Teacher Commentary
The Big Brain: A Cooperative Learning Protocol

Question: What does it take to get students to work effectively together? What have you done to teach students how to work in small groups?

Answer: The first real task is to create a safe environment where all ideas are accepted and a variety of methods for making sense are valued. I try to establish this environment by setting *standards of communication and practicing different methods of communication*.

Standards of Communication
Table Groups:
Every day, students review and discuss the previous night's homework with their table groups. As they do so, they abide by several standards of communication:
  • Students who have no work to share are required to talk first. They can read the problem or directions out loud and talk about how they might start the work. They can share what they don't understand about the work. This holds them accountable to the group thinking process without judging them for not completing the assignment.
  • Students who have completed the assignment share their solutions and their thinking processes.
  • All students are expected to practice dialogue and good listening.
  • Group members cannot work on or edit their work during the dialogue. Once all group members have shared, students have a few minutes to revise or continue on their work.
During these group dialogues, I monitor conversations, ask questions to help settle mathematical disputes, and look for worthwhile artifacts to choose for whole-group sharing.

Whole Class:
Standards of communication are also important when problems are discussed as a whole class. During these whole-class discussions:
  • The presenter uses a pointer to visually track on screen the part of the problem that she or he is explaining.
  • The presenter must call on students by name when questions arise.
  • The class is required to provide some kind of feedback to the presenter before she or he can sit back down.
    During whole-class discussions, I retreat to the back of the room or sit with the students so that the presenter talks to the class and not to me.

Methods of Communication

Whole Class:
Class discussions can create a give and take atmosphere and engender a sense of community. Students need to be taught how to provide assistance and offer support to a struggling peer, to politely challenge an idea, and to accept constructive criticism. I help students develop these communication skills by:
  • Intervening in discussions, as necessary, to model appropriate communication
  • Posting and publishing sentence stems to remind students of acceptable options for starting a comment
  • Encouraging anxious students to bring a partner or an entire table group with them when presenting in front of class

Table Groups:
To facilitate trust and equity, I start the year by teaching a protocol from the Teachers Development Group called the *Mathematician and the Inquirer*. This protocol emphasizes the skill of good listening over "serial sharing." In the protocol:

- One student, the Mathematician, explains his or her solution
- Another student, the Inquirer, asks questions as necessary to clarify the Mathematician's explanation
- The Inquirer paraphrases what the Mathematician has said
- The two students reverse roles for the same problem
- Both participants continue with an open discussion

At the beginning of the year, discussions between students are very deliberate and even timed. As the year progresses, students become skilled at regulating their conversations themselves.

To encourage equity and participation in each day's journal work—the daily work on the lesson—I assign a group role to each student. Each group has a Manager, Organizer, Advisor, and Summarizer. These roles rotate.

The *Big Brain* protocol featured in the video is another method of communication. In this protocol:

- The question is read aloud
- Possible solutions are discussed
- Team members publish their individual thoughts using evidence
- Students review each other's work and offer advice as needed

In addition to these methods, I also use other familiar communication protocols including: the *Go Around, Think-Pair-Share*, and *Numbered Heads*.