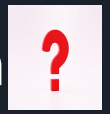
Flashlight Build

Flashlight Build:

We are doing a flashlight build. We are going to use batteries, cardboard, and 1.5V lights. Our experiment is to make a flashlight out of specific materials and track how long the light beam is based on the shape of the reflector. We will be making a flat reflector and a curved reflector to see which one makes the light go farther. Based on our research, we believe that the curved reflector will make the flashlight beam go farther because the light hits all the sides and the bottom.

Testable Question 

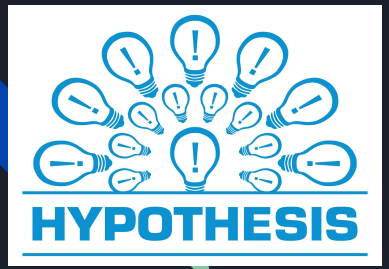
Testable question: How does the shape of the reflector affect how far the flashlight beam travels?

Independent Variable: We are changing the shape of the foil reflector.

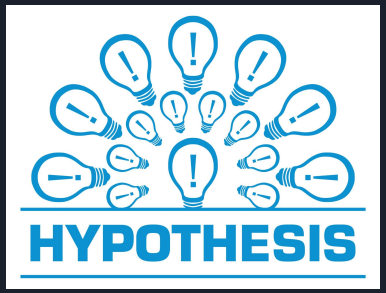
Control: We are comparing flat v.s. curved tin foil reflector.

Dependent Variable: How far the light travels.

Constant Variables: our design for our exterior, the length of the wire, the light switch, the battery type, the light bulb type, the light bulb holder, switch, and electrical tape



Hypothesis



The hypothesis for this experiment is: If we change the flat tin foil reflector to a curved tin foil reflector, then it will make the flashlight beam travel farther than the flat tin foil.

We think this because you would have to adjust the shape of the reflector for the light to go farther. Also, because flat would bounce the bottom light, but curved would bounce the bottom and sides. Lastly, curved makes all the light out which adjusts the light volume/ watts.

Materials List

Cardboard Strip 7 inches by 4 inches

Cardboard disc with a diameter of 3 inches (1 curved and 1 flat)

Cardboard Strip 6 Inches by 1.25 inches

1 light switch

1.5 V light bulb

1.5 V light bulb holder

1 AA battery holder with 1 positive red wire and 1 negative black wire attached

1 positive red wire 24 G (15 cm)

Electric tape

AA Rayovac Battery

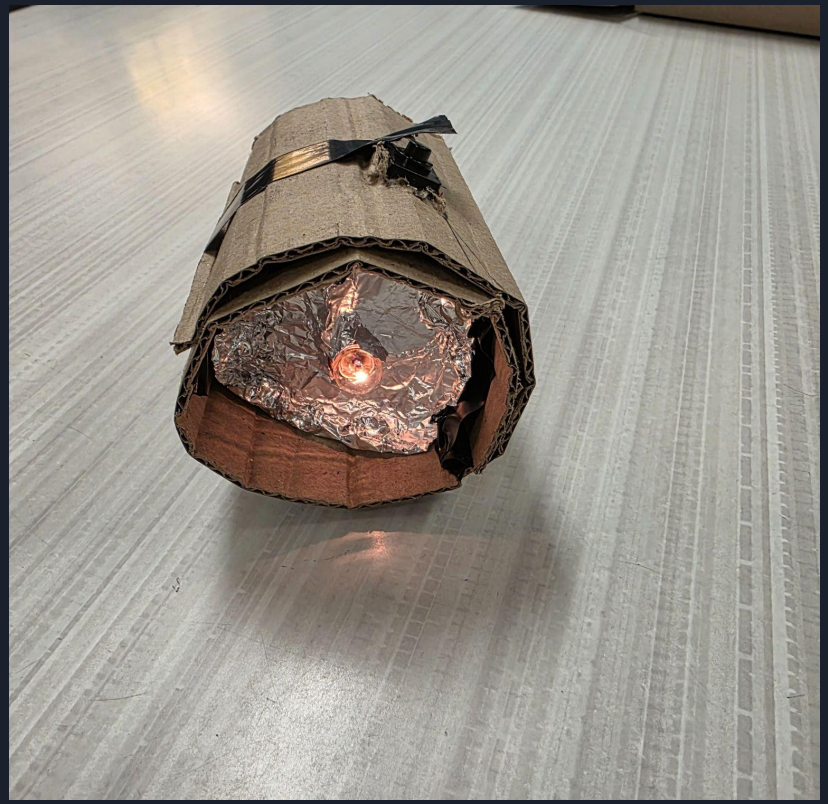
Tinfoil reflector.

Chromebook to Record the data

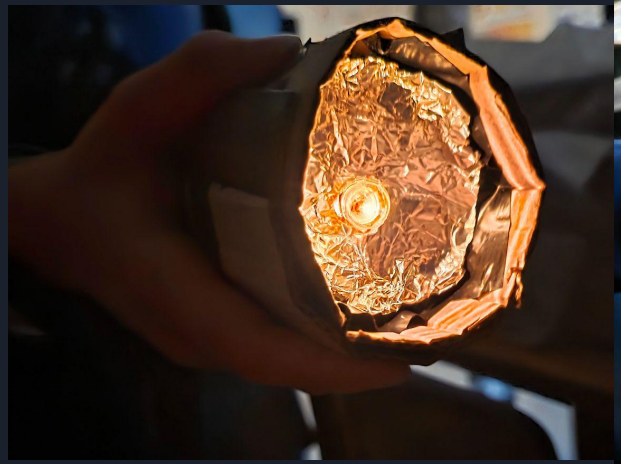
Procedure List

1. Gather the materials.
2. Puncture 1 hole into the cardboard disc.
3. Insert the light bulb holder into the hole.
4. Then wire the light.
5. Then wire the positive (one that wires two rows) to the positive part of the battery.
6. Then connect the wire that does one row the negative part of the battery.
7. Next, connect the switch to the wires.
8. Put the circuit into a cardboard tube.
9. Put the tin foil covering the flat disc interior and put it in the tube.
10. Switch it on.
11. Turn off the lights and measure the beam with a ruler.
12. Record the data in the chromebook.
13. Repeat steps 1-12, changing to the curved reflector.

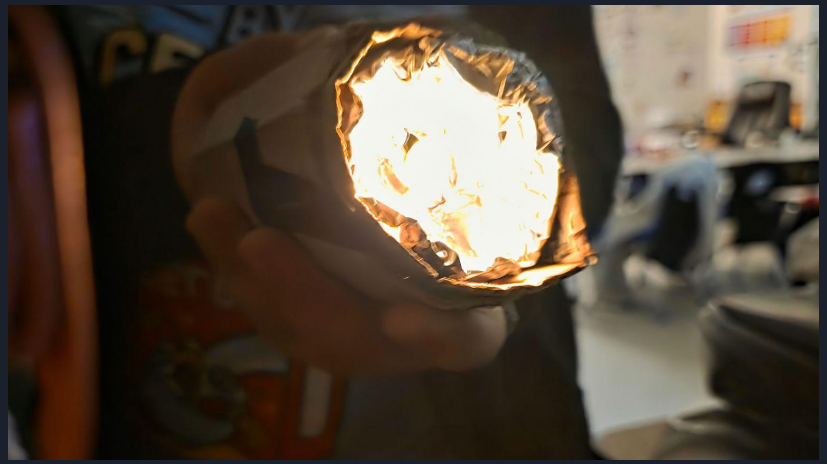
Experiment Pictures/Data Table - Flashlight with Flat Reflector



Experiment Pictures/Data Table - Flashlight with Flat Reflector



Experiment Pictures/Data Table - Flashlight with Curved Reflector



Experiment Pictures/Data Table (Flashlight with Curved Reflector)

Experiment Pictures/Data Table

Shape of Reflector	Distance Light Beam Travels
Flat	1.4 feet
Curved	1.7 feet

Conclusion

The data **did** support our hypothesis. The data shows that the curved tin foil reflector made the light beam travel farther than the flat tin foil reflector.

Research Sources

https://store.marinebeam.com/beam-angle-calculator-1/

https://van.physics.illinois.edu/ask/listing/1966