

Spoon Bells

You won't believe these vibrations!

WHAT TO DO

Wrap the strings around your index fingers so that the spoon hangs between them, then put your fingers in your ears and let the spoon dangle without touching anything else. Have someone tap the spoon and listen.

WHAT'S HAPPENING?

Tapping the spoon makes it vibrate, or move back and forth very rapidly, sending sound waves of various frequencies through the air which strike your eardrums so that you hear them. But the vibrating spoon also makes the attached strings vibrate, and since the strings are wrapped around your fingers the bones vibrate as well. When you press your fingers to your ears these vibrations also couple to your skull, sending the vibrations as sound waves directly to your eardrums. These sound waves have now reached your eardrums by traveling only through the various solid materials (spoon to string to bone to skull to eardrum), and not through the air. Not only that, but with your fingers plugging your ears, almost none of the simultaneous sound waves in the air (which are the only ones everyone else can hear) will reach *your* eardrums. As you can now tell, the various frequencies which travel best through solids are very different from those which travel best through air, so the spoon sounds very different—more like a large gong or church bell.