

# LED Snowman



## Grade 7 ADST Project



**Comox Valley Schools**

A Community of Learners  
INNOVATIVE • INQUISITIVE • INCLUSIVE

# Snowman Copper Tape Circuits & Soldering (Teacher Information)

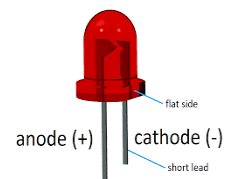
## SUPPLIES YOU WILL NEED

- Wooden laser cut snowman
- 3 Leds (red, green, yellow of your choice)
- Resistor
- CR2032 Coin battery
- Coin battery holder
- 10cm of copper tape
- Switch
- 10cm Wire
- Scissors
- Hot Glue gun (to hold LEDs & Battery)
- Soldering Kit – provided by SD71 Careers



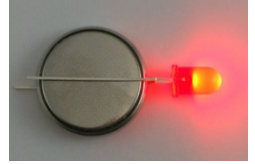
## BEFORE STARTING

- 1) Have the snowman ALREADY painted on the front so LEDs don't get painted accidentally.
- 2) LEDs have a positive and negative (see diagram). Make sure they are in the correct way around or they will NOT light up!! Each LED has a different brightness. Red are the brightest.
- 3) NEVER have the positive and negative of the battery both touch the copper tape directly at the same time. This is called a short circuit and will kill the battery.

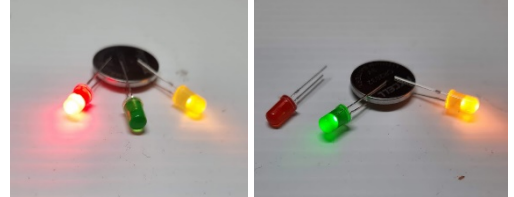


## TROUBLESHOOTING THE CIRCUIT (Lots can actually go wrong here...)

- 1) Is the copper tape connected to all the LEDs? Are they actually soldered?
- 2) Is the battery Dead? Place a spare LED directly across the Battery (Long Leg to positive “+” side of battery), does it illuminate?
- 3) Is there a place in your circuit that the copper tape from the negative side of the battery is connecting to the positive side? This is a short circuit which is BAD!!!



- 4) Are all the solders actually good? Inspect each one or use a multimeter
- 5) Are the LEDs in Backwards or the legs touching each other? Are the LEDs able to work together? Some LEDs will not work with each other

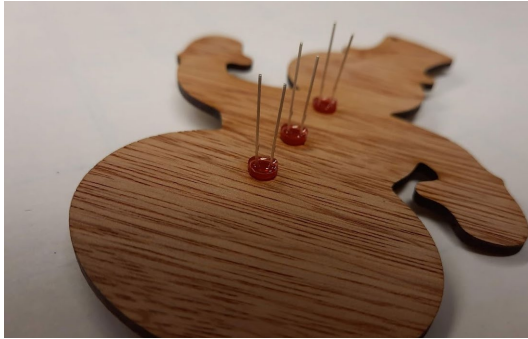


- 6) To watch videos on how to demonstrate; how to strip wire, how to solder different parts of the project AND troubleshoot these types of circuits, use the QR code below or visit the careers website

[comoxvalleyschools.ca/career-programs/jr-adst-electronics-3d-printing/](https://comoxvalleyschools.ca/career-programs/jr-adst-electronics-3d-printing/)



# LED SNOWMAN STUDENT INSTRUCTIONS



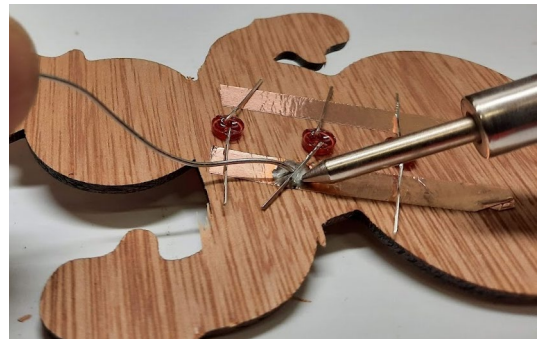
- 1) Insert 3 LEDs into the holes. You may want to use a SMALL amount of hot glue to keep them in place depending on how tight the fit.



- 2) Cut TWO 5cm pieces of tape. Carefully peel away a SMALL amount of the copper tape.



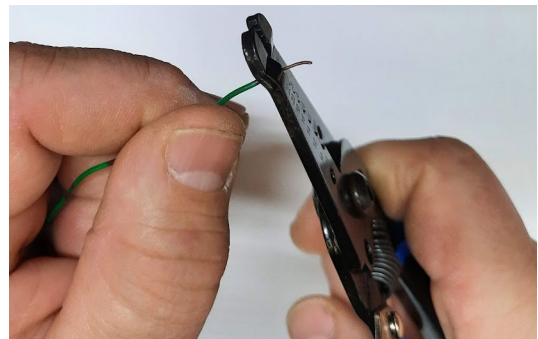
- 3) Place the copper tape as shown. Bend the SHORT legs (negative) down towards the hand that is lower and the LONG Legs (positive) towards the hand that is raised as shown. Do NOT cross the legs of the LEDs!!



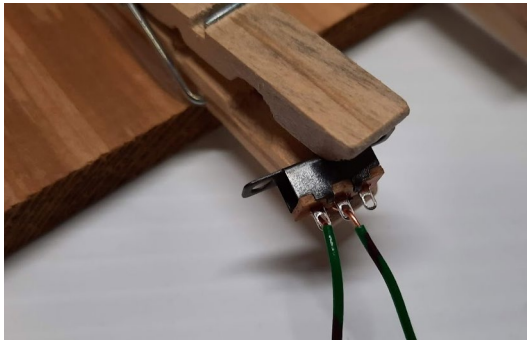
- 4) Solder the LED Legs to the copper Tape. Touch the solder pencil to the LED leg and copper tape at the same time, count to 2, then apply the solder as shown.



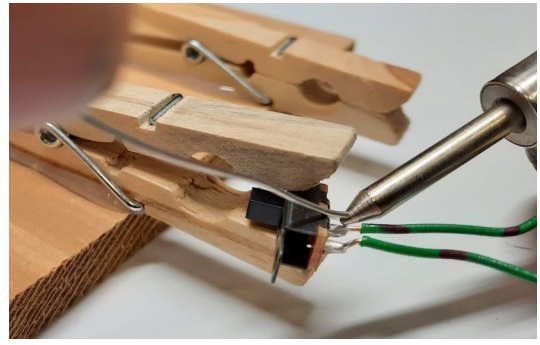
- 5) When all LEDs are soldered, it should look like the picture shown



- 6) Strip BOTH ends of 2 wires that are approx. 5cm long.



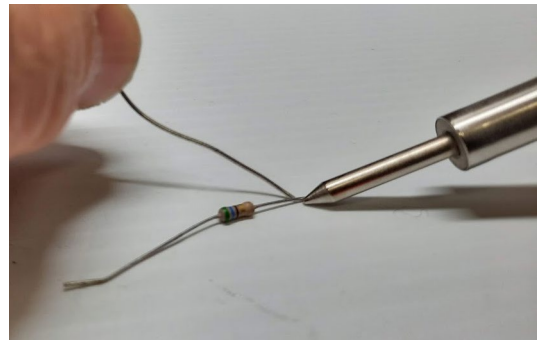
7) Insert the 2 wires into the legs of the switch as shown.



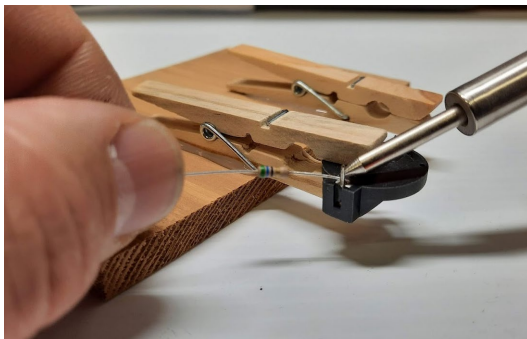
8) Solder both switch wires as shown



9) "Tin" the legs of the Coin Battery holder as shown. This allows other parts (resistor and switch wire) to solder to it much easier.



10) "Tin" one end the resistor and the switch wires (not shown)



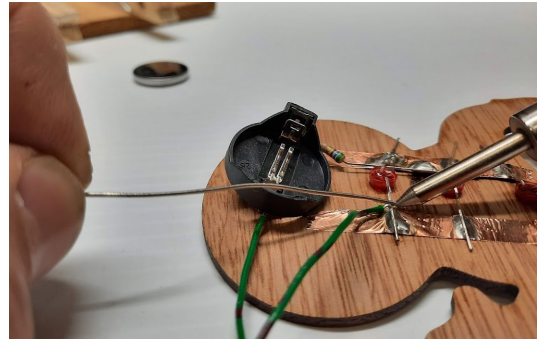
11) LOOK AT THE PICTURE CAREFULLY!! Attach the resistor to the Coin Battery holder AS SHOWN!! The resistor attaches to the positive side of the Coin Battery holder!



12) Attach the switch to the NEGATIVE side of the Coin Battery holder as shown.



13) Test to see if the LEDs light up. If they do not, start troubleshooting (LEDS backwards, copper tape not connected, short circuit, etc)



14) Test to see if the LEDs light up. If they do not, start troubleshooting (LEDS backwards, copper tape not connected, short circuit, etc)



15) Test the circuit to make sure it works! If not, start the troubleshooting ideas below.



16) If the circuit works. Hide the wires and Coin Battery holder behind the project as shown and apply a small amount of hot glue to Hold the Coin Battery holder and switch in place 😊.

## TROUBLESHOOTING THE CIRCUIT (Lots can actually go wrong here...)

- 1) Is the copper tape connected to all the LEDs? Are they actually soldered?
- 2) Is the battery dead? Place a spare LED directly across the Battery (Long Leg to positive "+", side of battery), does it illuminate?
- 3) Is there a place in your circuit that the copper tape from the negative side of the battery is connecting to the positive side? This is a short circuit which is BAD!!!
- 4) Are all the solders actually good? Inspect each one or use a multimeter (have your teacher show you)
- 5) Are the LEDs in backwards or the legs touching each other? Are the LEDs able to work together? Some LEDs will not work with each other

