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.**