MAKING WAVES
with radio

ACTIVITY GUIDE
Make a Paper Sensor Switch

Overview

Sensors can be made from using different craft materials to sense if something is being touched or pressed like keys on a keyboard. A sensor can take an input to start or stop the flow of electricity to devices. Make a pressure sensor to help learners make sense of coding with a micro:bit by connecting physical actions with digital outcomes. Building their own sensor switch introduces them to basic electrical circuits and reinforces how inputs, such as pressing the switch, lead to outputs in their code. This guide shows a simple design to make a switch using metal foil and paper.

Learning Objectives

1. Switches and sensors can be found in everyday devices that use electrical power.
2. Switches turn on and off the flow of electrons in a circuit based on sensor input.
3. A switch can be made to control the inputs on a BBC micro:bit.

Materials

- Cardstock or index cards
- Aluminum foil
- 2 wires with alligator clips on each end
- Glue stick
- Scissors

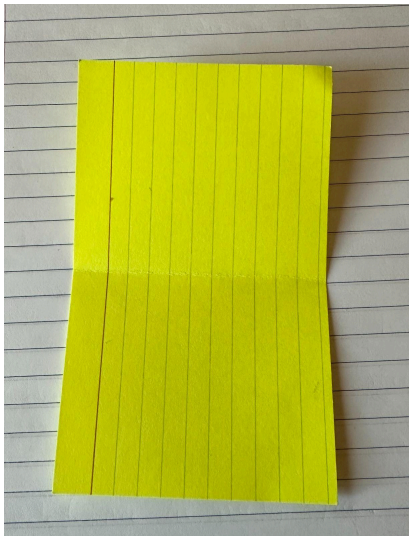
Safety

- Ensure learners are using age-appropriate scissors and supervise their use.
- Ensure that learners understand not to connect the micro:bit or wires to high-voltage sources or other electrical devices.

Directions

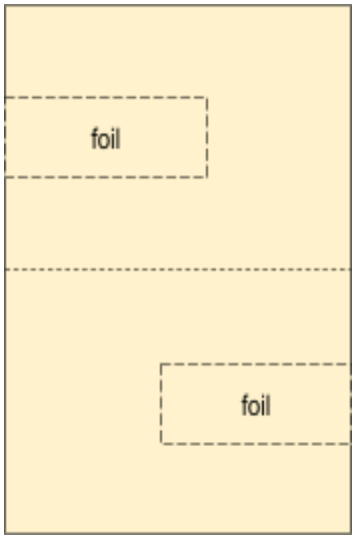
Card switch

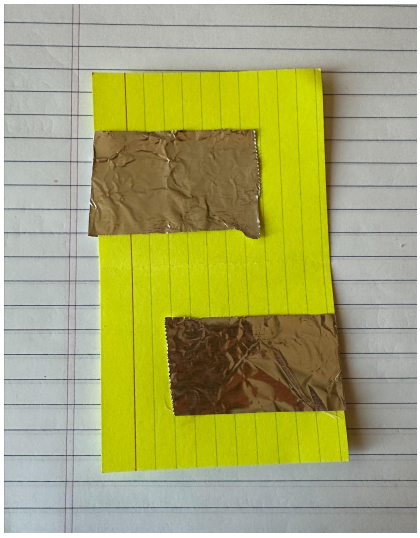
1. Cut a piece of cardstock into 3” x 5” or use an index card and fold it in half. Then unfold and make it flat.



2. Use scissors to cut two small pieces of foil about 1.5” to 2” each.

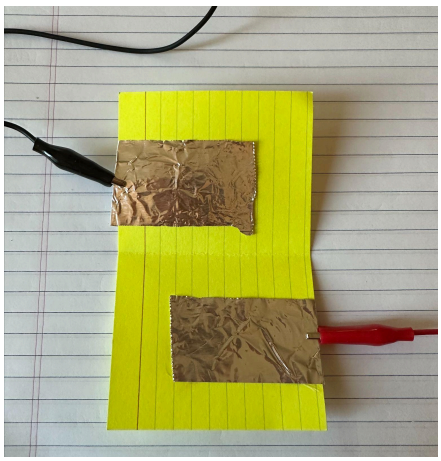
3. Using a glue stick, attach each foil piece to the areas indicated. The foil can fold over to the other side if too long.

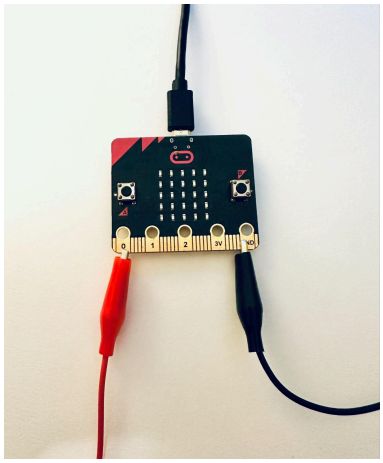




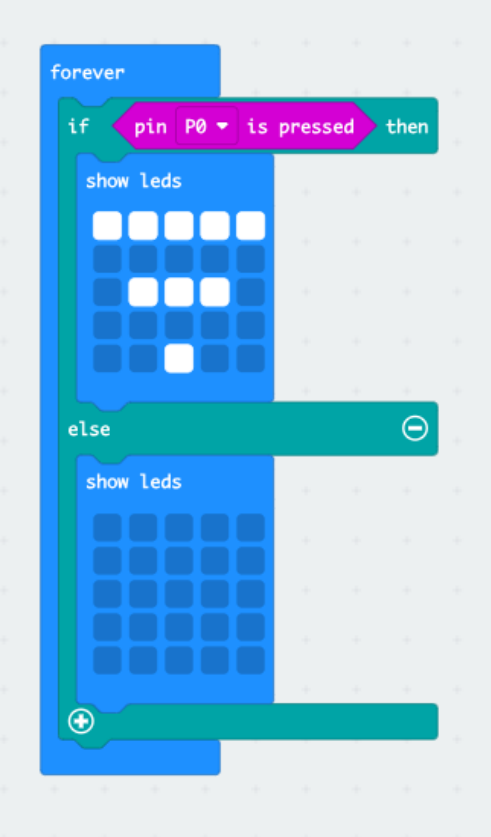
4. Attach an alligator to each of the foiled areas. You have a switch! When the two foil pieces come into contact, they allow electrons to flow to complete an electrical circuit.

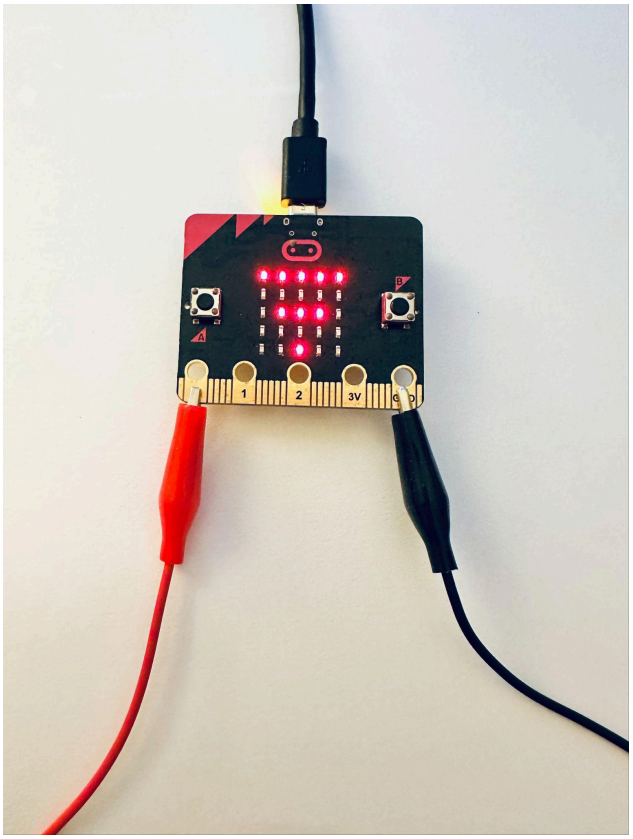
5. Test the switch by connecting the other ends of the alligator clips to your device. Here we use a BBC micro:bit to test our switch by connecting clips to GND and P0.



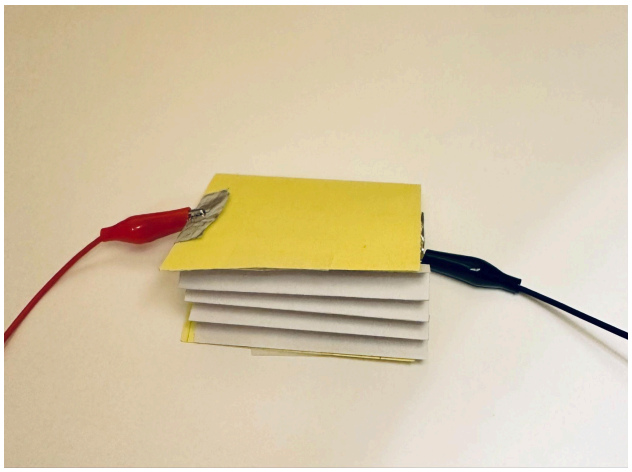


6. Use this sample MakeCode to show a WiFi symbol when the switch is closed. When the switch is open, nothing is shown.





7. To make a fancier switch, fan fold a 3” x 3” piece of paper and tape each end to the opening of your paper switch. This makes the switch easier to stay open and acts as a spring.



Content Background

All technologies—including radio technologies and microelectronics—use sensors and switches to control the flow of electrons in electrical circuits. Switches serve as essential components that enable devices to turn on and off, process signals, or respond to user inputs. In the context of micro:bits, switches act as external inputs that trigger specific actions in the code. By completing or interrupting an electrical circuit, sensing switches allow the micro:bit to detect whether they are open or closed. This principle forms the foundation for more complex digital systems, where switches control inputs such as buttons, sensors, or touch-sensitive interfaces. When connected to the micro:bit’s input pins, a switch allows the micro:bit to read changes in voltage, registering a high input when the switch is closed and low input when open. This DIY switch provides a tangible way to understand how hardware and software interact in modern technology.

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