

The Weather Station 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 ideas and solutions on crafting for the weather station project. For the purpose of crafting the use of simple (and recyclable) materials that can be easily accessed and modified is highly recommended. The proposed solutions 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 circuit to their model etc.).

- Creating a compact weather station

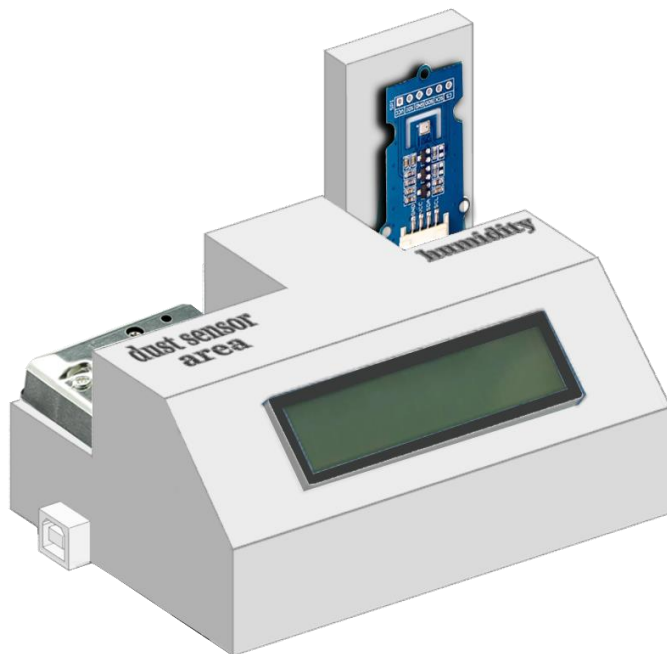


Figure 1 depicts an indicative paradigm of creating a rather compact weather station in which all the components are embedded on the main structure. Arduino board with the Grove base shield, as well as the Grove LCD RGB display are embedded on a box-like structure created by cardboard, while the humidity B280 sensor and the optical dust sensor are placed on the structure and in ways that can be exposed to the external (weather) conditions.

Encourage your students to design the pattern of the model on a cardboard sheet. However, before that inform them that it might be a good practice to measure all the components in order to create a box/structure in which the Arduino board as well as the sensors will properly fit. Remind them that the humidity and dust sensors should not be covered in order to properly sense and measure the external conditions. After creating the pattern, encourage them to cut and stick together all the designed parts, or carve and fold some edges in order to create a more stable structure. When their structure is ready encourage them to further decorate the model by painting it, using colored papers, or even by adding labels (i.e., dust sensor area, humidity sensor etc.) giving information regarding the use of every sensor.

With proper modifications, a ready-made box can be also used for the creation of the base.

- Expandable weather station

Alternatively, the model from the previous paradigm can be modified to a deployed structure that will permit to the sensors to be extended by the main structure, thus receiving multiple weather/external conditions. For example, the bases for the optical dust sensor and the humidity sensor can be horizontally and vertically detached from the main structure, thus receiving different, and probably more reliable, measures.

- More ideas...

Encourage your student to use their imagination and think how they can use various and/or different materials in order to create a weather station. Popsicles for example can be also implemented for facilitate the creation of extended parts. Papier-mâché could be also an alternative technique for modelling and decoration.

You can also encourage them to search on the internet and especially in sites that promote – among others – sharing, such as Arduino project hub (<https://create.arduino.cc/projecthub>) and instructables (<https://www.instructables.com/>).

ROBOSCIENTISTS PROJECT

Motivating secondary school students towards STEM careers through robotic artefact making

Erasmus+ KA2 2018-1PL01-KA201-051129

Creators

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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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