



Maze Rescue Victims

We have now been through several iterations of designing the “victims”: for the Maze Rescue competition.

The current victims have proven to be easy and cheap to build as well as being robust and safe in operation.



They are powered by any USB outlet. We use power packs and multi-port chargers in the competitions but anything 5V supply will do.

On operation the victims reach between 35° and 40°C and draw around 0.7 A.

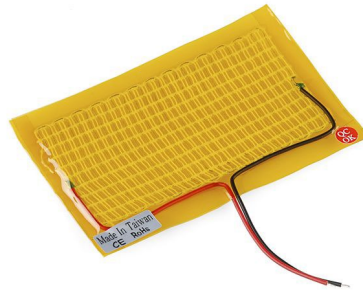
You will find that the temperature increases rapidly at first and then gradually ramps up over time. We turn the victims off between rounds. Also beware that heat will “leak” through to the other side of the wall over time which may also become an issue if the victim is in the same location for too long.

The coloured tape allows identification by vision while the reflective tape is a temporary addition for Lego robots programmed in the standard software. Under the current rules only half the victims in any round will have the reflective tape.

It is best to have a wire stripper, soldering iron, solder, insulating tape or heat shrink. A heat gun or strip heater would be useful if you wanted to make the backing plate out of acrylic.

Materials Needed (example suppliers only – items are widely available)

1. Heating Element – 5 X 10 cm (\$7.90)



<https://core-electronics.com.au/heating-pad-5x10cm.html>

2. USB-A cable (easiest to chop up one that is no longer being used – otherwise just get a cheap around a metre long)
3. Fluorescent “Gaffa” tape (\$8.46 for 48mm X 13m)



<https://www.officeworks.com.au/shop/officeworks/p/duck-duct-tape-neon-pink-48mm-x-13-71m-dk1265016>

4. Aluminium foil tape (\$17.95 40mm X 50m roll) – can also be used for checkpoints



<https://www.jaycar.com.au/aluminium-foil-tape-50mm/p/NM2860>

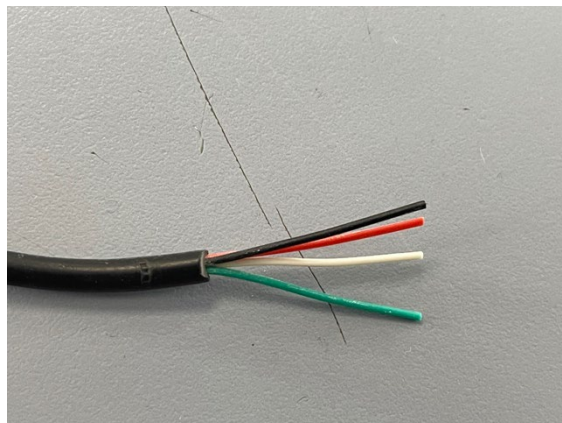
5. Something to mount the victim on. We bend up a bit of acrylic but you could use a piece of thin ply or a 3D printed hook. Ours just hang over the top of the wall (easy to move) but you could fix to the wall with double sided tape or hook tape.

Method of construction

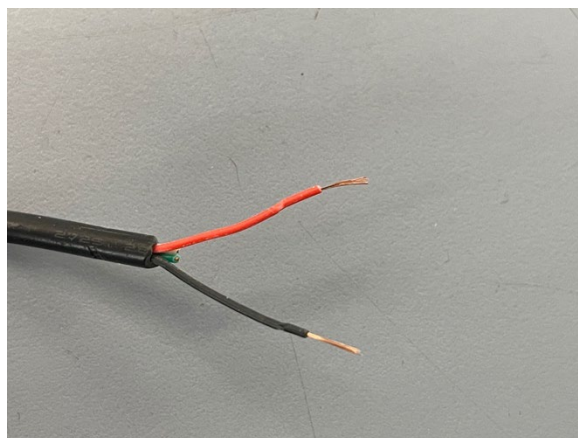
- a. Cut of the end of the USB cable that normally connects to the device – we are only using the end that plugs into the power supply or computer.



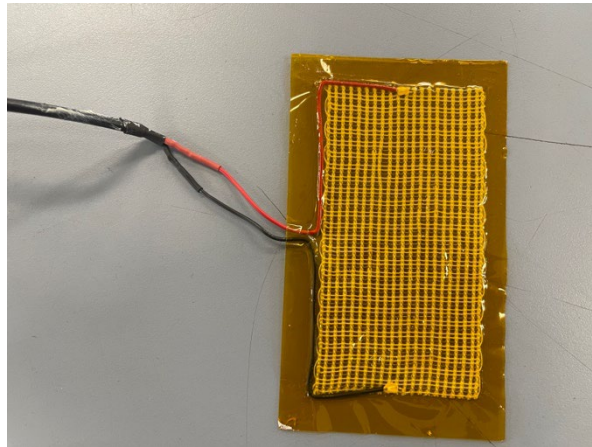
- b. Strip back outer layer of cable for around 25mm.



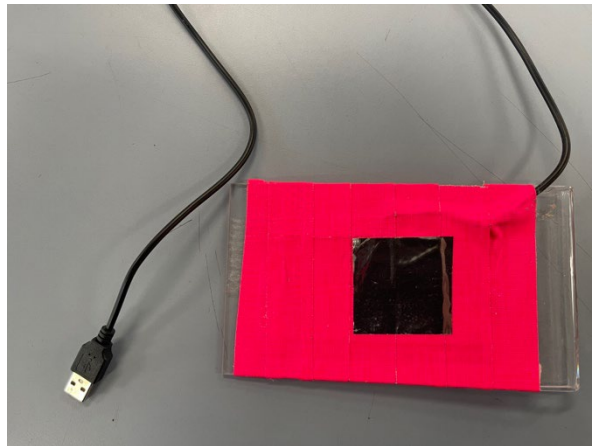
- c. Snip off all the small wires except the black and red ones – these carry the 5V supply.
- d. Strip back the red and black wires for around 10mm.



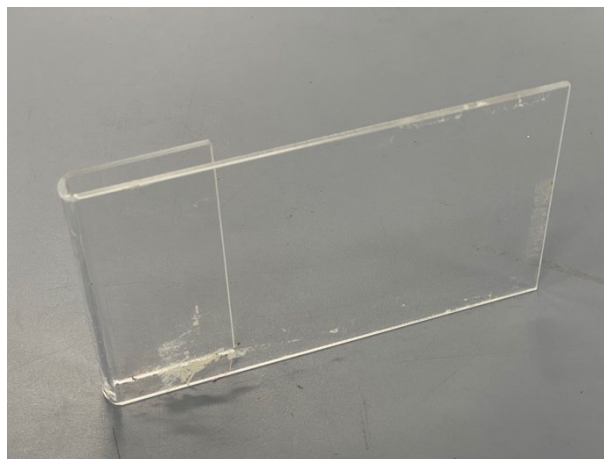
- e. Solder the lead to the heating element wires taking care to properly insulate the connections. We don't want a fire! It doesn't matter the order in which the wires are connected but I like matching red to red and black to black.



- f. Fix to mount using fluorescent gaffa tape



- g. We cut a piece of clear 3mm acrylic approximately 240 mm X 100 mm. We then use a strip heater to soften the plastic (approx. 50mm from end) and form it over the wall. When mounting the heating pad make sure that the centre of the pad is centred approximately 70mm up from the floor.



All done!