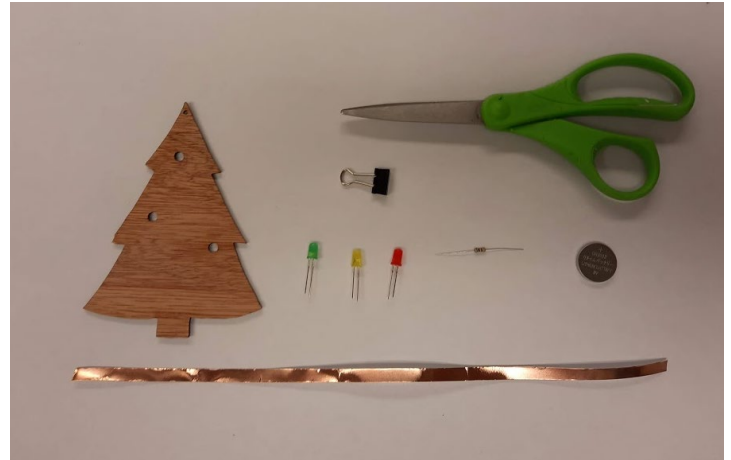# LED Christmas Tree

ADST Project

Copper Tape Circuits
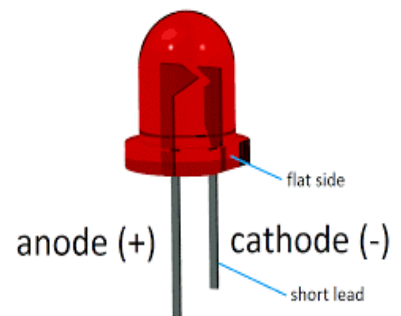# (Xmas Tree)

SUPPLIES YOU WILL NEED

- Wooden Laser Cut Tree
- 3 Leds (red, green, yellow of your choice)
- Resistor
- CR2032 Coin battery
- 30cm (40cm) of copper tape
- Binder Clip (as a switch)
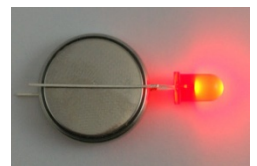- Scissors

**Optional – Hot Glue gun (to hold LEDs & Battery)

BEFORE STARTING

1) Have the Christmas Tree ALREADY painted on the front so LEDs don't get painted accidently.

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 touch through the copper tape. This is called a short circuit and will kill the battery.
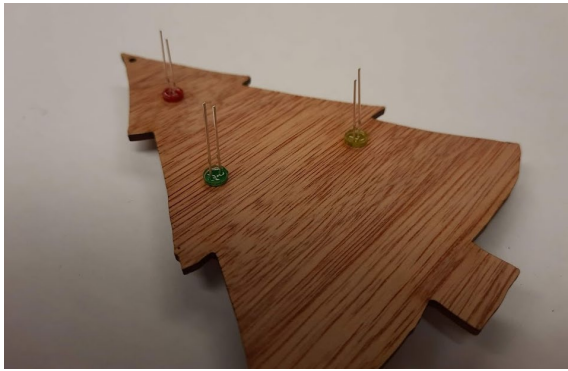
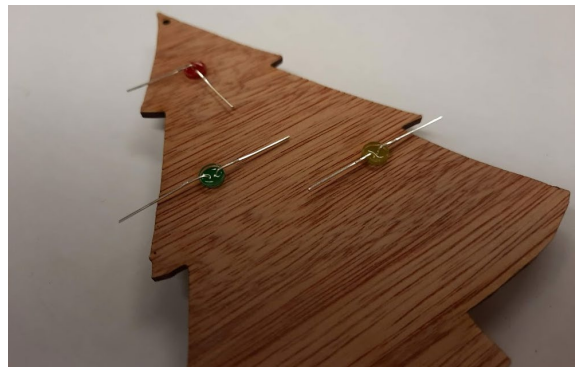## TROUBLESHOOTING THE CIRCUIT (Lots can actually go wrong here…)

1) Is the copper tape connected to all the LEDs? Press down on the copper tape where it connects to the LEDs or even bend the legs over the copper tape and use the remaining tape to go over them again.

2) Is the battery Dead? With the "Binder Clip/Switch" NOT connected to the battery, 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) Is the Binder Clip making contact with the copper tape & Battery?

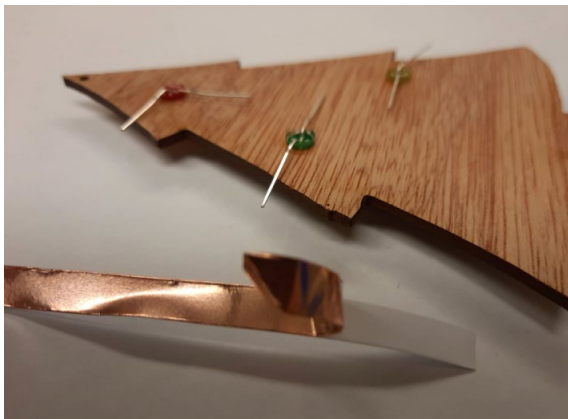5) Are the LEDS in Backwards or the legs touching each other?
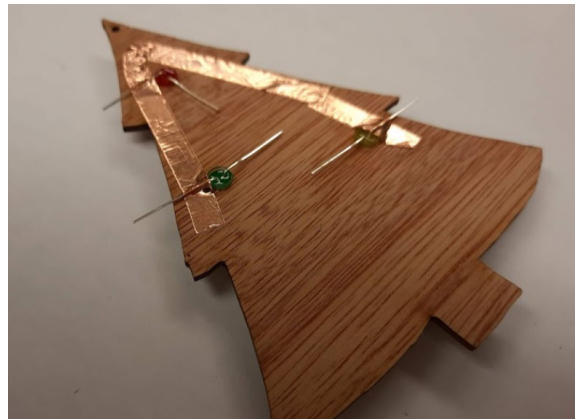
LED XMAS TREE INSTRUCTIONS

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) Bend the SHORT legs (negative) down towards the center and the LONG Legs (positive) towards the outside as shown. Do NOT cross the legs!!
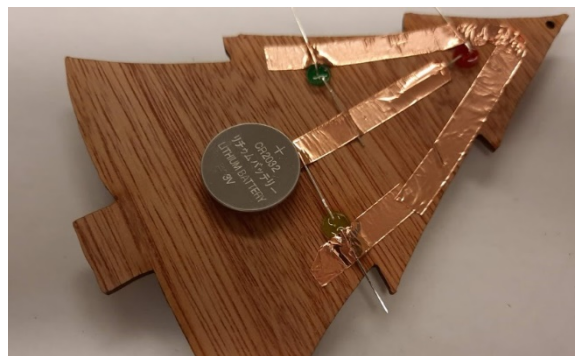
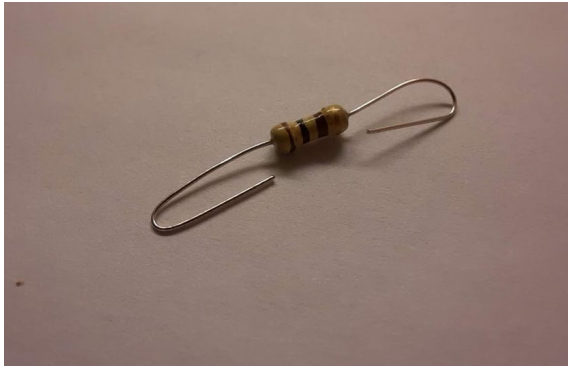3) Cut 15cm of tape. Carefully peel away a SMALL amount of the copper tape.

4) CAREFULLY place the copper tape over the POSITIVE LEGS (longer leg) of the LEDs as shown. BE CAREFUL handling the tape!
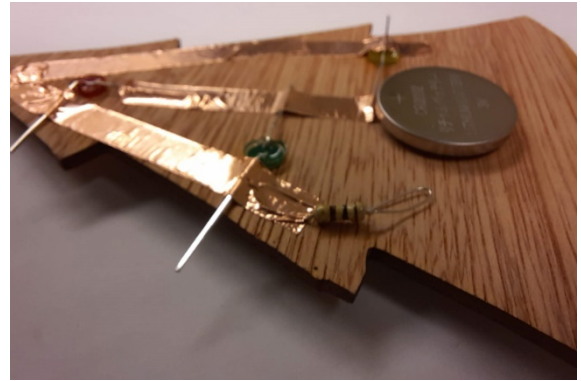
5) Cut approximately 7.5cm of copper tape and then CAREFULLY tape the NEGATIVE LEGS of the LEDs. Make a "Loop" with the tape as show. The battery will STICK to this loop.

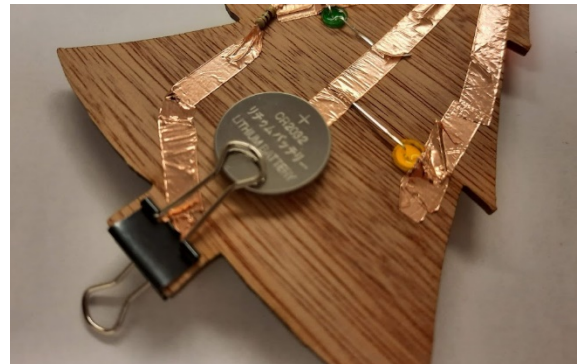6) Stick the Coin Battery in place. The "Positive" side (has text and "+" symbol) facing up.

Comox Valley Schools
A Community of Learners
INNOVATIVE • INQUISITIVE • INCLUSIVE

7) Get a resistor and bend it as follows. A resistor slows electricity down in a circuit and control the brightness of the LEDs
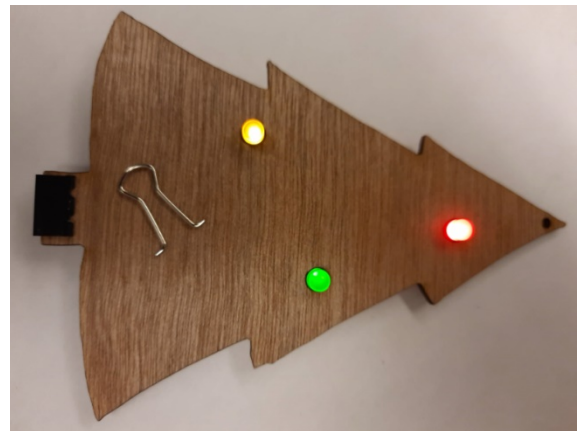

8) Place the resistor as shown and tape it in place

9) Continue with copper tape down to the "Tree Trunck" as shown

10) Place a Binder Clip over the "Tree Trunk", making sure it clips to the Copper tape. Then "Flip the switch"

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

12) Remove the Binder Clip handle from the front of the tree. You are done!!!