



Curiosity Guide #608

Piano Science

Accompanies Curious Crew, Season 6, Episode 8 (#608)

Action Test

Investigation #8

Description

Let's test a piano's action system for quality!

Materials

- Piano

Procedure

- 1) Play a single note on the piano.
- 2) Gently try to play the note twice in one second.
- 3) Could you do it? Did the piano play the note twice?
- 4) Try the investigation again with quick, gentle repetitions.
- 5) Could you hear the individual beats of the sound?

My Results

Explanation

Pressing down on a piano key activates the piano's action, a complex lever system that causes a hammer to strike an open string and then quickly dampen the sound. The hammer head can resemble a real hammer; however, the head is made of dense wool felt so as not to hurt the strings. There are hundreds of moving parts in the piano's action, and how these parts work together determines the quality of the piano. A good-quality piano can play a single note up to eight times per second, and each sound should be clearly heard.

Investigate further. (You will need two graphics of piano action parts—one for a grand piano, and one for an upright.)

Have you wondered about the differences in how an upright piano works compared to a grand piano? In both the grand piano and the upright, pressing down a piano key triggers the piano's action. The silencing damper lifts off the string and causes the hammer to strike the string to make the sound. In a grand piano, that means that the hammer moves UP to hit the strings because the strings are horizontal. In an upright piano, the hammer springs FORWARD to hit the strings because the strings run up and down. An upright piano is a grand piano turned upright. That means that the soundboard, bridge, and strings are turned so that the strings run up and down rather than horizontally. Either way, that action is amazing!

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