



# Electric Play Dough Project 1: Make Your Play Dough Light Up & Buzz!

## Experimental Procedure

This project follows the  [Scientific Method](#). Review the steps before you begin.

1. Optional: if you are making your own homemade conductive and insulating dough in addition to using the dough in the kit, follow the instructions on [Electric Play Dough Recipes](#).
2. Insert the four AA batteries into the battery pack that came with your kit. Make sure the "+" signs on the batteries line up with the "+" signs inside the battery pack. Ask an adult if you need help making sure they are in the correct way.
3. Make two lumps of Play-Doh (or homemade conductive dough) and one lump of modeling clay (or homemade insulating dough). Stick them together, with the modeling clay in the middle; make sure the two lumps of Play-Doh are not touching each other.
4. Stick each metal rod from the battery pack (there should be one attached to a black wire, and one attached to a red wire) into its own lump of Play-Doh.
5. Pick an LED from your kit. The two pieces of metal sticking off the LED are called "leads" (pronounced "leeds"). Insert one lead into each lump of Play-Doh. **Important:** Electricity can only flow through LEDs in one direction. The LED has one lead that is slightly longer than the other one; this is the **positive** lead, and it should be inserted into the lump of Play-Doh with the *red* wire. The shorter lead should be inserted into the lump of Play-Doh with the *black* wire.
6. Use the built-in switch to turn on your battery pack. Your LED should light up! If it does not, do not worry; you probably just plugged your LED in backwards. Flip your LED around and try again (if it still does not light up, open your battery pack and make sure you inserted each battery facing the correct direction, paying attention to the "+" symbols). If you are still having trouble, read the [FAQ](#) section for help.
7. Congratulations! You have made your first play dough circuit. It should look similar to the one in Figure 5.



Image Credit: [Ben Finio, Science Buddies / Science Buddies](#)

**Figure 5.** Your first play dough circuit should look like this.

7. Now it is time to get creative! The *shape* of the Play-Doh lumps does not matter when connecting the LEDs, as long as there is a **closed circuit** for electricity to flow. Figure 6 shows two Play-Doh "people" holding hands with an LED; can you come up with your own fun designs for your own circuits?



Image Credit: [Ben Finio, Science Buddies / Science Buddies](#)

**Figure 6.** The *shape* of the Play-Doh pieces does not matter when connecting LEDs; as long as there is a closed circuit for electricity to flow (and no short circuit), the LED will still light up.

8. Return the dough to its plastic containers so it does not dry out. Store homemade dough in airtight plastic bags or containers. The [FAQ](#) section has more information about how long homemade dough will last in storage.

## Frequently Asked Questions (FAQ)

If you are having trouble with this project, please read the FAQ below. You may find the answer to your question.

This guide contains answers to some frequently asked questions for the "Squishy Circuits" project idea series:

1. [Electric Play Dough Project 1: Make Your Play Dough Light Up & Buzz!](#)
2. [Electric Play Dough Project 2: Rig Your Creations With Lots of Lights!](#)
3. [Electric Play Dough Project 3: Light Up Your Sculptures!](#)

Q: My homemade dough is too sticky or too dry.

A: If your homemade dough is too wet and sticky, you can slowly knead in extra flour to dry it out. If your dough is too dry and crumbly, you can slowly knead in extra water.

If you are making a new batch of dough, the best way to prevent these problems is to follow the directions carefully and measure the appropriate amount of each ingredient. Some steps require you to slowly add small amounts of water until the desired consistency is formed, instead of adding the entire amount all at once.

Q: I'm not sure if my Squishy Circuits Kit is working.

A:

1. Make sure you properly inserted the batteries into the battery pack. Each battery is marked with a "+" symbol on one end. Make sure these symbols line up with the "+" symbols on the inside of the battery pack.
2. Make sure you turn the switch on your battery pack to the "on" position when you are testing your circuit.
3. Make sure your conductive dough is tightly secured around the metal leads for your battery pack. If you wiggle them around a lot and they come loose, then they will not be in good contact, and it will be difficult for electricity to flow.
4. If you have a multimeter, you can use it to measure the voltage from your battery pack. Four AA batteries should provide about 6 volts (V). If the voltage is lower than 6 V, your batteries might be dead. Consult the Science Buddies [Multimeter Tutorial](#) if you need help using a multimeter.

Q: My LEDs won't light up.

A:

1. Remember that LEDs have a *polarity*, meaning they only work in one direction. The *longer* LED lead should be connected toward the *positive* side of your circuit, which is the side with the red wire protruding from the battery pack. If one LED in your circuit is not lighting up, but others are, you probably just have that LED plugged in backwards. Try reversing its direction and see if it lights up.
2. Make sure your conductive dough is tightly packed around the metal leads for your battery pack. If you wiggle them around a lot and they come loose, then they will not be in good contact, and it will be difficult for electricity to flow.
3. Make sure you do not have a short circuit. For more information about short circuits (including pictures and diagrams), refer to the [Introduction](#) of the first Squishy Circuits project.
4. If your circuit has two or more LEDs, make sure they are wired in *parallel* and not in series. Wiring multiple LEDs in series will quickly cause them to become very dim. For more information about the difference between series and parallel circuits (including pictures and diagrams), refer to the [Introduction](#) of the second Squishy Circuits project.
5. Make sure you are not using very long pieces of conductive play dough to connect your battery terminals to your LEDs. The conductive play dough has a fairly high *resistance*, which causes the voltage to drop as electricity travels through it. If you use very long pieces of conductive dough, the voltage might drop so much that the LEDs will not light up. To learn more about voltage and resistance, check out the Science Buddies [Electronics Primer Introduction](#).
6. Never connect your LEDs directly to the battery pack leads without using conductive dough in between. Connecting LEDs directly to the battery pack will cause them to *burn out*; too much current will flow, permanently destroying the LED. If you have LEDs that do not light up at all despite trying all the steps above, you might have accidentally burned them out at some point.

Q: Some parts of my circuit work and some don't.

A:

1. In general, follow the same steps as in FAQ 3. For a big circuit, it is possible to have a short circuit in only *part* of the circuit; some LEDs might light up, while others stay dark. You might have also accidentally wired some LEDs in series, and some in parallel. Remember to always avoid short circuits, check the direction your LEDs are plugged in, and make sure your LEDs are wired in parallel.
2. You can test individual parts of your circuit, one at a time. You can do this by breaking them away from the rest of your circuit and connecting them to the battery pack separately, or by sticking the battery pack leads into different parts of your circuit. This will let you identify problem areas in your circuit.
3. Remember that it is possible to burn out LEDs by connecting them directly to the battery pack. If nothing else works, try swapping in a new LED.

Q: How should I store my homemade dough? How long will it last?

A:

1. Both types of homemade dough (conductive and insulating) should be stored in air-tight plastic containers or plastic bags. You can put it in the refrigerator to make it last even longer.
2. The conductive play dough contains salt, so will last for several weeks or months if kept in an air-tight container. Eventually, you may still see spots of mold or bacteria growing on it.
3. Insulating play dough contains sugar, which bacteria and other microorganisms thrive on. You may start to see mold or bacteria growing on it after several days or a week, but it will last longer if refrigerated.
4. If your play dough develops spots of visible mold or bacteria, you should throw it away and make a new batch.

Q: I can get the LEDs to work, but not the buzzer.

A:

1. Make sure you use short, thick lumps of Play-Doh to connect the buzzer to your battery pack. The buzzer requires much more electricity to operate than the LEDs. Long, thin strips of Play-Doh have a higher electrical *resistance*, making it difficult for enough electricity to flow through them.
2. The buzzers have polarity, just like the LEDs. Their red wires need to be connected to the battery pack's red wire, and their black wires connected to the battery pack's black wire.

Last edit date: 2023-11-18

---

You can find this page online at: [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Elec\\_p073/electricity-electronics/squishy-circuits-project-1?mode=procedure](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Elec_p073/electricity-electronics/squishy-circuits-project-1?mode=procedure)

You may print and distribute up to 200 copies of this document annually, at no charge, for personal and classroom educational use. When printing this document, you may NOT modify it in any way. For any other use, please contact Science Buddies.

Science Buddies is a 501(c)3 nonprofit organization.  
Copyright © 2002-2025 Science Buddies. All rights reserved. Reproduction of material from this website without written permission is strictly prohibited.  
Use of this site constitutes acceptance of our [Terms and Conditions of Fair Use](#).  
[Privacy Policy](#)