Curiosity Guide #608
Piano Science

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

Piano Action

Investigation #7

Description

A piano's keys are just the tip of the iceberg. Let's investigate!

Materials

- Piano action assembly
- Piano
- A friend

Procedure

1) Examine the piano action while pressing the key.
2) Can you explain how the action works?
3) Try to trace the moving parts to see how one motion leads to another.
4) Look in the piano to try to see some of the action at work.

My Results

Explanation

Each piano key is a long lever that goes into the piano. When a key is depressed, or pushed down, two things happen at the other end of the lever. First, the damper, which is a small felt pad, gets lifted off the string. Normally, when the damper is touching the string, the string won't vibrate and produce sound, so pressing the key lifts that off in the open position. The second thing that happens is that the movement pushes up on an arm called the whippen body, which lifts another part on the end called the jack. Together, the whippen body and the jack get the hammer moving forward. The hammer strikes the strings from its own momentum. The hammer can then bounce back into position, ready to strike again.

The hammer is not in contact with the key itself but responds to all the other moving parts to begin moving. This motion is called the first escapement. Even though the key may still be pushed down, the hammer has already struck and bounced back, independent of the key position. Once the pressure is off the key, the damper silences the string again.

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