Water as a source of energy - Constructing water turbine

1	**Overall aims:** ● Introducing a concept of water energy - allowing children to observe the operation of the water turbine ● developing the ability to listen to and follow the teacher's instructions; ● developing observation skills ● developing teamwork skills ● enriching children's knowledge about hydropower/ renewable sources of energy
2	**Vocabulary - keywords** water turbine, water energy, hydropower, renewable sources of energy
3	**Sustainable abilities developed** ● Systemic thinking competency ● Collaboration competency ● Integrated problem solving
4	**Pillars of sustainability included** ● environmental/ ecological ● economical
5	**STEAM domains** S, T, E, M

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6 Teaching methodologies/activity outline

Introduction

Conversation about different ways of using water by humans:

- What do we use water for?
- When and where can we use it?
- What do we use water for in everyday life?

Educational movie: "From mill wheels to hydropower plants":
https://www.youtube.com/watch?v=avyh-MMXBjo

Main part

Construction of a water turbine. The children are divided into groups. Before starting the class, the teacher cuts off the upper part of the bottle and makes two cuts on its opposite sides, about 2 cm deep and about 3 mm wide. The card is cut into four identical parts. He makes four notches on the cork to insert each of the four parts.

Children create a turbine by combining the elements. They insert the four parts of the card into the notches on the cork (This is how the turbine wheel was created). Then, on both sides of the cork, toothpicks or cut skewers are inserted.

Finally, the teacher asks the children to point the water bottle at the rotor blades. Children observe the movement of the turbine and explain how hydropower is created.

Summary

A conversation about the importance of water and how every drop is important to create electricity. Why are some energy sources (such as turbines or hydroelectric power stations) called renewable? What other renewable energy sources do you know besides water?

7 Expected learning outcomes

The child will be able to:

- Follow instructions for building a water turbine
- Explain the importance of water in the process of creating renewable energy
- Observe
- Work in small teams

8 Assessment

Formative assessment - observing the process of learning, assessing the ability to explain the concepts with own words

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9	**Equipment and materials to be used in learning unit (tools, ingredients etc)** Materials for each group (prepared appropriately by the teacher): plastic bottle; plastic card (no longer needed), plug/ cork, scissors, knife (for the teacher), two toothpicks or skewers, bottles filled with water.
10	**Kind of setting - lab, kitchen, outdoor etc.** Classroom or preschool garden
11	**References - source:** https://www.youtube.com/watch?v=avyh-MMXBjo https://tuptuptup.org.pl/projekt-inzynieryjny-energia-wodna/
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