



## The Lighthouse project

*Ideas for crafting*

## General considerations

Crafting/ handcrafting is considered as a pivotal point and a complementary task that can imbue meaning to the project. Through the crafting process (highly interwoven in the robotic artefact construction) students become more engaged to the entire process as they explore of a number of engineering and design concepts, and they consider multiple solutions in order to achieve the results that they want.

The present document contains four different ideas and approaches on crafting for the lighthouse project. Each of them is based on the use of simple (and recyclable) materials that can be easily accessed and modified. The proposed techniques and the corresponding steps are optional and indicative. Students should be encouraged to use any material they like as well as to experiment with different designs, forms and constructing techniques. In this way they will be able to overcome any design-related problem (e.g how to create a stable structure, how to embed the light or the photoresistor to the construction etc.).

**- Empty plastic bottle**

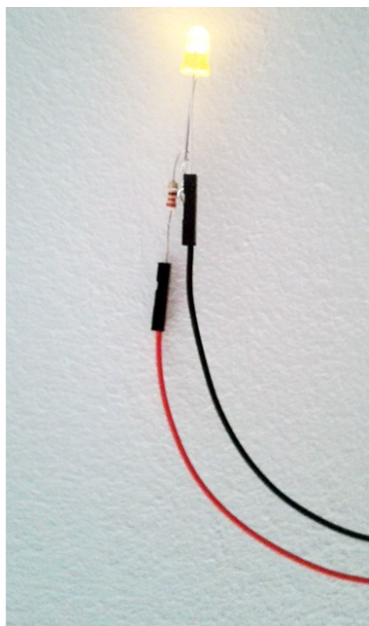
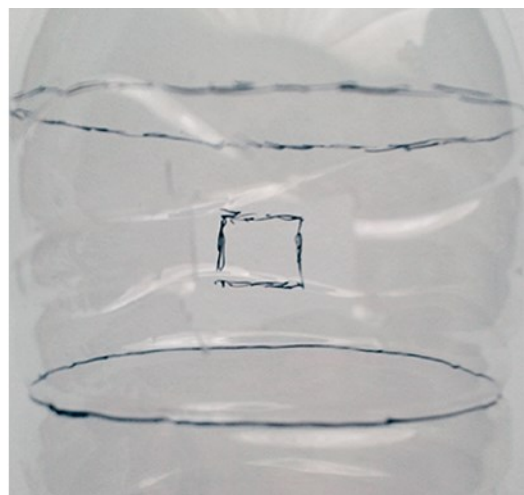


The following images depict the procedure of modelling a lighthouse by using an empty plastic bottle. Apart from the bottle, students will need a marker, a cutter, paints and/or colored papers.

The students, with the assistance of their tutors, will initially cut a small hole at the bottom of the bottle while with the marker they can highlight the surfaces that they want to paint.

Then they can paint the bottle or, if they wish, they can use colored papers in order to cover/decorate it.

Finally they can use longer jumpers in order to manage to embed the LED to their model/construction.



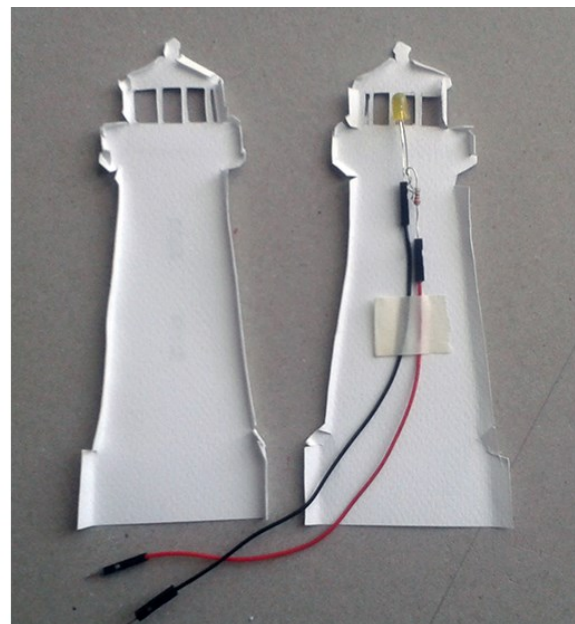
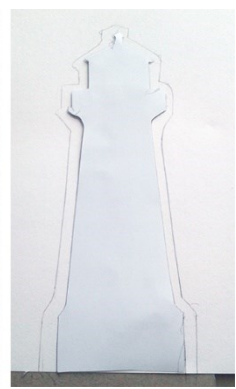
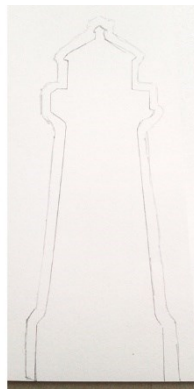
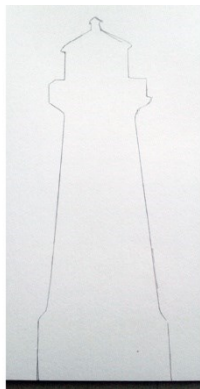
## - 2D double-faced paper model



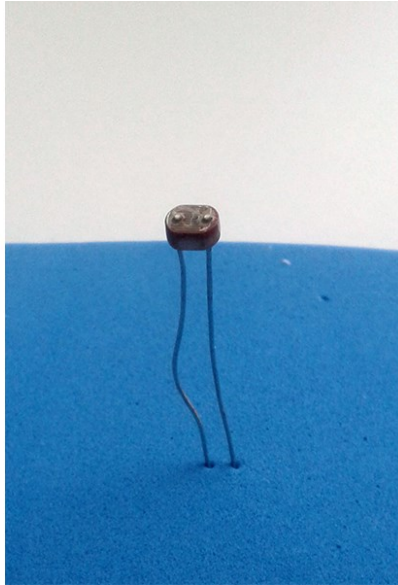
The following images depict the procedure of modelling a lighthouse by using a printed image and a white piece of paper. Apart from these, students will also need a marker, a cutter or scissor, paints, glue and/or paper tape.

The students will initially cut the printed image and trace the contour of the depicted lighthouse on the paper. Next they need to create a second contour (2-3mm outside the first one), and cut the sketched model. After, they should fold the area between the two contours and repeat the entire procedure in order to create the back of the lighthouse. If they wish, they can paint the two models.

Finally, they can embed the LED to their construction, by placing it to the interior of the two models and sticking them together. If they wish, they can use a foamed surface to cover the Arduino Board and the breadboard







## - 3D paper model

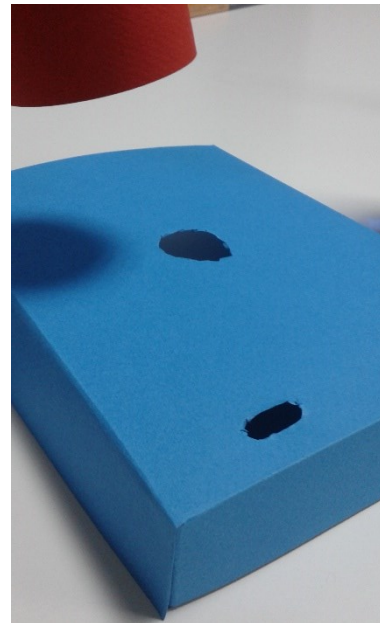


The following images depict the procedure of modelling a lighthouse by using a number of colored papers. Apart from the papers, students will need a cutter or scissor and glue.

The students will initially create a cylinder, by rolling one of the colored papers. If they wish, they can use some stripes from a different colored paper to decorate their construction. They can also create some windows by using the cutter.

Finally, they can use some rather longer jumpers in order to place the LED on the top of their model/construction. Alternatively, they can use copper tape, which can be stack at the interior of the cylinder.

They can also form a base so as to cover the Arduino board. If they do so, they should create two holes for the photoresistor and for the jumpers.



## - Model from paper cups



The following images depict the procedure of modelling a lighthouse by using paper cups. For this model, students will also need a cutter or a scissor, a paper tape and paints.

The students, with the assistance of their tutors, will initially cut a small hole at the bottom of the cup. Then they will cut a second cup in two parts.

Then, they have to connect the upper part of the second cup with the initial cup. Next, with the use of the paper tape, they can stick a third cup on the already made model. In this way, the lighthouse can become higher.

Finally, they can place a LED on the top of their construction. If they wish, they can use the lower part of the second cup as a roof. They can also use paints to decorate their lighthouse.









## **ROBOSCIENTISTS PROJECT**

Motivating secondary school students towards STEM careers through robotic artefact making

**Erasmus+ KA2 2018-1PL01-KA201-051129**

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### **Declaration**

This report has been prepared in the context of the ROBOSCIENTISTS project. Where other published and unpublished source materials have been used, these have been acknowledged.

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