

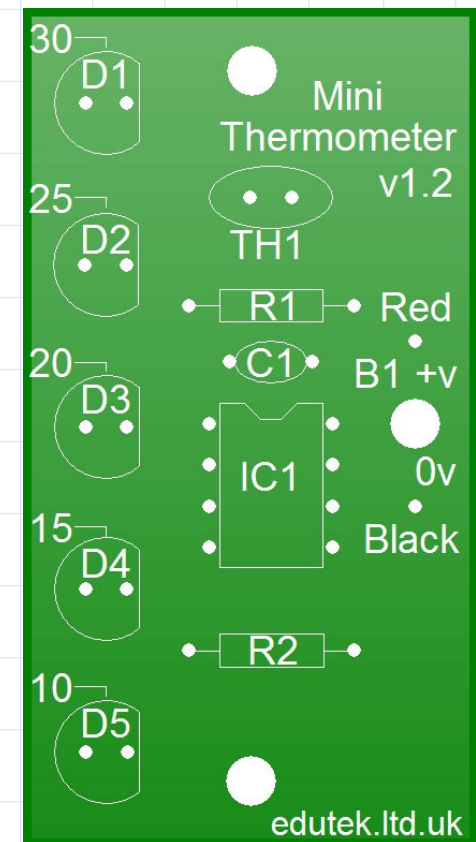
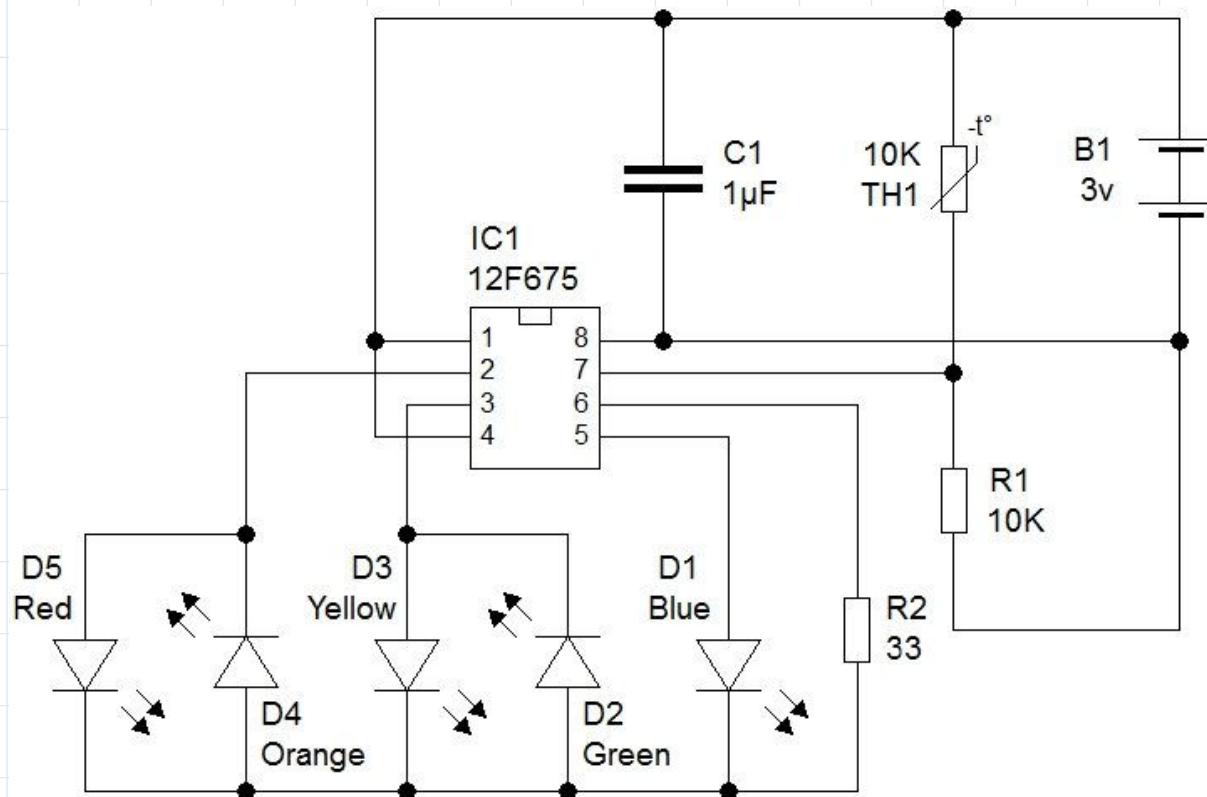
COLOUR THERMO KIT



EDUTEK LTD - VER 1.2

CIRCUIT DIAGRAM

The Colour Thermo circuit is shown below with the circuit board (PCB). The components have labels, such as R1 and IC1 which can be matched up on the board. You can also see the outlines of the components to help you place them.



RESISTORS

There are 2 resistors.

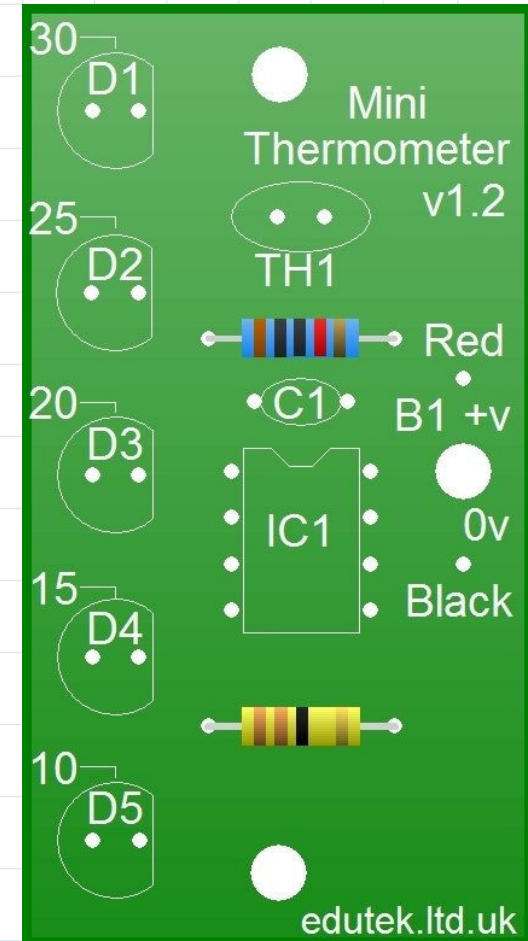
R1 = 10K Ohm (blue background)



R2 = 33 Ohm (tan background)

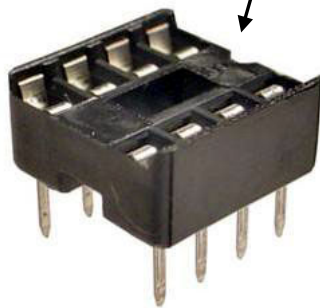


Bend the wire legs close to the resistor at 90 degrees to fit them into the board.
These can be soldered into the board either way round.

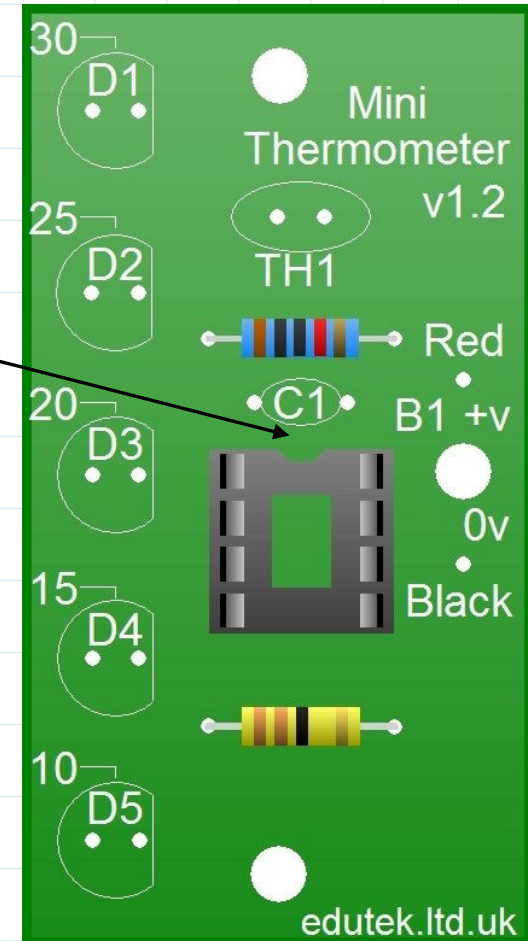


IC HOLDER

The IC holder is inserted into the IC1 holes. It has a notch at one end, this is the top.



The IC holder is useful if you need to change the IC. If you want to solder the IC directly to the board, you can skip this stage.



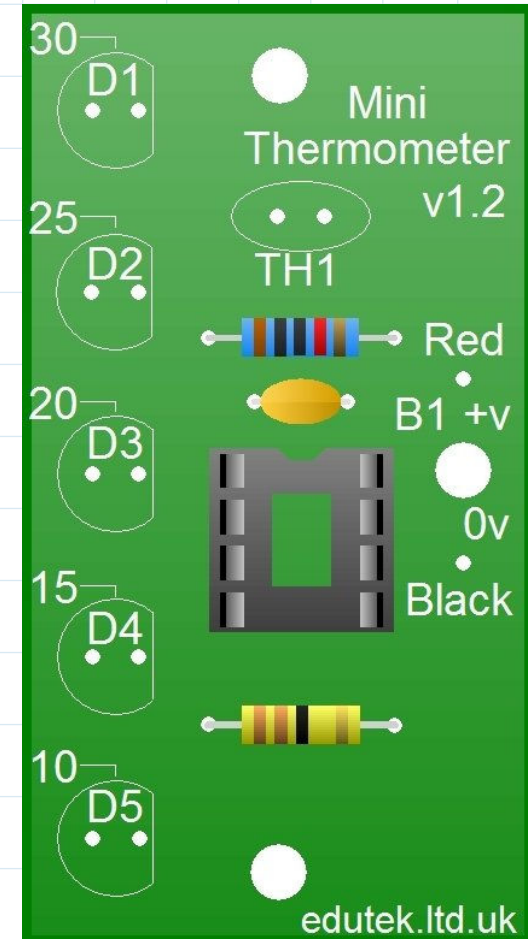
Insert the holder into the board, then bend two opposite pins to keep the holder from falling out while you are soldering.

CAPACITOR

There is one capacitor, C1.
It is a ceramic type.



It can be inserted either way round.

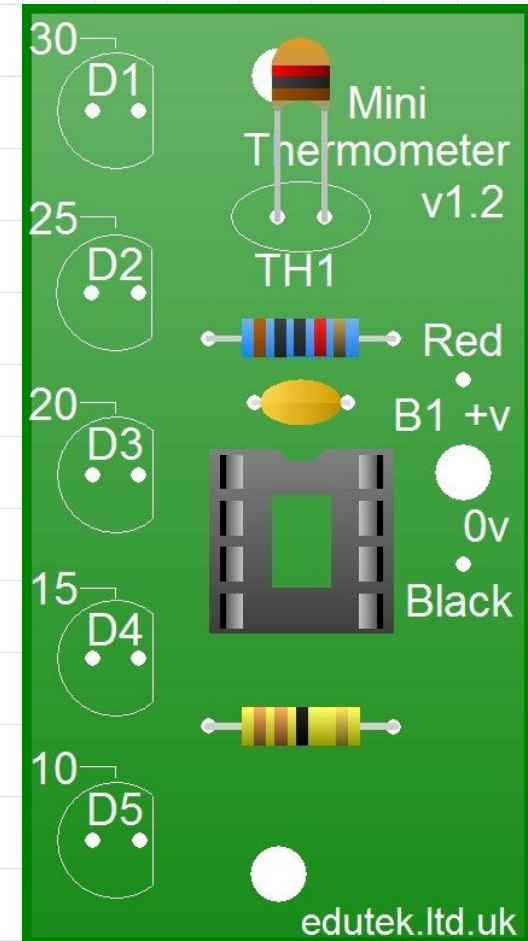
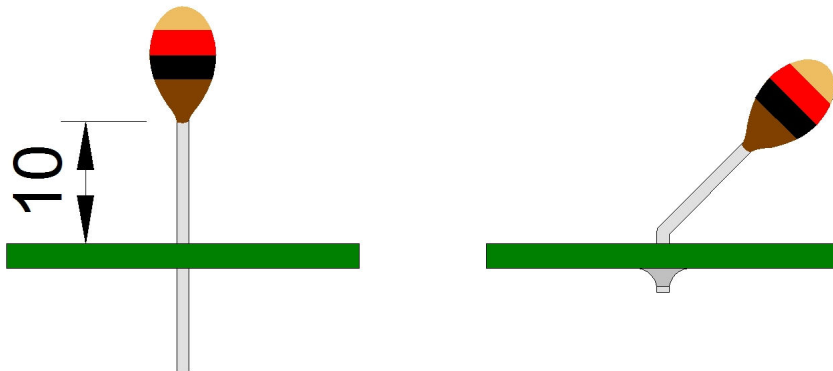


THERMISTOR

The Thermistor, TH1, is the sensor that monitors the temperature.



Only push it part way in, leaving it about 10mm from the board, and solder it into place. Then bend the sensor so it is angled at 45 from the board.



LEDS

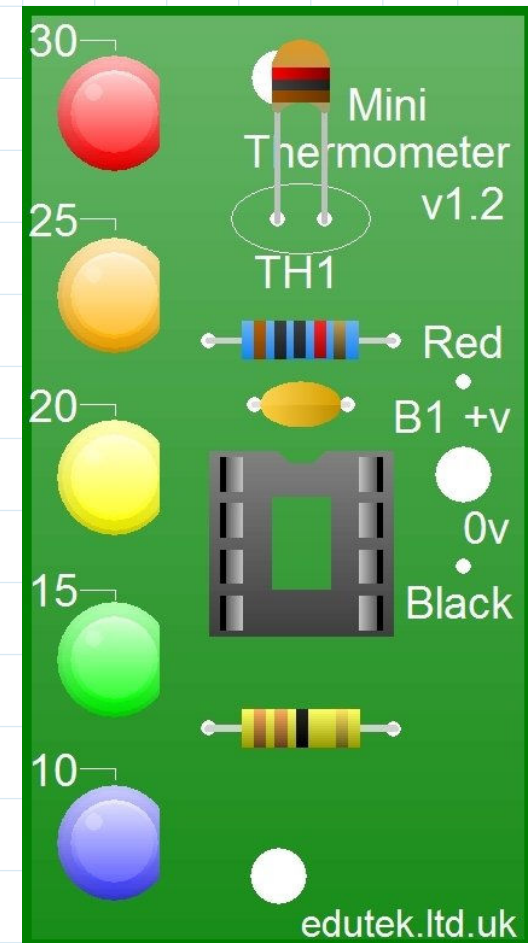
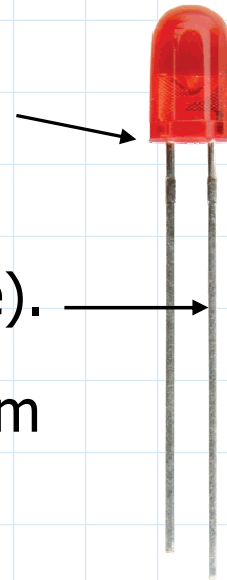
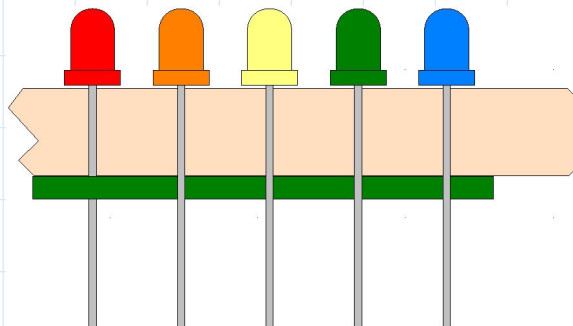
There are 5 LEDs of different colours, D1-5. Insert them as shown.

Each LED has a flat section on the rim. The wire next to the flat is the cathode (negative) connection.

The long wire is the anode (positive).

To place the LEDs evenly, cut a 7mm wide strip of 1mm card and slide it under the LEDs between the wires while soldering, to act as a spacer.

Card

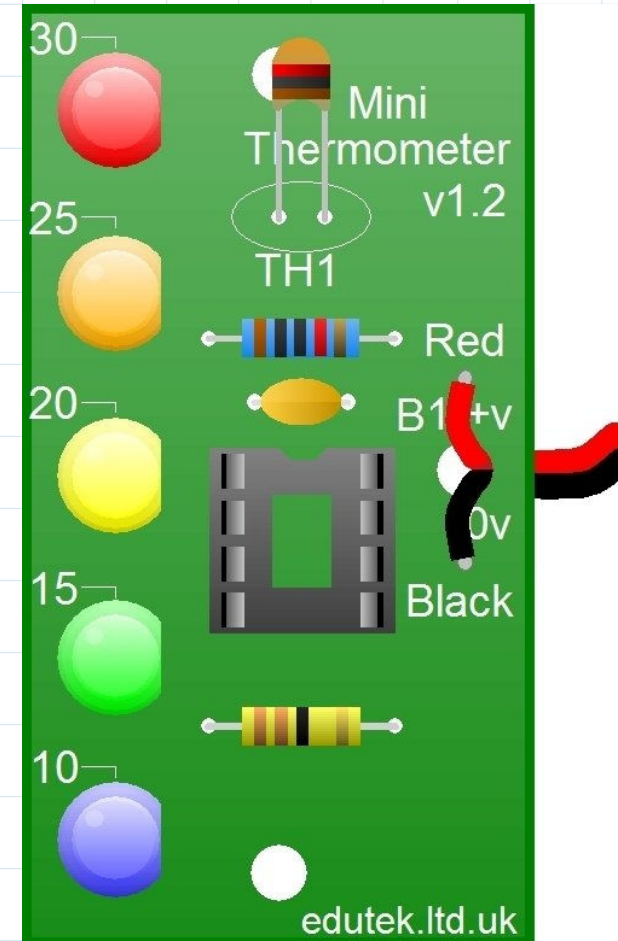
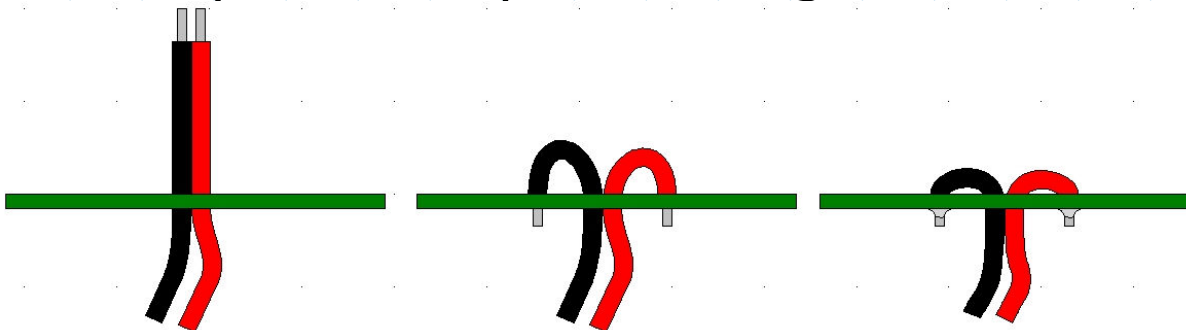


BATTERY HOLDER

The battery holder holds 2 AA batteries and has flying leads, red and black.



To stop the wires breaking, feed them up through the hole marked "B1" and then into the 2 holes marked "Red" and "Black". Solder them in place then pull them tight from below.

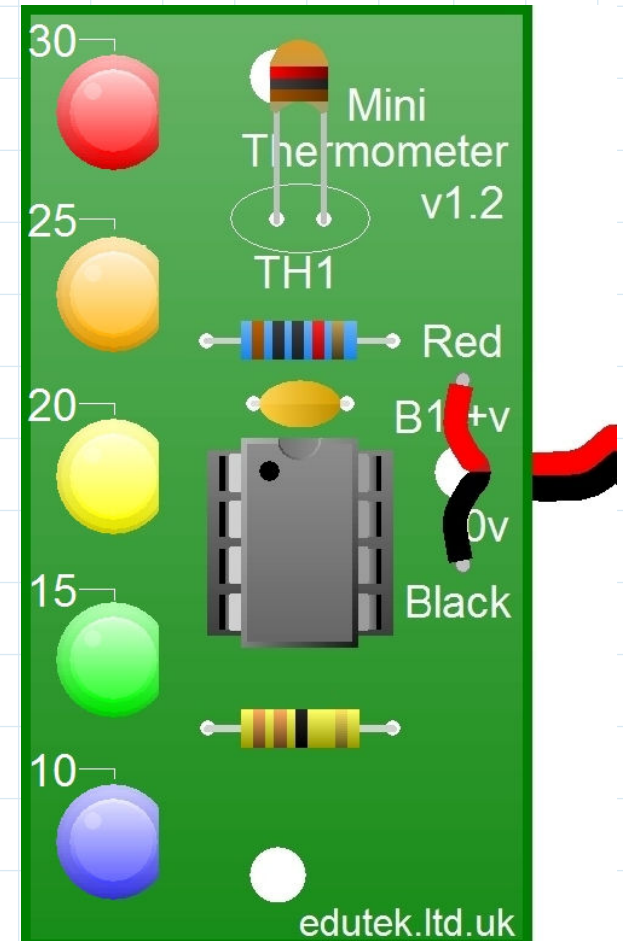


INTEGRATED CIRCUIT

The Integrated Circuit, IC1 can now be inserted into the IC socket.



It is important that the notch on the top of the IC is facing upwards, to match the notch on the IC holder.



The pins can be difficult to insert. Try putting in one row first, pushing to the side slightly, and then the other row.

USING THE COLOUR THERMO

When the circuit is powered up, all the LEDs should flash to check they are all working.

The LEDs are calibrated as follows:

Blue	10°C
Green	15°C
Yellow	20°C
Amber	25°C
Red	30°C

When 2 LEDs are on, it means the temperature is more than halfway between the 2 readings:
eg. Green & Yellow = 17.5-19.9°C

Flashing blue LED means $<10^{\circ}\text{C}$
Flashing red LED means $>35^{\circ}\text{C}$

Note:

The Thermo will need at least 15 minutes to stabilise after soldering. During this time it is likely the red LED will stay on or flash, if power is applied.

You can increase the voltage to 4.5v by adding another AA battery. This will make the LEDs brighter so it can be used as a Temperature Mood Light.

FAULT FINDING

1 - Nothing is functioning, check...

- the batteries inserted correctly
- IC1 is inserted correctly with all pins inserted
- there are no short circuits between solder pads

2 - Some or all of the LEDs do not light, check...

- the LEDs are inserted the correct way round
- there are no short circuits between solder pads

3 - The red LED is always on, check...

- all the pins of IC1 are in place and not bent
- IC1 is inserted correctly with all pins inserted
- there is no short circuit between solder pads of TH1