

Student Worksheet for Burglar Alarms

Overview: Burglar alarms not only protect your stuff, they put the intruder into a panic while they attempt to disarm the triggered noisemaker. This experiment teaches students how to make simple burglar alarms, which are really clever switches, out of their basic circuit equipment.

What to Learn: This particular burglar alarm is an NC (Normally Closed) switch, and kids will learn how to wire it up in a circuit and pull the trigger.



Lab Time: To arm the trip wire, insert a small scrap of paper between the jaws, and connect the other end of the paper to a thin piece of thread or fishing line that is spread across a doorway about an inch from the floor. When someone trips on the thread, the paper gets yanked out, the jaws touch and... *GOTCHA!!!*

Materials:

- AA battery case (Radio Shack #270-408)
- LED (Radio Shack #276-012)
- 3 alligator clip wires (Radio Shack #278-1157)
- 2 AA batteries (cheap, "dollar store" type work great)
- wood clothespin
- aluminum foil
- scrap of paper

Experiment:

1. Make the NC trip wire switch:
 - a. Open the clothespin all the way, and cover each jaw securely with foil.
 - b. Open up your paperclip and grab a scrap of a sheet of paper. When you release the clothespin, the metal jaws should be on either side of the paper.
2. Make the Trip Wire Circuit:
 - a. Use your batteries, wires, and LED to make the LED light up. (No clothespin yet.)
 - b. Remove one of the alligator wires from the LED and replace it with a third alligator wire.
 - c. Attach one of the free alligator wire ends to the foil on one of the jaws of the clothespin.
 - d. Attach the remaining alligator wire to the other foil jaw.
 - e. Yank the paper away – did the LED light up? (It should!)
 - f. Attach string to the paper. The length of string you need is going to depend on where you install the trip wire alarm. Installation Tip: Hide this switch down low by the door frame and use fishing line instead of string to make this burglar alarm virtually invisible. Use a tack in the frame or tie the line to the door hinge to secure and wait for the action...

Exercises : Answer the questions below:

1. How does this work?
2. What type of switch is the trip wire?
3. Name three places you can install this alarm.