

Balloon X Cumbria Practical 1 – Soldering

Note 1: Please agree with your parents when and where you are going to do this

Note 2: Please view both videos linked below before you start

Note 3: If you get stuck, then ask for help from the team member who had the kit before you.

Note 4: Soldering irons are HOT. Be careful. Lead solder is also toxic if you ingest it, so wash your hands afterwards. The smoke which comes off when you solder is not lead, it is flux. However, you should be in a ventilated area.

Note 4A: The heatgun is HOT. Be careful.

Note 5: Work on a mat or a board

1. YouTube videos
 - a. Please first view the following YouTube videos:
 - i. Top 10 Things NOT to do when Soldering - Intro to Soldering Safety Video
 - ii. Skillbuilder: Learn to Solder
2. Equipment (**to return please**):
 - a. Soldering station;
 - b. Wire strippers;
 - c. Wire cutters;
 - d. Lead solder;
 - e. Lead free solder;
 - f. Tip cleaning pot;
 - g. Lead solder;
 - h. Battery pack (please cut this off **close to the board so the next person has some wire to work with**, when you have finished and return it);
 - i. Breadboard – the plastic block with terminals;
 - j. Heat gun;
 - k. Multimeter;
 - l. Desoldering tool (just in case you need it!);
 - m. Helping hands
3. Parts (**to keep**)
 - a. Stripboard – the sheet with copper tracks;
 - b. Switch;
 - c. Resistor;
 - d. A length of wire;
 - e. Shrinkwrap tubing
4. Practical (Part 1) – joining wire:
 - a. Cut your piece of wire in two;
 - b. Use the wire strippers to strip approx. 0.5cm of the end of each piece;
 - c. Join them with leaded solder (solder station temp 340 centigrade) – as per the skillbuilder video ;
 - d. TURN OFF solder station;
 - e. Shrinkwrap the join;
 - f. Strip the other ends of the cable and test “continuity” (set the multimeter to a suitable value (take a picture);
 - g. Please remember to turn the multimeter to off when not using it.

5. Practical (part 2) – building a circuit (circuit diagram below):
 - a. See if you can identify the resistance of the resistor without measuring it (look at the bands);
 - b. Test to see if you are right with the multimeter;
 - c. See if you can work out how the switch works (it has four legs and joins opposite pins when you press it – the question is, is it the pins on each side or the pins opposite each other). Use the multimeter;
 - d. Test the battery pack voltage using a suitable setting on the multimeter. It should not be too surprising! Look at the voltages of the batteries;
 - e. Look at the LED – notice that it has a flat side and a longer leg. What do these mean? If you get the LED the wrong way around, your circuit will not work (because it is a diode!);
 - f. Create your circuit on the breadboard and test it. Think very carefully about where the electricity is going to flow;
 - g. Take a picture of you pressing the switch with the LED on;
 - h. Build your circuit and test it– use leaded solder but you can try lead free (add 40 centigrade to the soldering station). I suggest you start with the switch;
 - i. Take another picture of you pressing the switch with the LED on.
6. Please blog your picture and any thoughts.
7. Please return the equipment and the battery pack (please cut this off **close to the board and strip 0.5 cm off the ends so the next person has some wire to work with,**)

