Growing up a miniature autumnal garden in class

1 Overall aims:

- Learning the growing process of plants;
- Knowing what plants usually grow up during autumn and what is not;
- Develop the ability to observe;
- Make and test hypotheses;
- Develop the value of patience;
- Interiorize the importance of recycling;

2 Vocabulary - keywords

Gardening; Recycling; Experiment

3 Sustainable abilities developed

Systematic thinking
Anticipatory competency
Self-awareness competency
Collaboration competency
Integrated problem solving

4 Pillars of sustainability included

Environmental sustainability;
Sustainable development;
Economic Sustainability.

5 STEAM domains

Science, Engineering, Art

6 Teaching methodologies/activity outline

Before the experiment:

1. Foresee a lesson by which explaining to children the life cycle of

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plants, pointing out the plants that usually grow up in autumn – explaining their characteristics.
2. Ask pupils to take plastic bottles they had already used within the family – explain to children that it would be important not to buy new plastic bottles but used bottles that otherwise will be thrown away.

During the experiment:

1. Provide students a set of buds – each bud is related to a specific autumnal plant (e.g., cyclamen or chrysanthemum);
2. Show students the images of the plants and ask them to choose which bud they want to plant;
3. Exploring with pupils how the buds will become plants;
4. Pupils, under the supervision of teachers, should cut off the top of the bottle at the point where the tube section is formed;
5. Pupils paint the bottle by choosing colors that they think match the colors of the plant;
6. Pupils fill up the bottle with the ground, inserting the bud;
7. Ask pupils to make predictions related to the necessary time, water, and light the plant need to grow up;
8. Pupils should make a plan to cultivate their plants

To know before the activity:

When it's a hot, muggy summer day, you've probably heard the word "humid." But what does that mean, exactly? Relative humidity is the amount of water that the air can hold before it rains. Humidity is usually measured in percentages, so the highest level of relative humidity—right before it rains—is 100 percent.

The activity:

Remove an empty and very cold glass bottle from the fridge, and place it in the open air, for example on the worktable. After a few minutes observe that small drops of water have formed on the outside of the glass. Surely those droplets cannot come from inside the bottle because it is empty.
It is concluded that in the air there is water vapor, which upon meeting the cold surface of the bottle, condenses and forms water droplets in a liquid state.

7 Expected learning outcomes

The child will be able to

- Follow instructions;

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	• Participate in the experiment; • Learning and explaining the growing process of plants; • Develop fine motor skills, using experimental materials (e.g., scissors) under the teacher's supervision; • Coloring and painting; • Take care of the plants (making sure there is enough light, water, etc.).
8	**Assessment** • **Initial evaluation:** assessing what pupils already know about the general concepts (e.g., the process of plant's growing); • **Middle evaluation:** assessing what pupils are learning during the experiment; • **Final evaluation:** assess, through systematic observation, whether pupils reached the goals.
9	**Equipment and materials to be used in learning unit (tools, ingredients etc)** Bottles, ground, buds, painting colors, water
10	**Kind of setting - lab, kitchen, outdoor etc.** Indoor (Classroom)
11	**References - source:** https://www.ltl.org.uk/resources/baggardening/

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