

Science Demonstrations about the early singing voice-Early vocal cords

By Abram Cosby

Elementary Science, Escuela Campo Alegre

Door Harp

Objective: demonstrate that an excess of volume can distort pitch

Materials:

- Door
- Length of rope sufficient to go around the door 2 and ½ times
- Block of wood for harp bridge

Set up:

1. Tie a rope to the outside door handle
2. Wrap the rope around the door twice
3. Pull rope tight and tie to inside door handle
4. Insert block of wood as a bridge at bottom of door

Demonstration:

1. Pluck the string softly but with sufficient force to create a vibration and tone.
2. Vary the length of the string to demonstrate higher and lower pitches
3. Pluck the string hard and listen to the distortion in tone

Discussion:

When a string (or Larynx) is vibrated to excessive amplitude the wave lengths are not able to resonate properly for the length of the string.

Grass Reed

Objective:

1. Demonstrate that excessive volume can damage vocal cords
2. Demonstrate that excessively volume can changes pitch

Materials:

- Blades of Grass

Set up:

1. Pick a length of grass that will stretch between the first knuckle of the thumb and the fleshy part at the base of the thumb
2. Stretch the grass between the thumbs on both hands pulling the blade taught and giving a space for air to pass over the blade vibrating it like a reed.
3. Blow air over the blade of grass to create vibration and sound.

Demonstration:

1. The more air that is blown over the reed the louder the sound
 - a. As the reed gets louder the pitch also increases
2. Too much air blown over the reed will tear the grass blade
3. Tighten and loosen the grass blade's position between the thumbs and observe that the tighter the blade of grass the higher the pitch.

Discussion:

- By seeking more volume from a vibrating reed (or larynx) the added air not only increases the volume (amplitude) but often increases the pitch (frequency) as well.
- Over exertion through too much vibration can damage the reed.
- Within the appropriate range of the reed different pitches can be obtained.

Yarn guitar string

Objective:

Demonstrate that once a string is stretched it will not return to the original length. This activity reinforces the idea that damage to a larynx can be permanent.

Materials:

- Yarn
- Chair to tie yarn around

Set up:

1. Tie a loop in one end of a piece of yarn
2. Wrap the yarn around the chair and through the loop
3. Pull taught

Demonstration:

1. Mark the yarn at the place where it passes through the loop.
2. Pluck the yarn
3. Tighten the yarn to gain a higher pitch and pluck the yarn.
4. Return the yarn to the first mark and pluck again.

Discussion:

The yarn will give a pitch at the first mark when plucked the first time. When the yarn is stretched the fibers tighten to give the higher pitch but will not expand back to the original length for the lower pitch. Some participants may notice that pulling too tight or plucking too hard may result in the yarn breaking. When a higher or louder pitch is forced from a developing larynx it can damage the larynx.