

Science
MAD!

The fun way to learn

Ages **8+**

Build your own paper cup speaker to transform electrical signals into sound!

PAPER CUP Speaker



Safe, Educational Experiments

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PAPER CUP Speaker

Contents:

1 wire coil with exposed wire ends, 1 disc magnet, 1 audio plug & cable with exposed wire ends, 1 sheet of adhesive tape strips. You will also need a paper cup (Not included).

Instructions:

1. Gently peel off two adhesive tape strips and cut them in half to make four short pieces of adhesive tape.
2. Obtain a clean, dry paper cup. Stick the coil to the centre of the bottom of the cup with the adhesive tape as shown, without covering the two loose ends of the wire. Make sure the coil is firmly secured to the cup.
3. Place the magnet on the bottom of the cup and carefully adjust the position of the magnet so it is centred within the coil. Fix the magnet in position with 2 long strips of adhesive tape. Twist one of the loose wires from the coil to one of the wires connected to a plug, then twist together the other loose wire from the coil to the other plug wire. Note that the coil is covered with a protective brown layer, which is non-conductive insulation. Only the silvery wire at the end of the coil should be used to connect to the audio plug. When you have twisted the wire ends together, cut two pieces of adhesive tape to 2cm long and wrap them around the two twisted wire joints to insulate them and avoid short circuit.
4. Connect the audio plug to the output of any portable music device and hold the cup close to your ear. Play the music and turn the volume up slowly until you can hear the sound. Your paper cup loudspeaker is completed! You can also try this experiment using a paper plate or bowl to see what happens and if it works differently.

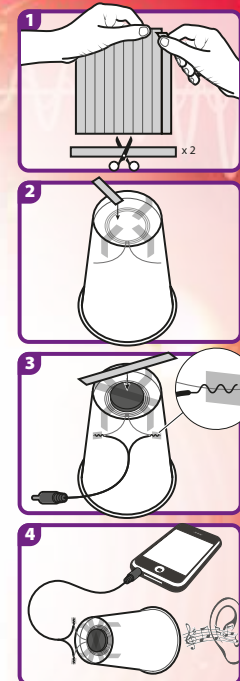
If you have a problem:

If your paper cup speaker is not working, please check:

1. If the ends of the plug wires are connected securely to the wires from the coil.
2. If the connected ends are touching each other, which may cause a 'short circuit'.
3. If the silvery wire at the end of the coil is broken. If so, use fine sandpaper (not included) to remove the protective brown layer to expose about 1.5cm of wire to reconnect to the audio plug cable.

Did you know?

- The first working loudspeaker was patented by Alexander Graham Bell in 1876 because he needed to find a way to generate sound for the telephone.
- Human ears detect sounds in the audio band, generally in the range of 20 Hertz (Hz) to 20,000 Hz.
- As we get older, our hearing gets worse due to genetics, exposure to noise, or illness.
- Your ears continue to function and pick up sounds while you are sleeping, but your brain blocks out most of them.



WARNING! Only for use by children over 8 years old. To be used solely under the strict supervision of adults that have studied the precautions given in the experimental set. Not suitable for children under 36 months due to small parts. Choking hazards. This toy contains functional sharp point – on the component leads. The wires are not to be inserted into socket outlets. Use with care and only under supervision of adult. Not suitable for children under 8 years. This product contains small magnets. Swallowed magnets can stick together across intestines causing serious injuries. Seek immediate medical attention if magnets are swallowed.

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Adults, please read the enclosed manual before use as it contains important information.

Please retain this information for future reference. Contents, colour, designs and decorations may vary from those shown in the photographs.



AGES 8+
Made in China

Item No. SM34

