

Mark Pugh
Prairie River Middle School
106 Polk St.
Merrill, WI 54452
715-536-9593 ex.324
mark.pugh@prms.maps.k12.wi.us

Special Recognition to:
Brian Schiltz – Student Teacher, UW-Stout, for the instruction sheet.

Supplies for the light box
(Total cost is less than \$1.00 per box)

Fiber optic strands:

ABS
PO Box 408
Pittsburg, KS 66762
www.absupplies.com
Catalog # B-700186 - \$2.00 for ½"x18" piece (about 100 or so strands)

9v battery clip, 9v battery lead & sliding switch:

Kelvin
280 Adams Blvd.
Farmingdale, NY 11735
www.kelvin.com
Catalog # 220013 - 9v battery clip - \$.15 ea
#27004 – SPST slide switch - \$.40 ea.
#220017 – I shape 9v battery snap lead - \$.10 ea.

Lights and wire:

Free – Old Christmas tree lights. Just ask for donations.

General Supplies:

Cardboard boxes cut into 2 ½" strips
Latex paint
A few straws borrowed from the cafeteria (~1/4" dia.)
Masking tape
Empty soda cans (2)
6" x 6" hardboard

Tools needed:

Hot glue gun
Drill or drill press
Try square
Xacto knife
Scissors
Hole punch
Sharpie pen
3/8" hole punch

LIGHT BOX



Objective: Construct a fiber optic box by using a parallel circuit.

Supplies: 1- 9volt battery with clip and leads, 1- 2-way switch, 2- lights, 2- soda pop cans (preferably diet and the same brand), extra wire, 1- 6" x 6" x 1/4" thick hardboard, cardboard, straws, fiber optic wire.

Instructions:

Lecture

1. What is electricity? What is the atom and electron? How does the electron travel? (Insulators, Conductors, Current, Open, Closed and Short Circuits.) What if nothing works? Troubleshoot & Problem Solve
2. What is the difference between a series circuit and parallel circuit? Draw diagrams of both using proper labels and symbols.

Activity

1. Obtain a piece of hardboard that is 6" x 6" and locate the center. An "A" size bit is used to drill hole (depends on straw diameter). This is where the fiber optics will come through. (Fig. 1)
2. Lay a marker on top of a 3/4" piece of stock and mark a line across the bottom of one soda can. Do the same thing with the other can; however, use a 1-1/2" (2x4) to mark the second can.
3. Cut both the cans off on the marked line (scissors work fine). On the shortest can, punch a 3/8" hole dead center on bottom. On the taller can punch two holes, one across from the other, using a paper punch. Using a razor blade, make 1/4" slices 90° apart in each of the taller can's holes.(Fig. 4)
4. Glue the shortest can to the center of the hardboard. Then glue the battery clip 1/2" away from the can (Fig. 3)
5. Cut your cardboard strips for the box. The height of the pieces should be 2-1/2". On one of the pieces cut a 1" x 5/8" hole for the switch. Use a hot glue gun to mount cardboard sides. The corners need to be glued also. Masking tape can also be used to cover the corners. Allow to dry. (Paint with 2 coats of latex paint. Be creative).
6. While paint is drying create a parallel circuit using two light bulbs, a switch, a lead, and a battery. Assemble the circuit into the box when paint is dry. (Fig.4)
7. Cut straw to 1" length. Cut 20 fiber optic strands into varying lengths and stuff into straw until fibers are tight in straw. Put a small bead of hot glue around fiber optics at top of the straw. (Fig. 5)

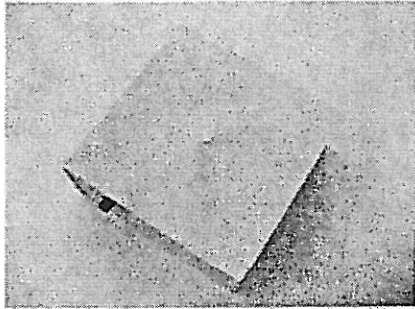


Fig. 1

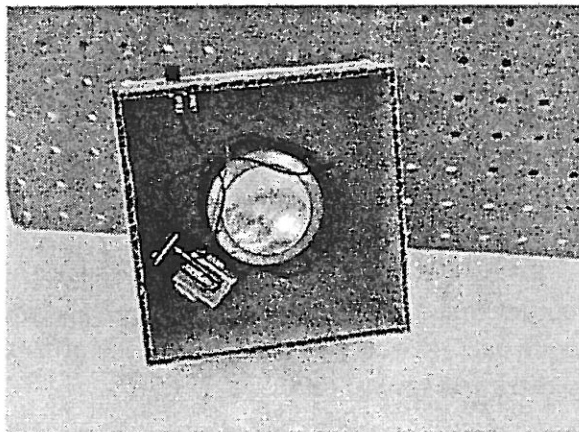
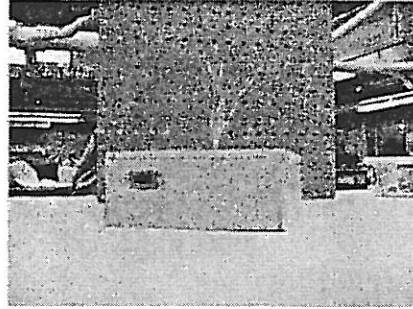


Fig. 3

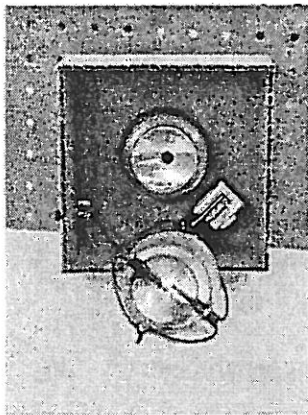


Fig. 4

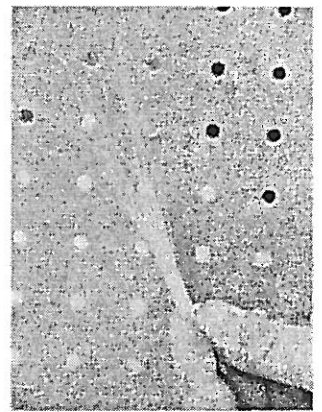


Fig. 5

Name _____
Hour _____

LIGHT BOX EVALUATION

- _____ 1. Layout accurate (measurements).
 - _____ 2. Holes drilled/punched accurately.
 - _____ 3. 90° corners on box.
 - _____ 4. Wired correctly (parallel circuit).
 - _____ 5. Switch works properly.
 - _____ 6. Fiber optics mounted securely.
 - _____ 7. Fiber optics work properly.
 - _____ 8. Nicely painted and finished.
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Letter or % grade for this project _____

Key: √ = Good
 ~ = So-So
 0 = Not so hot

Light Box

