

Some Teaching Strategies for Involving All Students ... so All Can Learn

- **To give all students an opportunity to talk about science, volunteers can...**
 - **Use hand raising:** In large group discussions, have students raise their hands and work to call on different students. You can say, "I have heard from a few people a lot; I want to hear from someone who has not spoken yet." Do not call only on the same student that raises their hand over and over again.
 - **Practice wait time:** Pause for 3 to 5 seconds (longer than you think!) after you ask a question before you call on anyone to speak. This allows for students to think and get the courage to raise their hand.
 - **Allow many students to respond to a question:** After you ask a question, say that you'll wait for at least 5 students to raise their hands before you call on anyone to speak. If applicable, ask several students to speak.
 - **Assign which students from small groups will report to the large group:** You can do this in many ways, for example the student who most recently had a birthday.
 - **Encourage student voices:** Encourage students to share their ideas and try to talk through student misconceptions instead of immediately correcting wrong answers. Make them feel safe in participating.
- **To give all students an opportunity to handle materials, volunteers can...**
 - **Bring lots of materials:** It's optimal to have enough materials for students to work in pairs; if you're bringing in only one specimen (for example, a brain), have enough gloves for everyone.
 - **Plan to do a hands-on activity:** Lectures and demonstrations don't involve all students in handling materials.
 - **Work in small groups or stations:** Divide students among volunteers and teacher. Working in small groups allows for more student participation and engagement.
 - **Monitor student groups:** Encourage students to share the materials and that no one student in particular handles the materials.
- **To give all students an opportunity to think for themselves, volunteers can...**
 - **Again, practice wait time:** Pause for 3 to 5 seconds (longer than you think!) after you ask a question so everyone has a chance to think about the question quietly to themselves.
 - **Ask open-ended questions:** Instead of asking, "How many chambers does the heart have?", ask students, "What do you know about the structure of the heart?"
 - **Allow students time to write:** An opportunity to jot down their ideas on paper helps many students rehearse what they may want to ask or share in a whole group discussion.
 - **Use a Think-Pair-Share:** An opportunity to first think quietly, then share their ideas with another student helps many students rehearse what they may want to ask or share in a whole group discussion.
- **To give all students an opportunity to do science for themselves, volunteers can...**
 - **Keep your hands in your pockets:** Tell students how to do things, don't physically do it for them.
 - **Answer questions with questions:** Often students know more than they think, so before answering their questions, probe what they know further with another question. For example, a student might ask, "What is blood for?" You could answer, "Well, what do you know about blood?" **See back of this handout titled *Questions are the Answer*, for more examples.**
- **Try not to plan too many activities. Students need TIME to become involved - to think and talk about science.**