HARMONY SCIENCE ACADEMY

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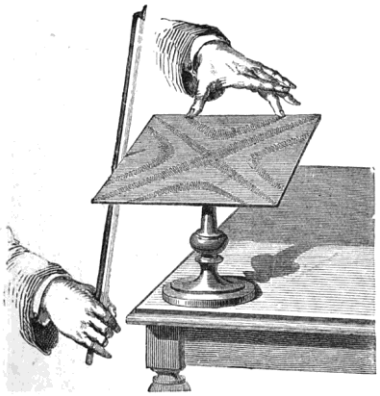
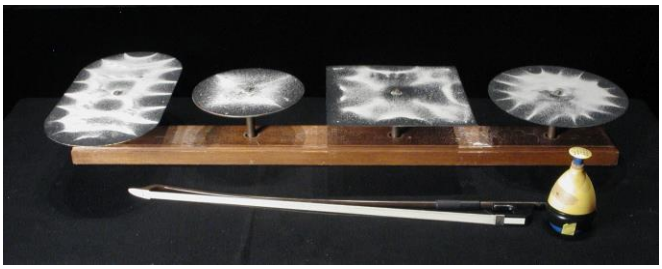
Chladni Plates



Who created Chladni Plates? When were they created?

Today imagining sound as waves is common, because what else could it be? In reality it took experimentation, revision, and observation plus more experimentation by many scientists before this conclusion and understanding of sound was achieved. Ernst Chladni, an 18th century scientist and musician, was one of these contributors- especially on knowledge of vibration and acoustics- who furthered the study of the movement of sound and other fields of science. After he created and experimented with his namesake invention Chladni Plates in the 1800s, he came to be known as "The Father of Acoustics."



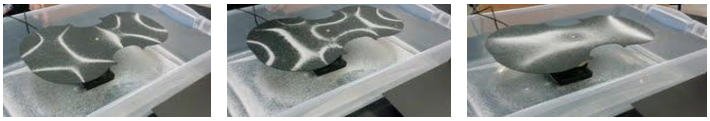
What are Chladni Plates? How do they work?

Basically Chladni plates are thin metal plates. The reason Chladni used metal was so he would be able to see the different patterns made (in essence the movement of sound) from sand he put on the plate once he ran a bow down its side. As a result Chladni clearly demonstrated that sound traveled in waves, and was the first scientist to do so. His experiment also debunked the common conception that sound moves between particles of matter (empty space) rather than matter, the fact that the vibrations from the bow traveled through the metal plate and shaped the sand disproves this.

What science is involved?

Chladni Plates are all about the principles of resonance and acoustics. Acoustics is the study of the physical nature in sound and resonance is what causes an object to move up and down and back or forth (oscillate), in this case the object is sound. The scientific principle primarily behind Chladni Plates is that of sound and how it moves and his experiment proved that sound and waves have a connection.

In the 18th century Chladni used a violin bow to strike against the metal plates and produce patterns. These patterns proved that sound moved in waves through most mediums including metal. Sound is able to travel through solids, liquids(demonstrated by blowing on the top of a glass filled with water which will then produce ripples indicating that the vibrations caused by your breath did this), and air(which is quite obvious if you have ears, meaning you can hear when someone speaks).



The areas where the sand collects on the plate are the nodes in between the moving waves.

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Safety Precautions:

Typically silica sand is used on the plates, but no matter what kind of sand is used, so please make sure to wear goggles to protect your eyes from any stray sand when it is moving. Silica sand especially can cause cancer if ingested, and irritation if caught in eyes.