Developing STEAM skills with the simulation of evaporation and rain in an aquarium

1 Overall aims:

Cognitive

- To improve the knowledge of the water cycle
- To understand and check the changes of water's state in the water cycle
- To improve the knowledge and respect about the natural world and resources

Affective

- To experience the feeling of success
- To express their emotions through their creations
- To take care of the planet saving the water

2 Vocabulary - keywords

Science: Evaporation, condensation, precipitation, water cycle, changes of water's state

Sustainability: water resource, atmospheric gasses, save water

Engineering Practice: developing and using models

Art: Artist's clay or plastic mountain model

3 Sustainable abilities developed

- Anticipatory competence
- Critical thinking competency (Understanding of the water cycle and the importance to save water)

4 Pillars of sustainability included

- Environmental sustainability: the importance to save the water for all the life of the planet
- Social sustainability: saving water at home (bathroom, Kitchen, garden) to save the planet

5 STEAM domains

- Engineering skills: developing and using an aquarium model

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- Science skills: designing an experiment to test the water cycle, hypothesize, observation of state changes, record results
- Sustainable skills: take care of the planet saving water
- Artistic skills: design a mountain model

6 Teaching methodologies

1. Teacher Introduction: 30 minutes
2. Activity as Demonstration: 30 minutes
3. Activity as Group project: 45 minutes
4. Discussion/Assessment: 20 minutes

7 Expected learning outcomes

The child will be able to:

- Check the changes of state of the water through an aquarium model
- Take care of the planet saving water in their daily circumstances

8 Assessment

Initial assessment: Have students answer some or all of the questions in lab notebooks for collection and evaluation.
Formative assessment: Challenge the students to use their understanding of the water cycle to explain a related phenomenon. Example:
Put 1/2 inch or so of sand or gravel in a resealable plastic bag.
Add 1/4 cup of water (color the water blue for easier visibility).
Put it in a sunny window or under a bright light.
The students should see evaporation/condensation/precipitation and infiltration take place. They should identify that transpiration was not part of the system.
Summative assessment: Evaluate the whole procedure/ Asking children about contents to know their background

9 Equipment and materials to be used in learning unit (tools, ingredients etc)

- Artist's clay or plastic mountain model
- Lamp
- Bowl of boiling water
- Crushed ice
- Large aquarium or plastic shoe boxes with covers

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10 Kind of setting - lab, kitchen, outdoor etc.

1. Classroom
2. Lab
3. Plastic art classroom

11 References - source:

The activity is from: https://scied.ucar.edu/activity/water-cycle

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