Jigsaw Puzzle

Goal:

This lesson identifies a few important issues in parallel computing, using humans working on a puzzle as an analogy.

Materials:

- 1 Jigsaw Puzzle
- Something to take notes with, 1 per student

Activity:

1. Each student is given the task of taking notes, observing what the instructor and volunteer students are doing. All students begin taking notes.
2. The instructor asks one student to volunteer. That student begins solving the jigsaw puzzle. All other students continue to take notes about what the instructor is doing and what the volunteer is doing.
3. After a few moments, the instructor asks another student to volunteer. That student begins helping solve the same jigsaw puzzle. All other students continue to take notes about what the instructor and volunteers are doing.
4. After a few moments, the instructor asks another student to volunteer. That student also begins helping solve the puzzle, and all other students continue to take notes about what the instructor and volunteers are doing.
5. At some point, the puzzle will be finished. The instructor thanks the volunteers and asks a few questions:
    - What did you observe the volunteers doing during this activity?
    - What did you observe the instructor doing during this activity?
6. The instructor breaks up the puzzle and again asks for a volunteer. That volunteer begins solving the puzzle. All other students start taking notes again about what the instructor and volunteer are doing.
7. A few seconds later (a shorter pause than the last time), the instructor asks for another volunteer to help solve the puzzle. All other students continue to take notes.
8. A few seconds later, the instructor asks for another volunteer. Then another. This continues until there are 6-8 volunteers. All other students continue to take notes.
9. At some point the puzzle will be finished. The instructor thanks the volunteers and asks a few questions:
    - What did you observe the volunteers doing during this activity?
    - What did you observe the instructor doing during this activity?
    - What was different about the way we did the activity this time?
    - Which was a more effective way to solve the puzzle? Why?
    - In what ways do you think this is like a parallel computer?

10. The entire activity is repeated, but first the instructor places half of the puzzle on one side of the room, and the other half of the puzzle on the other side of the room. All students write out not only what they observe, but also what they **expect** they will observe. At the end of the activity, the instructor thanks the volunteers and asks a few questions:
    - What did you observe? Did anything happen during the activity that you did not expect?
    - In what ways was this way of solving the puzzle different?
    - What would be some other ways of solving the puzzle?
    - In what ways do you think this is like a parallel computer?