Sound Codes Game

Teacher Directions:

Materials

1. Instruments (we use Balloon-drums and Cuicas – you can use other instruments, or even have students drum on desks)
2. Colored Chips

Setup

Have students form small groups of 2 or 3. Each team chooses an instrument – a balloon-drum, or a cuica. Give the teams a minute to play with their instruments, encouraging them to come up with a few different ways of making sounds (e.g. balloon-drums can be tapped, or the balloon drum can be pinched, pulled, and released.; cuica’s can be used to make a longer, continuous note, or shorter pulses; etc.) Point out that with each instrument, you can feel the string, drum head, or air vibrating as it makes noise. Have them make a loud and soft sound, then draw the waves for both. Ask them what is different between the two (crest or amplitude is bigger for loud sound).

Game Play

Round 1 – What Color?
Have the teams pick one student to be the musician/code sender (they’ll switch later). The remaining student(s) will be the code receiver(s). The code sender should sit at one end of a table or desk, and the receiver(s) should sit at the opposite end.

Tell the teams that in a moment, you’ll give the code sender an chip that needs to stay hidden (behind a book, backpack, etc) from the code receiver(s). They need to come up with a code to tell their teammates what color chip they have, using only their instruments.

Once the teams are ready, give them each a chip, and have them test out their codes. Can the receiver’s figure out the chips color? Once they are successful, have them switch roles, giving them a new chip.

Round 2 – How Many?
Tell the students that in this round, it doesn’t matter what color the chips are. Instead, the code sender needs to use their instrument to tell the code receiver how many chips they have. Give the teams a few minutes to come up with a new code.
Once the teams are ready, give the code sender’s a few chips (2-8 or so), and let them try out their codes. Have the teams switch roles and play again.

**Round 3 – Color and Numbers, Together!**
Inform the students that this time, they’ll get a small handful of chips – and they now need to communicate to their team *how many of each color* they have. For example, they might have:

- 1 red chip
- 3 blue chips
- 4 yellow chips
- 1 green chip

Give them a few minutes to make a new code or alter their old ones. As in previous rounds, make sure everyone gets a chance to try both roles.

**Round 4 – Race!**
In the final round, teams will compete to see who can successfully transmit their code to their teammates fastest.

Have all the code senders line up with their instruments on one side of a long table or row of desks, and have their receivers line up opposite them. (With a large class, it may be necessary to have a few rounds of races). Inform the class that it’s very important that there be NO talking during the race, so that everyone can hear the codes being sent to them.

Give each code sender a small handful of chips, covered by a piece of paper so that they can’t see them yet. Once everyone is ready, give them a “Ready, set, go!” – and let the senders remove the paper covering their chips on “go”. When a code receiver thinks they know what kinds of chips their partner has, they must *write it down on a sheet of paper*, and hold the paper in the air (to make it easier both to see who is first, and to check their answers!). Let the students play until each team finishes. If there is still time left, have them switch roles.

**Discussion Questions**

1. What was the hardest part of sending codes to your partner? Why? What about receiving codes?
2. How did your team’s codes change from one round to the next? Did they become simpler or more complicated over the course of the game? Why?
3. Did all of the teams use the same code? What are some difference between the codes each team used?
4. Were some codes more successful than others? What made those codes work so well? Which codes were the easiest for the receiver to understand? Which codes could be sent the fastest?
5. Computers send each other information – like emails, music, or pictures – by sending a bunch of 0’s and 1’s from one computer to the next. So 01000001 would
mean something different than 01100001. How is that similar to the codes you
used? How is it different?