# Steady Hand Game

How to Build It:

Materials:

☐Foam board	☐Electrical tape or black duct tape	☐Copper wire, uninsulated
☐Plexiglas square	☐LED light	☐Paperclip for a wire loop
☐X-acto knife	☐1K Resistor (black, brown red)	☐9V battery
☐Black Construction Paper	☐Soldering iron	☐9V battery snap
☐Glue stick	☐Solder	☐Scissors

Procedure:

1. Attach the paper to the board using a glue stick and cut construction paper to fit on the foam board.

2. Scratch your message onto the Plexiglas "Game Over" or "Try Again"

3. Position the Plexiglas to one side of the foam board as shown in the picture below. Tape 3 sides of the Plexiglas to the board like in the image.
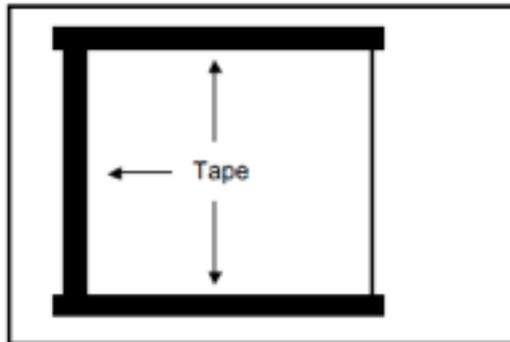

4. The LED has two legs, one is SHORT; one is LONG. Figure out which side is which and read the next directions carefully!

5. Solder together the RESISTOR and the LONG leg of the LED.

6. Solder the side of the LED without the resistor attached to it to the negative (BLACK) wire on the battery lead
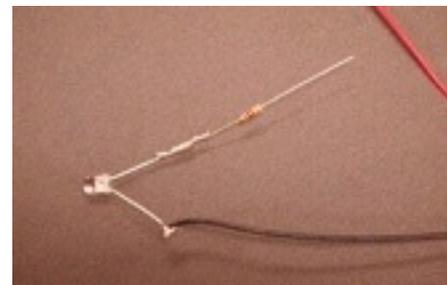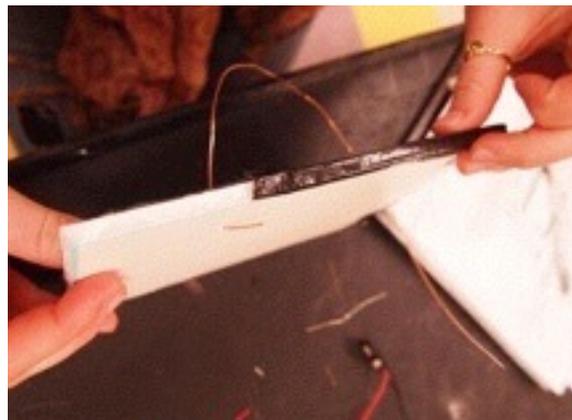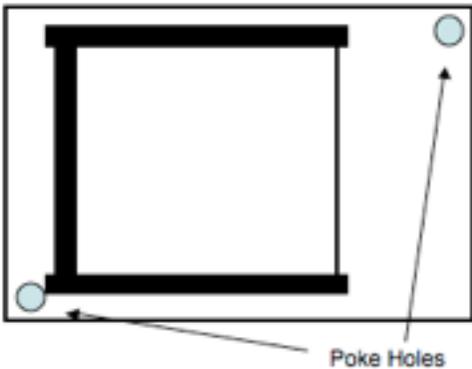
7. Find the Loop. Solder the straight part to POSITIVE (RED) wire on the battery lead. Cover the solder with a small piece of tape.

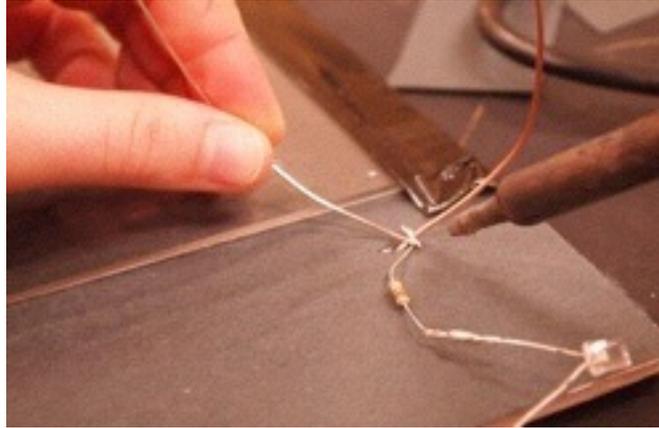1. The finished battery lead should look like this:
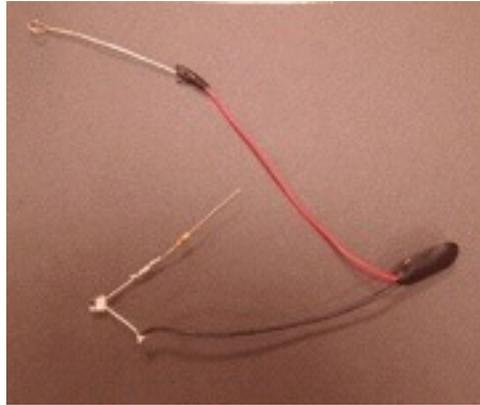
8. Poke holes in opposite corners of the foam board like in the picture below

Poke Holes

10. Make a hook with the leg of RESISTOR attached to the LED and hook it around the copper wire.
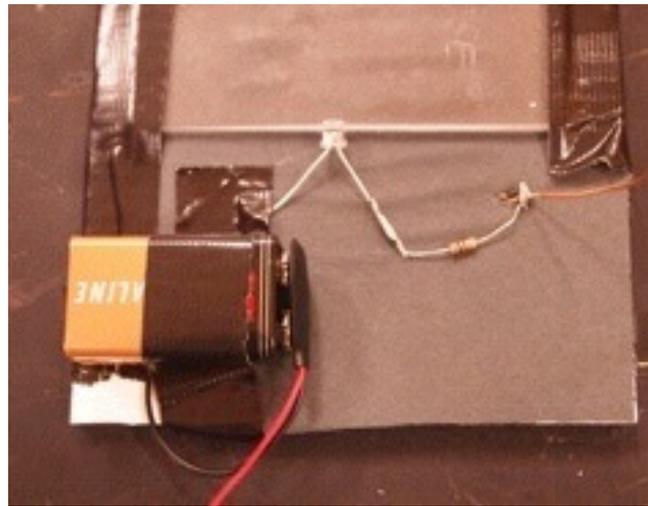
11. Solder the leg of the LED that has the RESISTOR attached to it to the copper wire sticking out of the corner of the foam board.
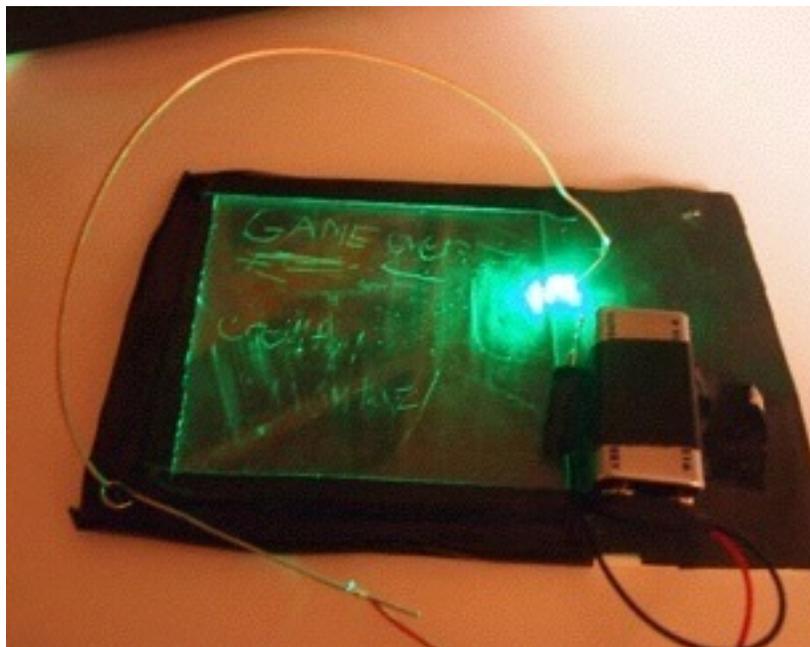

12. Bend the copper wire into a zig-zag design to make the game more challenging.

13. Unbend the wire loop a little bit to slide it over the copper wire.

14. Attach the battery and tape the last side of the Plexiglas with the LED and battery in place.

15. PLAY!

How it Works:

The 9V battery supplies power to our circuit. We want to use an LED for the cool effect that it gives the plexiglas, but the 9V battery is too powerful for one LED light. To power down the battery and slow the current through the light bulb, we have to attach a 1K resistor to the LED. This gives us maximum brightness without burning out the bulb! The circuit is normally open when the game is not being played. When the wire loop touches the copper wire that stretches across the game board, the circuit is closed and the light turns on showing the secret message on the piece of plastic!

Experiment!

How can you make the game harder? What makes the game easier?

How do other colors of light show up in the plastic?

The light shows up best in a dark room, but that also makes it harder to see the game to play it. How can you change the game to make it easy to play in a bright room, but still show something cool when you bump the wire with the loop.