Straw Oboes

Materials

- Straws (1-3 for each student)
- Scissors
- Additional straws of various shapes and sizes (coffee stirrers, milkshake straws etc.)
- Sanitizing wipes (optional)

Preparation

Make a straw oboe beforehand so you can demonstrate for the students. Chew one end of the straw with your back teeth to flatten 1- 2 inches from one end. Use scissors to cut a point on the straw. Then squeeze the straw so that it is round again. The top of the straw should resemble two triangles, similar to the double reeds of an oboe. Put the pointy end of the straw in your mouth and blow hard. The two triangles should vibrate to make a sound similar to a duck. If it doesn't work, chew the straw a little more to soften the plastic and try again. This video provides a good demonstration.

Students will be more successful if they chew the straw first and then cut the triangle. You can provide wipes for cleaning off the scissors between students to prevent the spreading of germs. Or you can precut the straws and let them chew the pointy end but it is more difficult for students to get a sound this way.

Activity

Demonstrate the oboe for the students. Show them the pointy end. Ask the students to think about how they think the straw makes a sound. Then let the students share their ideas with a partner. Expand the sharing to the entire class. If they get stuck, remind them of the Engage activity from the Waves lesson (Screaming Balloons) where they learned that vibrations cause sound.

Next provide the student pairs with straws and a pair of scissors and challenge them to reproduce the sound. Once they have done this, have them investigate using additional straws to find out the relationship between straw size (both length and diameter) on the pitch of the sound.

After 10-20 minutes combine the pairs into groups of four to share their findings and again, expand the sharing to the entire class. Students should find that a shorter straw (or shorter wavelength) makes a higher pitch regardless of diameter.

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How Pipe Organs Make Sound video

UNC-TV's Frank Graff takes you inside the organ of Raleigh's Holy Name of Jesus Cathedral in this 5-minute video. The pipes in the video are similar to the straw oboes that the students made and investigated. A viewing guide is available for students to complete during the video or to guide a class discussion afterwards. The answers can be found at the following points of the video.

How Pipe Organs Make Sound

1. How many pipes are in the pipe organ? (1:42)
2. What are the pipes made out of? (1:47 – 2:06)
3. What shape pipes did you see? (2:00)
4. What determines the pitch of the pipe? (2:20)
5. How long is the largest pipe? What is special about the sound it makes? (2:55)
6. How big is the smallest pipe? (4:15)
7. What does 16 Hertz mean? (3:00)
8. How does air get through the pipes? (3:20)
9. How long does it take to make the pipes for the organ? (4:27)
10. How long does it take to voice or tune the pipes? (4:37)
11. What is the title of the person who makes sure the organ makes sound properly? (Mentioned several times – a voicer)

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