# Circuit Construction – Transistor Switch Nightlight

The circuit diagram on the right is the circuit for your nightlight. It is called a transistor switch circuit and it uses an LDR to detect changes in light levels, when it is dark the transistor switches on and this switches on the LED.

When the LDR is dark it has a very high resistance which cause the base of the transistor to rise above 0.6V, this is enough to turn on the transistor and LED, when it is light the LDR has low resistance and this turns off the transistor and LED.

The circuit can also be used as a light detector, moisture sensor or temperature sensor.
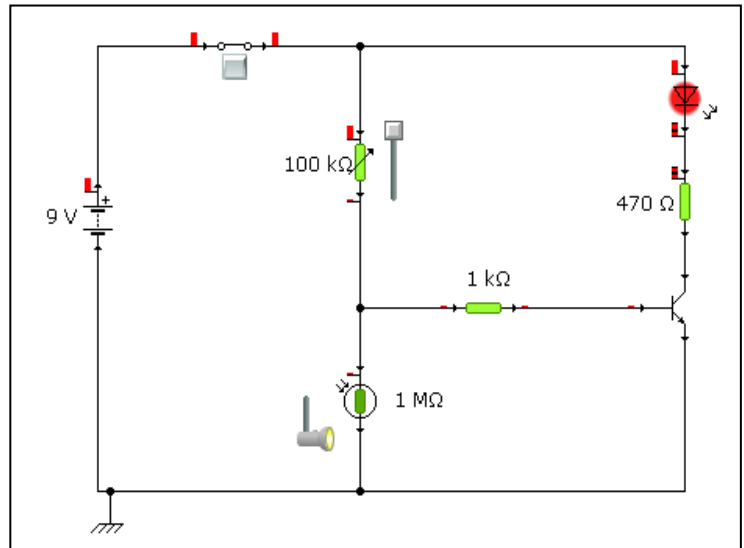
Circuit example, see below for a schematic

You will need to collect the following equipment before you start soldering your circuit:

- Soldering iron and stand
- Damp sponge
- Solder wire
- Side cutters
- Pliers
- Components: T1 – MPSA13 transistor
  R3 – 470R resistor (yellow, violet, brown)
  R4 – 1K resistor (brown, black, red)
  R2 – LDR
  R1 – 100k preset resistor or 47k resistor (yellow, violet, orange)
  SW1 – Power switch
  Battery – Battery clip
  LED
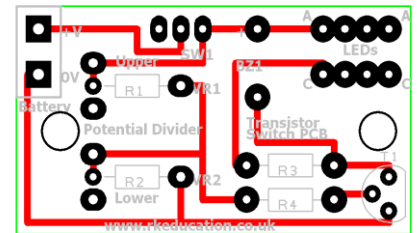
Procedure for construction

1. Solder the resistors into your PCB, take care to insert the correct resistor into the correct place, if in doubt ask your teacher. When soldering be sure to heat the area sufficiently but not too much as it will damage the PCB.
2. If you are using a preset resistor solder this in place.
3. Solder the transistor in place, be careful as the transistor legs are close together, be sure not to connect the legs together as this will stop the nightlight working. When inserting it do not force it down to far.
4. Solder the LDR in place, when inserting it into the PCB do not force it down to far.
5. Solder your power switch in place
6. Solder your battery clip in place
7. Solder your LED into the PCB, if you have attached flying leads insert these, be sure to get the LED the correct way around, remember the long and short legs…

Transistor Switch project Schematic - www.rkeducation.co.uk