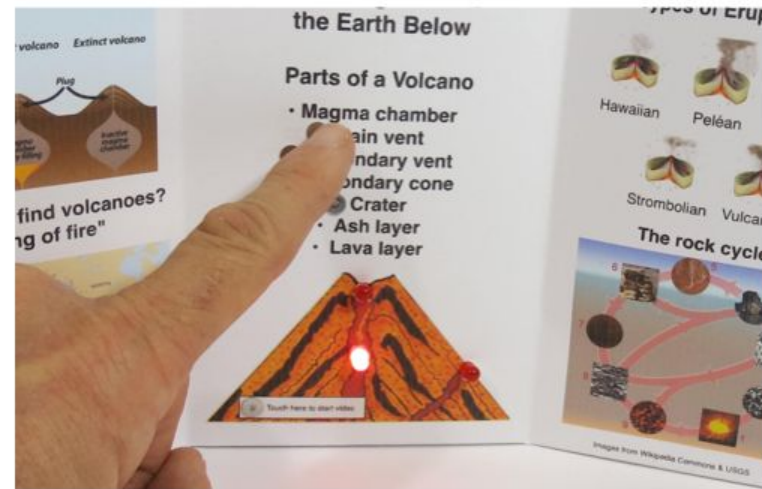


# Activity 1: Touch & LED Interactivity with the volcano posterboard (15 minutes)

**Note: This activity assumes you already have the MakerBit program installed on the micro:bit.**

**If you are using a micro:bit from another source than the MakerBit kit, or have previously re-programmed the micro:bit, go to the last page (or slide) of these instructions to install the MakerBit program on the micro:bit.**



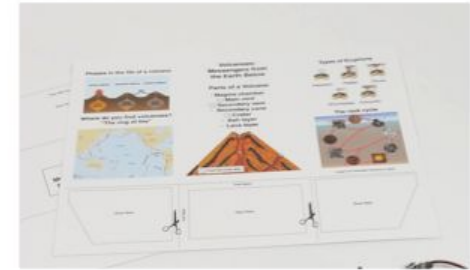
## Locate the following in the MakerBit kit...



**Rainbow cables, one with a grey block connector for touchpoints and the other with a black block connector and 6 red LEDs**



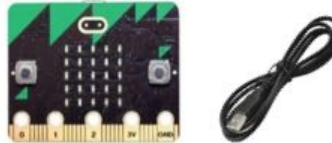
**Five touchpoints & backs (earring posts & clasps)**



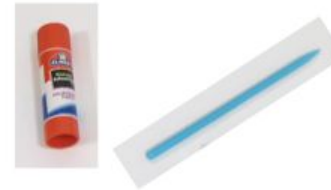
**flat cardstock for mini volcano project**



**MakerBit & 9v battery**



**BBC micro:bit microcontroller & micro-USB cable**



**Glue stick, blue hole-making tool**

**plus..**



**scissors (not included in the MakerBit kit)**

# Make a Model

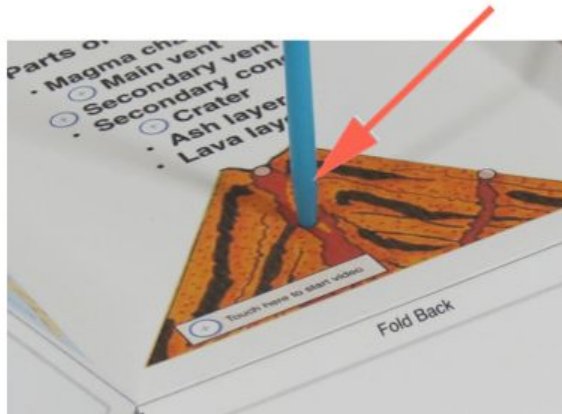
- 1 Use scissors to cut along the **dotted** lines as you see here.



- 2 Fold into thirds and fold the tabs **back**.



- 3 Push the blue stick **completely into** the paper to make **3 holes** for the LEDs in the orange part of the volcano diagram where you see **the small circles**. Push from the **front** and use a doubled-over piece of paper as a backstop to protect your fingers from getting poked when the point goes through the card of the volcano.

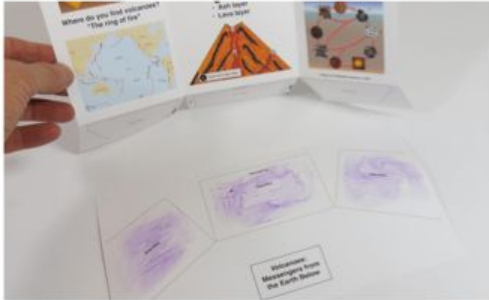


- 4 Locate the touchpoints and push them from the **FRONT** of the board through the **marked "+" positions**. Use a **silicone earring back** as a "backstop" to protect your fingers behind the paper. Secure on the back using the earring backs.

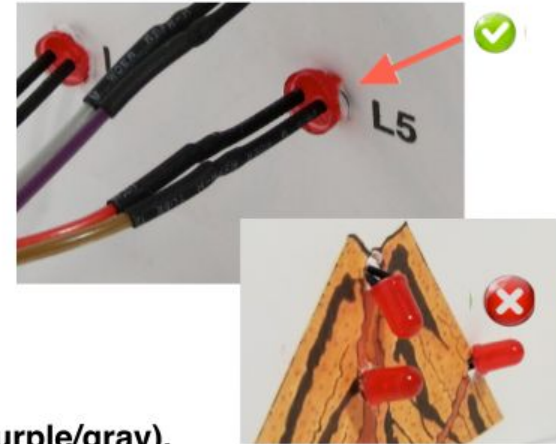


# Connect the LEDs and Touchpoints

- 1 Using the glue stick to apply glue to the 3 areas on the base, and attach the panels so that the base of each panel just covers the black line that indicates where it should be positioned.



- 2 Push the LEDs **into, but not all the way through**, the holes from the **BACK** of the board. Connect the LED with the **red/brown** wires to L5



- 3 Continue with the LEDs for L6 (black/white wires) and L7 (purple/gray). You can pull apart the wires as necessary.

- 4 For the touch sensors, use the rainbow cable with the gray block connector, and push the sockets onto each of the posts of the 5 touchpoints, starting with the **red** wire on the **outside** edge of the cable. **The posts only go about half-way into the sockets.**

## Connect:

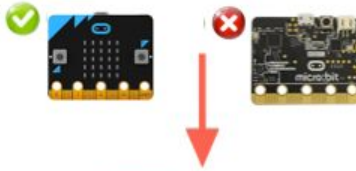
the **RED** wire to T5,  
the **BROWN** wire T6,  
the **BLACK** wire to T7,  
the **WHITE** wire to T8,  
the **GREY** wire to T9.



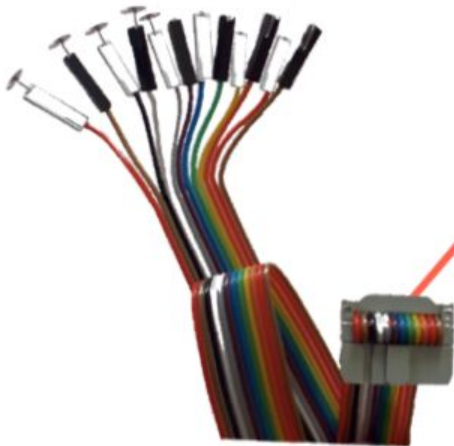


# Connect Cables to the MakerBit

- 1 If it's not already connected, plug the microbit into the connector at the top of the MakerBit **with the LED matrix facing you.**



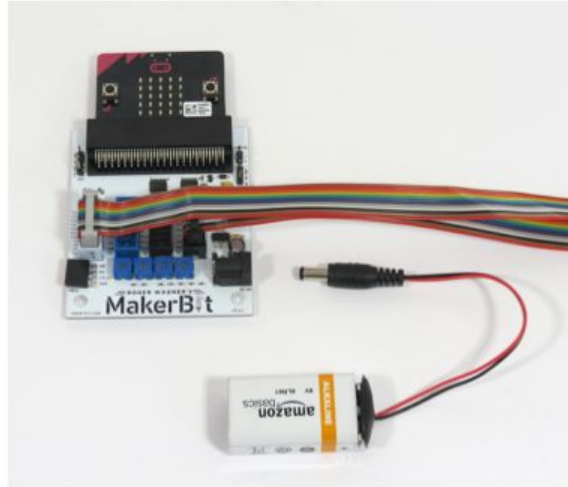
- 2 Plug the black block of the LED cable into the TOP black box on MakerBit board.



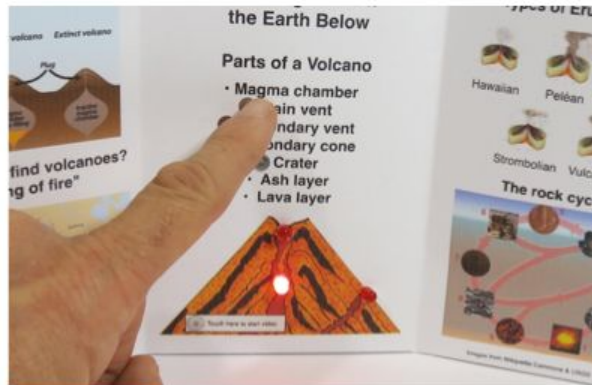
- 3 Plug grey block into white box on MakerBit board

# Try It Out!

- 1 Connect the 9v battery. The 3 LEDs on your model will blink for a few seconds while the MakerBit starts up. **Wait for the blinking to stop (about 5 seconds)**



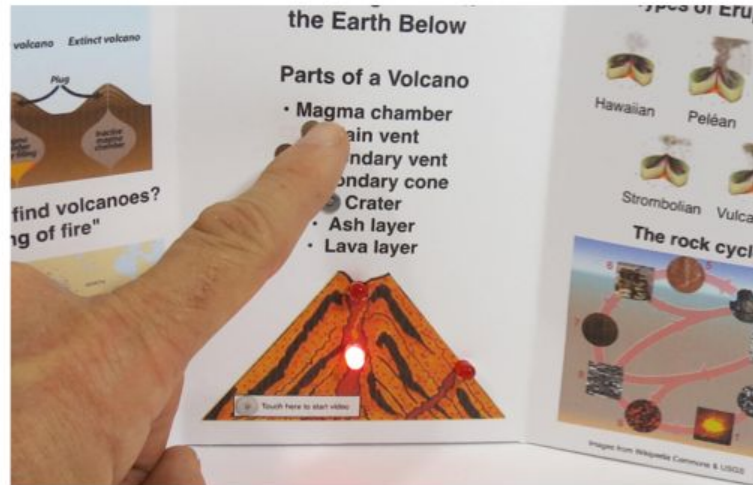
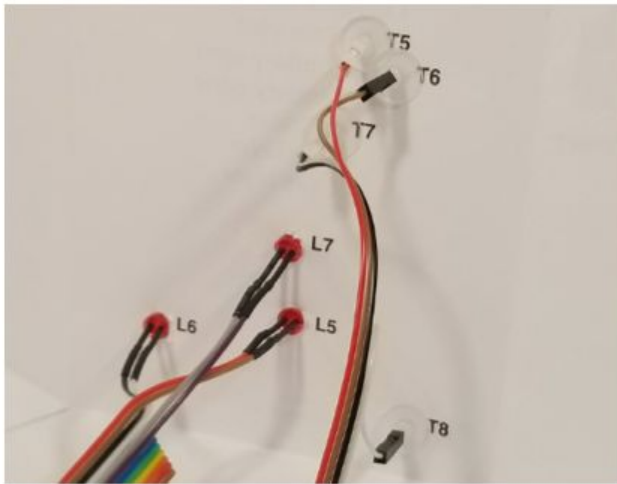
Now, when you touch the "Main vent", "Secondary vent" and "Crater" sensors, the LEDs will light up.



# How Did All That Work?

The micro:bit is like a small computer, and the MakerBit program that you installed on it just continuously watches the touchpoints. Each touchpoint has a number (5-16), and each LED has the same range of numbers (5-16).

When a touchpoint is touched, the MakerBit program lights up the same number LED as the touchpoint that is being touched.



The 4th touch sensor, "Touch here to start video" is used to initiate a YouTube or Google drive video. To see how that works, continue to Part 2 of this tutorial! (The 5th sensor, T9, will be used for a Google Earth view of Mount Vesuvius.)

# Installing the MakerBit Program on the micro:bit

To install the MakerBit program on to the micro:bit, connect the micro:bit to your computer with a microUSB cable. Open the MakerBit Media Linker app, go to the **Programs** menu, and choose **MakerBit Program**.



This will download the makerbit.hex file to the Downloads folder of your computer. Locate the file in your Downloads folder, and drag it on to the micro:bit drive icon on your computer.

That's it! This does not usually need to be repeated in the future, and you're now ready for all the MakerBit activities that use the Media Linker, or the self-running mode without a computer!

If you do not already have the Media Linker on your computer, use this link: <http://bit.ly/2lmYGIO> for instructions on how to install the Media Linker.