

## Sound Cups

*Based on an activity shared by Karen Wilkinson and Mike Petrich in our Summer Institute, 2004.*

### **California State Science Content Standards:**

Every grade level includes an “Investigation and Experimentation” group of standards. In this activity, students ask meaningful questions and conduct careful investigations.

### **Materials:**

Opaque plastic drinking cups (3 per student)

Masking tape

Small objects to put inside cups

For example: paper, paper clips, brads, push pins, pennies, marbles, pencils, straws, rubber bands, string, cotton balls, cotton swabs, washers, smaller cups

Tray for each table

**To Assemble Ahead of Time** (about 1 hour of prep for 30 pairs of cups, but you can use them over and over):

Decide if you want students to work in pairs or larger groups. If you want students to work in pairs, you will need to make 2 identical sets of a single type of sound cup – e.g. make 2 pairs of cups containing straws, 2 pairs of cups containing a penny, 2 pairs of cups that contain washers, etc. If you want students to work in groups of 4, you will need to make 4 identical sets of a single type of cup - e.g. make 4 pairs of cups containing straws, etc.

Put the item(s) in one cup, place another cup upside down on top of it, and tape them together. Make another one exactly the same way before you start to make a different type of sound cup.

As you make the cups, make a small pile of the objects you used on each tray. Make one cup for each student.

### **To Do and Notice:**

You may want students to do the first part of this activity in silence. Pass out one sound cup to each student. Ask students to listen carefully to their cups, and then to find the person who has a cup that sounds the same. Have students listen to each other’s cups, and to sit with their sound cup partner when they think they have a match.

Once students have found their partners, they will work together to try to build an identical sound cup using the materials you provide on the trays. Put a tray of materials on each table (or at several stations). Students may talk as they try to make a sound cup that is identical to their own. They may not open their original cups as they try to make a matching sound cup.

Once students have finished building and taping their new sound cup together, have each group present their work. Each group should demonstrate the sound of the original cups, talk about what they noticed and how they decided to make the sound cup that matched their original pair. The process of thinking through this problem is important to share. As each pair shares their stories, make a list of the words they use to describe their sounds as they demonstrate the sound.

### **Dealing With Answers:**

Students will want to know if they “are right”. In science, many times we are not able to appeal to a higher authority, and we must rely on our own observations and experiments to answer our questions. This may be frustrating for your students, but it is important to emphasize this essential part of the scientific process.

### **Evaluation:**

There are three parts to the evaluation of this activity:

- 1) Do the students’ pairs of cups sound alike? In other words, did the students find someone whose cups sounds like theirs?
- 2) The other part of the evaluation of this activity is how well the sound cup that the pair created sounds like the sound cups they were given.
- 3) Writing component: have each student write about the sound that their cup made: of what did it remind them? Have them include how with their partner they created a similar sounding cup. What did they try? What finally worked?

### **Extension/Developing Science Vocabulary:**

Have the group brainstorm a list of the processes and skills they used during this activity. List the words as the students mention them, creating a visual list of the students’ actions. Try to have each student clarify the word(s) she adds to the list with an example of what she did. This list can be organized to record the students’ own scientific process.

### **What’s Going On?**

Plastic cups make wonderfully resonant chambers, allowing simple objects to sound very mysterious. Only through careful observations will students be able to make accurate matching sound cups. They may be able to make a matching sound using different objects than those in the original cups.