

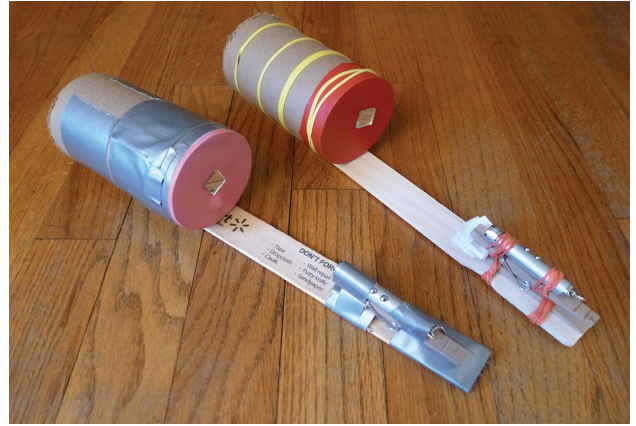
“O-Silly-Scope”

An **oscilloscope** (*oh-sill-oh-scope*) is a machine that lets you see sound waves. The sound waves are analyzed and then turned into a picture on a screen, usually a transverse wave where the crests get larger or smaller according to the pitch or the loudness of the sound. Very high sounds will create tiny waves that are close together and low sounds will make large waves that stretch out horizontally.

This “o-silly-scope” is a silly way to see sound waves.

There aren't any fancy parts that translate the sound waves into pictures. This is a direct mechanical to mechanical translation.

The sound vibrations of your voice make the stretched balloon vibrate. The mirror stuck to the balloon will also vibrate as a result. The laser pointer bounces off the mirror and lets you see how the mirror is moving. Thus, the sound of your voice will make the laser pointer create a pattern on the wall.



You will need:

1) A cardboard tube of some kind

NOTE: The exact diameter doesn't matter; you can use a sturdy paper towel tube, a mailing tube, a small canister such as a baking powder can, or even a small oatmeal container. Larger tubes will respond to lower voices. I found that smaller tubes work slightly better for kid voices.

2) A balloon (minimum 12" diameter size)

3) A tiny mirror (I got mine at a fabric/craft store. The package was only 99 cents.)

4) A clothespin (I found that the wooden ones work best.)

5) A small laser pointer (I got mine at a dollar store for only one dollar.)

6) A long, flat stick

NOTE: A cheap wooden ruler is perfect, but a paint stirrer is also fine. If you use a plastic ruler make sure it is very stiff (not bendable). You could also use a piece of a yardstick, or a piece of any other wooden stick you happen to have around.

7) Some duct tape or masking tape

8) Some rubber bands (a few skinny ones and a few slightly heavier ones)

9) A glue stick (heavy-duty, not the “school” kind)

10) A small object to adjust the clothespin. (You can determine what you need after assembly is complete.)

How to assemble:

1) Cut the stem part off the balloon so you can stretch the balloon over one end of the cardboard tube. Stretch it just enough to get rid of wrinkles or bumps. Don't over stretch. Secure it in place with a rubber band.

2) Rubber band (or tape) the tube to one end of the flat stick. Make sure that the open end of the tube is at the end of the stick and the covered part of the tube is facing the middle of the stick.

3) Put the laser pointer onto the clothespin with the laser end at the “pinchy” end of the clothespin (not the handle part). Secure with either rubber bands or tape. Make sure not to cover the on/off button of the laser.

4) Secure the clothespin to the other end of the flat stick, using either rubber bands or tape.

5) Turn on the laser and see where it hits the balloon. Find a small object to put into the jaws of the clothespin so that the laser will hit the balloon just above the middle. (You might want to secure this object with tape so that it doesn't fall out.)

6) Once you see where the laser hits, put some glue stick onto the back of the tiny mirror and secure it to the balloon right at that spot.

How to use the scope:

Point the scope at the wall so that when you turn on the laser beam, you can see the red dot on the wall. Talk, sing, or yell into the tube and see what patterns will be created by the red light. For very high sounds, the dot may remain as a dot. For some low sounds you might see a circle, an oval, or a long line. If you make a raspy sound (like clearing your throat) you will see a very scattered pattern. This is the silly part-- try all kinds of sounds and see what happens!

Single notes will produce identifiable shapes. If you play loud music into the tube, you will see a much more complex pattern, not single shapes. You can use your favorite music to make a laser light show for your friends.