

Magic Wand

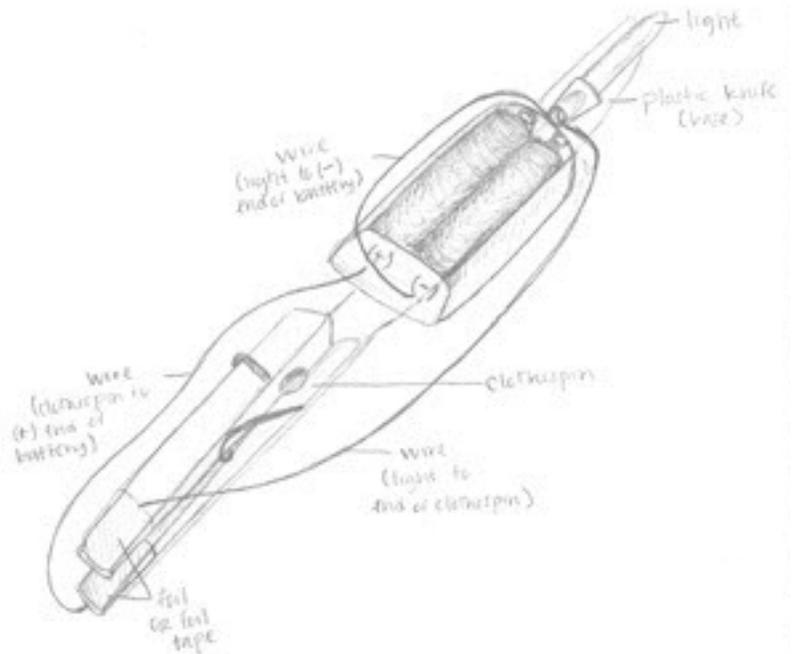
How to Build It:

Materials:

- | | | | |
|--|--|-----------------------------------|---|
| <input type="checkbox"/> Plastic knife | <input type="checkbox"/> Clothespin | <input type="checkbox"/> Wire | <input type="checkbox"/> Soldering iron |
| <input type="checkbox"/> AA batteries | <input type="checkbox"/> Christmas light | <input type="checkbox"/> Hot glue | <input type="checkbox"/> Tape or rubber bands |
| <input type="checkbox"/> AA holder | <input type="checkbox"/> Tinfoil tape | <input type="checkbox"/> Solder | |

Procedure:

1. Get a battery pack, batteries, and a Christmas light. Make sure the Christmas light works!
2. Use two small pieces of tinfoil tape to wrap the ends of the clothespin. The tinfoil should not touch when the clothespin mouth is closed. When the clothespin is squeezed and the mouth is open, the tinfoil pieces should touch.
3. Use another small piece of tinfoil tape to attach the red wire from the battery pack to the tinfoil on one side of the clothespin.
4. Use a small piece of tinfoil tape to attach the extra wire to the other side of the clothespin.
5. Use hot glue to attach the clothespin to the handle of the plastic knife. Make sure that the mouth side of the clothespin is facing in to the middle of the knife and the handles of the clothespin, with the tinfoil, are facing the end of the knife handle.
6. Use solder to attach the Christmas light to the black wire on the battery pack.
7. Use hot glue to attach the battery pack to the middle part of the knife, above the clothespin.
8. Use solder to attach the extra wire on the clothespin to the second side of the Christmas light.
9. Use hot glue to glue the Christmas light to the tip of the knife.
10. Use duct tape to keep the wires in place.
11. Squeeze the clothespin to test the wand!



How it Works:

The Magic Wand takes a basic circuit of batteries, wires, and a light bulb and breaks it into two parts. We put the clothespin in the wand to create a simple switch. The wires of the circuit connect to the ends of the clothespin, which are wrapped in tinfoil, a conductive materials. When the end of the clothespin is apart (a.k.a. when the clothespin is shut) the circuit is open and the electricity is stuck. When the mouth of the clothespin is open (a.k.a. when you are squeezing the handle) the circuit becomes closed because the two pieces of tinfoil are touching and the electricity is free to complete the circuit. Voila! Light! Not really magic, but some pretty simple science.

Experiment!

Can you attach a second light bulb? A third? A fourth? Do they all have the same brightness?

Can you attach things other than a light bulb to the wand?