



Make a nightlight

Crumble blog 5

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Follow this step-by-step guide on how to make a nightlight.

Associated resources:

Crumble lesson plan

Crumble PowerPoint – nightlight

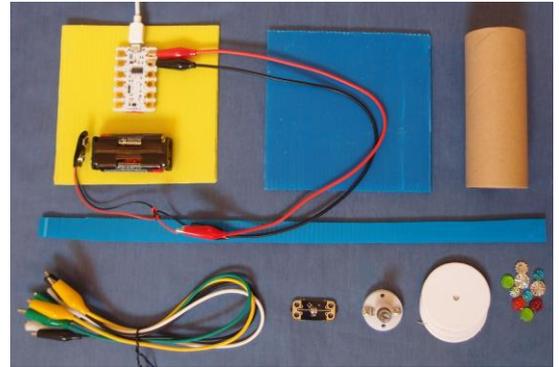
Crumble blog 1 – set up the controller

Crumble workbook 5 – nightlight

You will need:

Parts included in class kit

- 1 Crumble controller unit (see Crumble blog 1)
- 1 square of corrugated plastic 12.5 cm x 12.5 cm
- 1 cardboard craft roll
- 1 strip of corrugated plastic 1.5 cm x 39 cm (the corrugations must be across the strip, not along it)
- 4 crocodile leads
- 1 LDR (light dependent resistor)
- 1 lamp
- 1 lamp holder
- 3 card discs
- Coloured gems



Other parts, tools and consumables

- Paint & paintbrush (optional)
- Pair of compasses
- Large scissors
- Double sided tape
- Ruler
- Pencil
- Low melt glue gun & glue sticks
- Computer (see Crumble blog 1)



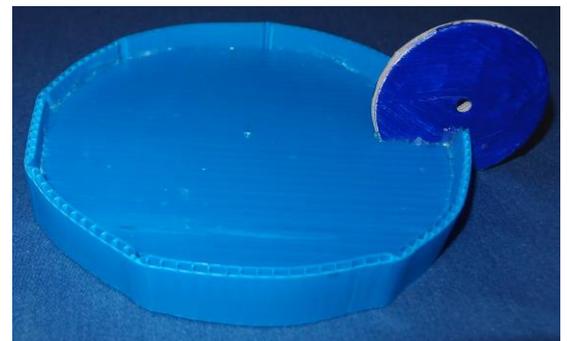
Step 1

Paint your craft roll and/or card discs and leave them to dry (optional).



Step 2

To make the candle holder, use the protractor to mark out a circular base on the square of corrugated plastic and cut it out. To make the handle, cut a slot in two of the card discs and slot them onto the edge of the base, gluing them firmly in place. Glue the strip of corrugated plastic around the edge of the base, starting with one end butted up against the handle. Trim the other end so that it also butts up against the handle.



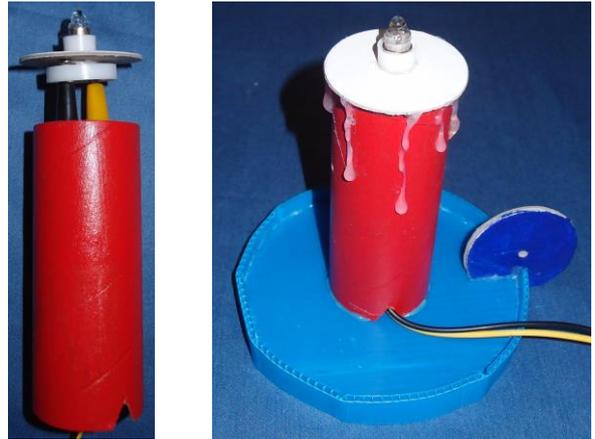
Step 3

Take the third card disc and use the nose of the scissors to enlarge the hole in the middle until the nose of the bulb holder can just be pushed in (it should be a tight fit). To do this, push the nose of the scissors into the hole and rotate the scissors to make a smooth round hole. Trim off any rough edges.



Step 4

Glue the bulb holder to the card disc. Clip two crocodile leads firmly to the lamp terminals (screws) from underneath. Cut a vee 0.8 cm long in the bottom of the craft roll. Feed the crocodile leads down through the craft roll and glue the card disc to the top of the craft roll.



Step 5

Tuck the crocodile leads into the vee and glue the bottom of the craft roll firmly down onto the base, with the crocodile leads sticking out.

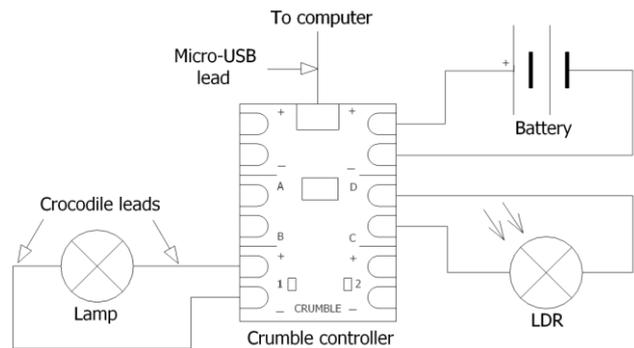
Step 6

Cut a 1.2 cm x 1.5 cm rectangle from corrugated plastic offcuts. Use the double sided tape to stick it onto the bottom of the LDR (the side without the components). Glue the other side of the plastic firmly down onto the base. Clip the two remaining crocodile leads onto the terminals on either side of the LDR. Cut notches in the side of the candle holder and feed the crocodile leads out through them.



Step 7

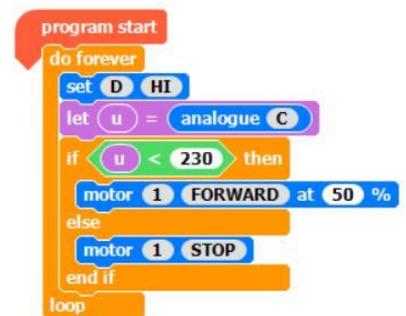
Connect the two crocodile leads from the lamp terminals to the Motor 1 terminals on the Crumble. Connect the two crocodile leads from the LDR to terminals C and D on the Crumble. In both cases it doesn't matter which way round they are connected. Clip the snap battery connector onto the battery holder.



Step 8

Construct and run the following program. This program sets the output D to high. It then checks if the signal received at C is low and if so it switches on the lamp. Cover the LDR with your hand and check the lamp lights up. Take your hand away, and the lamp should go off.

(The LDR is made from a material whose resistance changes with the light level. When light falls on it the resistance falls, so if D is set to high then C will also be high. If the LDR is in the dark then the resistance goes up, and so C becomes low and the lamp comes on.)



Step 9

Decorate your candle and candle holder.

Step 10

Unclip the snap battery connector from the battery holder when not in use to avoid draining the battery.

