

DIY Record Player

Simple STEM Activities You Can Do at Home

Purpose:	The purpose of this activity is to construct a simple record player that vibrates to produce music from a vinyl record.
Standard:	<p>S4P2. Obtain, evaluate, and communicate information about how sound is produced and changed and how sound and/or light can be used to communicate.</p> <p>a. Plan and carry out an investigation utilizing everyday objects to produce sound and predict the effects of changing the strength of vibrations.</p> <p>S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.</p> <p>d. Develop and use a model to compare how light and sound waves are reflected, refracted, absorbed or transmitted through various materials.</p>
Materials:	Old record, paper, straight pin or needle, tape.
Procedures:	<ol style="list-style-type: none"> 1. Roll a piece of paper into a cone shape. Tape the paper together. 2. Poke a straight pin or needle through the paper at the narrow end of the cone at about a 45 degree angle. 3. If needed, tape the pin on the top of the paper to secure it. 4. Poke a pencil into the record and make sure it is tight. Add tape if needed. 5. Spin the record in a clockwise direction. Try to get spinning evenly. 6. Holding the paper cone on the far end, gently place the pin on the record. 7. Listen for the music. Try spinning the record at different rates and see what happens to the sound. Full size records are designed spin at 33 revolutions per minute. 8. Practice your technique and see if you can improve the quality of the sound.
Science Behind It:	<p>When objects vibrate, they produce waves that travel through the air. When these waves enter the ear of the listener, they can be interpreted as sounds. Records are designed to vibrate in patterns that reproduce music that is created by musicians. Records are made of a type of plastic called vinyl and each record has a set of tiny grooves stamped into them. Each song has one groove that forms a spiral that goes around and around. Each groove has bumps and ridges and, as the needle rises over them, it vibrates in musical patterns. The vibrations from the needle then pass to the paper cone and both of these produce sound waves that travel to your ear. The paper cone also acts like an amplifier which makes the vibrations sound louder. While the musical vibrations lack the quality of a commercial record player, you should be able to recognize what songs are being played. Large records are designed to spin at 33 revolutions per minute so try to spin your record at that rate if you want to hear the most realistic sound.</p> <p>Don't use your best records because you might scratch them up just a bit.</p>
Questions to Ask:	<ol style="list-style-type: none"> 1. Explain why your record player was able to vibrate and produce sound. 2. What happened to the sound when you changed how fast you spun the record?

