

## UCSF Science & Health Education Partnership

### Some Teaching Strategies for Involving All Students

- **To give all students an opportunity to talk about science, volunteers can...**
  - **Use handraising:** in large group discussions, have students raise their hands and work to call on all students. You can say, “I have heard from a few people a lot; I want to hear from someone who has not spoken yet.”
  - **Brainstorming:** ask a question that has more than one answer before, after, or during a lesson and make sure that each student has a chance to share his/her answer.
  - **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. See handout on wait time.
  - **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.
  - **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.
- **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:** place 2 volunteers with half of the class or one volunteer with a quarter of the class.
  - **Monitor student groups:** pay attention to which students have their hands on the materials and encourage students to share 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?” Also, see the handout titled *Questions are the Answer*.
- **Try not to plan too many activities. Students need TIME to become involved - to think and talk about science.**