

MAKER SKILLS LIBRARY

Maker Skill: Wire Stripping & Heat Shrink

This example demonstrates how to strip wires and use heat shrink to build a long lasting electric circuit. Heat shrink can be used as a

1. Stripping wires allows us to expose the conductive metal core that carries electricity through the circuit.
- 2.
3. We use heat shrink sleeves to cover our wire connections and make them more secure. Heat shrink is not conductive, so electricity can't escape through it.
- 4.
5. Demonstrate how the wire strippers work. Strip both ends of a piece of stranded wire and twist the stripped ends together. Explain that we need to make sure the conductive (metal) parts of the wire are touching, and then we cover it up with the heat shrink to protect the connection that we have just made. Demonstrate how to use the heat gun and remind them not to point it directly at their fingers or at each other.
6. Students will use wire strippers to remove about ½ inch of the plastic covering from each end of their wires. Afterwards, they can heat shrink their wires together to form a bracelet.

Demo wire stripping:

- ❖
- ❖ Highlight the ridges that are on the scissor part, telling students that the different sizes of the ridges coordinate with the sizes of the wires we use. (When you squeeze on the handle and close the scissor, the two ridges on each size come together to form a circle/hole (the width of the circle = the size of the wire)).
- ❖ Take a piece of wire and insert it into the ridge that best fits it (the first ridge or 0.2). Then squeeze down and pull the stripper away from you, away from the wire.

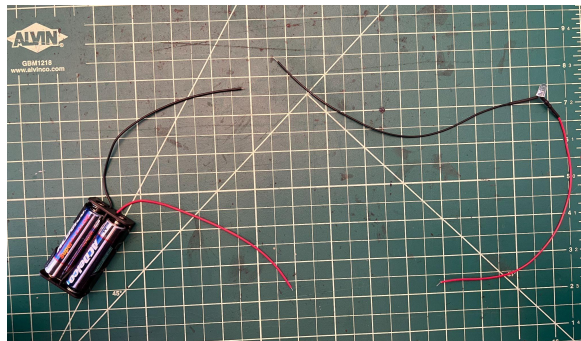
NOTE: If it does not work, try again. If students have stripped the wires but it is not completely stripped, they can pull the plastic covering off with their hands as it's not connected to anything else.

7. They will then turn their attention to the educators who will then demo how to heat shrink wires together using the following steps:
8. Insert a heat shrink plastic tubing onto one of the wires. In this instance, highlight the red wire from the battery pack.
9. Take the exposed end of the red wire for the vibration motor and twist it together with the exposed end of the red wire from the battery pack.
10. Bring the heat shrink plastic tubing over the twisted exposed ends of the red wires and apply heat using the heat gun to create a permanent hold on the wires.
11. Repeat on the black wires.

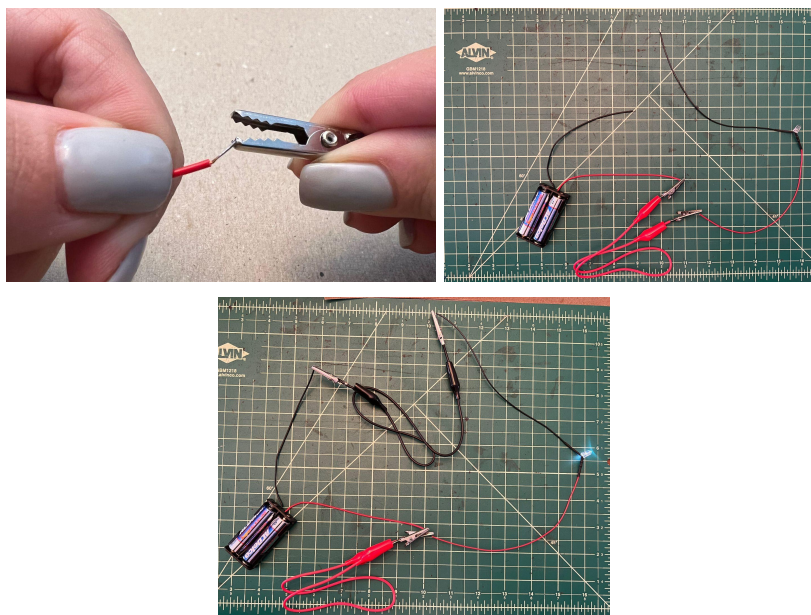
12. Insert the batteries into the battery case. Ensure the batteries are inserted in the correct direction. For AA and AAA batteries, the flat side of the batteries (negative) should be touching the springs of the battery case.



13. Align the negative wire of the battery case with the negative wire of the LED. In most cases, the negative wires on both the battery case and the LED will be black.
14. Align the positive wire of the battery case with the positive wire of the LED. In most cases, the positive wire on the battery case will be red. The positive wire on the LED may be red or another color, which usually indicates the color of the LED bulb.



15. Use an alligator clip to connect the negative wire of the battery case to the negative wire of the LED. Ensure the metal clip is connected to the metal part of the wire. Do the same with another alligator clip to connect the positive wire of the battery case to the positive wire of the LED.



16. Troubleshoot the connection. If your LED is not turning on, try the following tips:

- Change the battery connection so that the positive/negative sides are connected to the opposite sides of the LED.
- Ensure all connections are metal-to-metal so that electricity can flow.
- Make sure you haven't created a short circuit! If the positive and negative connections accidentally touch, this will create a short circuit and prevent the electrical energy from moving through the LED. If a short circuit stays connected, the batteries can become quite hot. Spread out your circuit parts as shown above so that you can trace the pathway of electricity and prevent short circuits.

Note: Alligator clips can be difficult to open, especially for younger makers. To help, try removing the plastic covers on the clips by sliding them down off the clips or cutting them off entirely. It may also help to push the alligator clip open against the work surface instead of pinching it between your fingers.

