, coordination of ideas and evidence, and complex reasoning.

5. ***What if no one talks?***

Do students really understand the discussion question? Sometimes we underestimate the amount of time it takes students to process a question and then formulate an answer to it. The students may not yet have understood the question. Pose the question and then silently count to ten. Then repeat the question using other words. Count to ten again. If there are still no hands up, ask someone if they can put the question—not the answer, but the question itself—into their own words. Work to make your question understandable, but resist the urge to make the question into a simple, yes-no question. You can get good discussion only if you begin with a good question.

Encourage students to share what was surprising to them. Seeking surprises captures attention and interest.

Are students having trouble putting together an answer? It may be that the question is understandable, but the answer is elusive. It's time to build up to an answer by letting them talk about it. Try a brief partner talk. Then, invariably, students will have something to say.

6. What if two or three students dominate the discussion?

It is all too easy to call on the same two or three students who raise their hands first, who are good at talking, and who are likely to move the discussion in a productive direction. This approach, however, will not result in all students receiving the benefits of productive talk.

A good strategy is to use wait time after asking a question. Give an extra long time for students to think before calling on anyone. Some teachers like to couple wait time with a no-hands rule to provide more time for students to think before responding. Encourage students to use wait time with each other too.

A common problem that many of us have is that we call on the same students again and again, the students we can count on to say something "smart." Why do we do this? Because leading productive science discussions is difficult to do. And being human, we have a hard time with the unpredictability of these discussions, in which students provide much of the content themselves.

You may want to let the active students know that you appreciate their contributions, but you would like them to hold back a bit so that other students may contribute. Let them know that you are going to wait for students to talk, and that silence is a good thing; it provides time for everyone to think.

7. What about the student who never talks?

Understanding the reason behind a student's silence can help:

Copyright © 2012 by TERC

- Fear of being ridiculed: Some students may be afraid of being ridiculed. It might turn out that there are one or two students in the class who have found clever ways to tease or make fun of other students but have not been disciplined for it. Students who fear ridicule will simply make up their minds never to talk. Students must be convinced that you care about their potential loss of face or they will not ever abandon their guarded stance.
- Culturally strange: Talking in class can be culturally strange for some students. Students may find it difficult to talk in class because they have been taught that it is teachers, not students, who do the talking. Often students who are recent immigrants from countries with very teacher-centered education practices find productive talk strange and even objectionable. Take time to explain why these practices help learning and how they are a special part of education in your classroom. Take care not to cast aspersions on cultural attitudes about silence or speaking.
- Too shy: Sometimes students are just too shy to talk. Approach these students individually and let them know that they must be willing to participate, just as everyone in the class is. Explain that everyone has ideas and their ideas are important to the discussion. Ask them if there are any reasons you should know about why they don't want to speak up. Then negotiate a way that they are willing to start participating.

Here are a few strategies for helping the hesitant student:

Let the student know several minutes ahead of time that you will call on him or her.

Work with the student to help him or her to formulate ideas before the discussion.

Lower the stakes by asking the student to repeat another student's idea or to read from his or her notebook.

8. Discussing ideas takes a long time and I'm afraid I won't be able to cover as much ground.

Discussion does take time. But planning will make the discussion more efficient. Sharpen the focus of your discussion. Decide on one very important organizing question to discuss. Post the question for all to see. Then, stay close to this question throughout the discussion. Use 30 seconds of partner talk from time to time. This allows all students to have a voice and can move ideas forward more quickly.

There may be ways to cover more ground, but that does not guarantee that all or most students will come away understanding the issue deeply. Verbally explaining and justifying ideas requires more intellectual work than listening, and is likely to lead beyond awareness to understanding.

9. Do we have to be in a circle to conduct our discussions?

Productive discussions often happen on the spot in many different configurations. The advantage of forming a circle for discussion is that participants can see and hear one another. When adults have conversations, they commonly turn their chairs and face each other or form a circle. This configuration contributes to better discussions. Conventionally, classroom talk is

Copyright © 2012 by TERC

back and forth between an individual student and teacher. The circle configuration eases the way toward increased student-to-student conversation.

10. Some students are disrespectful and out of control

Once you have introduced your students to the importance of productive talk and set the ground rules—i.e., take turns, speak respectfully, listen to one another—be consistent in reminding and reinforcing the expectations. If necessary, stop the conversation and revisit the ground rules. Establish clear consequences for breaking the rules and apply sanctions when violations occur.

11. Do I simply "step out of the conversation?"

In classroom discussions, students are the ones who should be doing the "heavy lifting," but you still have a critical role. Consider a sailboat analogy—the sails do the work of moving the boat (i.e., students). Your role is to have a light hand on the tiller and make sure the boat is headed in the right direction. Your role in discussions is the same—to fine-tune the direction of the discussion and to be sure it stays focused on the key scientific ideas. To do that, you need to listen carefully to the ideas that students raise and decide in the moment how to ensure that what they say is heard by all and understood by everyone, that students elaborate their reasoning with data and evidence, and that they engage with and build on one another's ideas.

12. Does every student have to talk in every discussion?

Certainly in every <u>few</u> discussions, you'll want to hear from everyone, not in <u>every</u> discussion. For a discussion to "add up" so that students make progress in developing complex ideas, arguments, and explanations, individuals need the opportunity to clarify and elaborate their ideas and to build on each other's thinking. Meaningful discussion may require several back and forth exchanges between the same two or three students. The aim is for ideas to deepen through debate.

13. How do I make sure everyone understands and follows?

In order to understand and follow, students first need to listen to each other. The *"Who can repeat or rephrase?"* move communicates that listening is critical. Early on, when you ask students if they can repeat or rephrase what another student said, they may not be able to. It will take some time for students to get used to listening carefully to one another with patience and focus. It's important to use this move in a positive way: when a student makes a contribution, don't look around for the one student who is not paying attention and ask him or her to repeat. Instead, ask "Who understands what Rita said well enough to repeat or rephrase it for us?" Make the ability to repeat another student's utterance a positive accomplishment. Some teachers prefer to ask if someone can rephrase or "put into their own words" what someone has said, rather than "Who can repeat?" Both strategies put the students on notice that they have to be listening hard enough to be able to understand what a peer has said. For some students, repeating might be easier and for others, rephrasing might be less threatening. Rephrasing the idea may make it more understandable to someone else and will provide a repetition of the idea and time to absorb it. It's always helpful to return to the original student

Copyright © 2012 by TERC

and ask if the repeating or rephrasing is acceptable. “Is that what you meant? Did they get your idea right?”

Make sure everyone feels safe enough to disagree with an idea. Then it will be safe to say, “Is there anyone who still thinks . . . and let’s hear why.”

Ask everyone to weigh in on an idea or point made: “Do you agree or disagree? Will the weight increase, decrease, or stay the same?” Then select someone to speak for each point of view, explaining their reasoning.

To motivate students to restate peers’ ideas, assume a stance of a co-inquirer who’s genuinely interested in ensuring that s/he understands the idea contributed by a student. Engage the class in highlighting important, interesting student-generated ideas that are raised in the discussion. Highlighting ideas may provide students with a reason to rephrase peers’ ideas. Expect **everyone** to understand, not just a few.

14. How do I make sure we talk about the important science ideas?

Use the main discussion questions in the teachers’ guide to organize your discussion. These questions have been crafted carefully to reflect the important science idea(s). Post the question for all to see and refer to it often—e.g., “This is the question we are trying to answer.” Put the learning goals on an index card and keep it handy as a quick reminder.

Know ahead of time what you are hoping the conversation will accomplish. Anticipate the everyday ideas students are likely to bring to the discussion.

At times, you may feel that the discussion isn’t moving forward and students need additional information or an additional idea. It’s fine to provide this. The challenge is to add additional information as “a piece of the puzzle” without taking the discussion away from the students. You might say, “Scientists think . . . How does their idea compare with your ideas?” The point is not to tell the students the ultimate answer to the investigation question, but to give them additional information that they can figure out for themselves, and support them to think with this new information. Additionally, if students are not addressing some critical piece of data, it’s fine to simply notice it and point to it: “Wait a second, what about . . . .?” Or it sometimes makes sense to play devil’s advocate: “What if . . . .?” or “Would it always work like that?”

Copyright © 2012 by TERC