Matter Matters Post-Lab Lesson
Phase Change Charades

Overview:
This post-lab lesson requires students to demonstrate their understanding of phase changes by constructing a kinesthetic model of a phase change. During the lesson, each team of students will be secretly assigned one of six possible phase changes. Students are then challenged to "act out" the phase change by representing the particle nature of matter before the change and subsequently after the change. Those students not directly involved in a particular phase change will act as the audience and try to determine what phase change is being represented.

Materials:
6 index cards
Marker
Large open space

Getting Ready:
On each of the note cards, write the name of a different phase change (i.e. freezing, melting, evaporation, condensation, sublimation, and deposition.)

Make sure students are divided into their teams as they were for the mission (Alpha, Bravo, etc.)

Procedure:

1. Have students assemble with their team members in a large open area. Make sure teams are spread out enough that they cannot hear what another team is discussing.
2. Give each team one of the note cards containing a name of a phase change.
3. Explain to students that their job is to act out the phase change written on the note card. The students should represent how the particles of matter would behave and be arranged both before and after the phase change. If students need to refer to Page 1 of their Lab Journals as a reminder of how solid, liquid, and gas particles are arranged and behave, they may do so.
4. Give students a few minutes to discuss with their teammates and develop a game plan. As the teams are discussing, walk around and monitor their progress. Make sure they understand that they need to demonstrate how

the arrangement and behavior of particles changes during the phase change.

For example, a team assigned to demonstrate sublimation would begin by acting as though they are a solid. As a solid, students would be packed together tightly in an orderly arrangement. They have enough energy to vibrate but they do not have free range of motion because they are packed together so tightly. As the phase change occurs, students would become a gas. They would begin to move more rapidly and randomly and occasionally collide with one another or with their "container." They would spread out to occupy however much space is available to them.

5. Once all teams have had a change to devise a game plan, give them a few minutes to rehearse their plan and practice acting out their phase change.
6. Assemble all teams together into one large group. Designate a "stage" area where the charades will be taking place and make sure all students can see.
7. Call the first group up to act out their phase change. Once they are finished with their demonstration, ask for audience participation in determining which phase change was being shown. Ask students to defend their answers, forcing them to use key phase change terms. For sublimation, you might draw upon the e-Lab by asking a question such as "If team (Alpha) were representing dry ice, how cold would that solid carbon dioxide be?"
8. Once all teams have had the chance to demonstrate their assigned phase change, you might choose to mix up the cards and repeat the activity until you feel that students have a good grasp of the phase change terms and what they mean in terms of the behavior of matter.