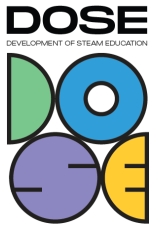


TEMPLATE for BEST PRACTICE EXAMPLES - SOLVED TASK



1. **Name of the task:**
A house with a growing/recreation area
2. **Why did you choose this task?**
Because of the rising sea level and decreasing amount of livable area
3. **Subjects covered from STEAM areas:**
Physics, IT, chemistry, biology, and technology.
4. **Target group (age range and size of the group):**
Group size: 5, ages 15-18
5. **Duration of the activity:** 20 hours
6. **Keywords:** Microorganisms, fountain, algae, seaweed.
7. **A key sentence describing the context of the activity, followed by a short description (200 words):**
In our proposed model algae (seaweed) play a dual role in food production and at the same time, they purify water.
The fountain, included in the house, also has a double meaning, first of all, it is one of the elements of the recreational area. And the second purpose is for circulating water. It is known that circulating water is healthier. As a result, water with more oxygen is better for algae growth. The artificial micro ecosystem works in the same way as in nature. All of its parts must work together to maintain balance! The atmosphere supplies living organisms with carbon dioxide (for photosynthesis) and oxygen (for respiration). Evaporation, transpiration, and ongoing processes between the atmosphere and the Earth's surface. Solar radiation warms the atmosphere and evaporates the water. Light is also essential for photosynthesis, providing plants with energy for growth and metabolism. Prior to the production of the prototype, it was decided that it would be a multi-apartment residential building protected from possible floods, so it would be lifted from the ground on platforms and a rooftop recreation area with algae and a fountain. After the production of the prototype, it was decided to study the effect of acid rain on microorganisms and algae, as the problem is relevant today.
8. **Description of the activity environment, including the list of materials and tools needed:**
FabLab. Tools used to create the prototype: secondary raw materials (acrylic glass fragments, old computer cases), car window cleaner pump, plastic hoses, plywood, metal mesh, algae, pond water, sensors (temperature, acidity), 3D printer.

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9. **Step-by-step, detailed description of the activity, including teaching and learning strategies:**

First of all, we have to decide what the final product will look like. The students designed the architecture of the final project, designing the reservoir for the algae and water places. After designing the final product, technical issues have to be resolved. For example, making the base plate for the cutouts for the water recirculation tube, designing and creating the pumping mechanism, and giving the water-pulling tube the correct atmospheric pressure so it pumps water not just air. The decoration part of the house is also important, as a result, the designing of the outside and minor decorations should be discussed. The decoration should not affect the water.

10. **Learning objectives/competencies:**

Create a prototype of a residential house with a recreational and food-growing area on the roof that will be protected from flooding.

Create a water circulation system.

Investigate the effects of acid rain on microorganisms and algae.

11. **Evaluation/Assessment guidelines:**

Firstly the fountain has to have continuous water flowing so the algae do not dry up and a filter to prevent the pump from clogging up with the snails that grow with algae. An indicator of successful project development would be an increase in algae which confirms that the food source is replenishing.

12. **Lessons learned:**

The pH of the water plays a big role in the development and reproduction of algae. The importance of atmospheric pressure.

13. **Additional information/Links:**

14. **Contact person:** Alytaus Putinų gimnazija, Lithuania, Deimantė Januškauskaitė
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