School garden

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Scientix Learning ScEnario

Title

School garden

Author(s)

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Summary

The presence of a garden represents a natural environment in a town and has many benefits to us and to our planet. Students are encouraged to learn about plants and their presence in a garden, and understand the importance of care and responsibility in the improvement of our daily life.

Keywords

plants, garden, care, responsibility

License

Overview

Subject(s)	Biology Informatics Ethics
Topic(s)	Types of plants Creation of a garden Plant multiplication Care of a garden Benefits of gardening Our responsibility to nature and to ourselves
Age of students	13 years old
Preparation time	Biology 3 hours Ethics 1 hour
Teaching time	Biology 10,5 hours Ethics 1 hour
Online teaching material	*Kahoot,* *Socrative* tagcrowd.com
Offline teaching material	Personal computers Gardening tools Seeds
Resources used	Web pages about plants (students' choice) Video clips about plants (students' choice)

Aim of the lesson

At the end of the lesson, students will be able to:
Recognize the plants of the school garden
Take care of a garden
Multiply the plants so as to make a new garden
Make diagrams and presentations in a collaborative way
Evaluate the work of a similar team
Act responsibly
Understand the importance of living more natural and be environmentally conscious

Trends

Collaborative learning
Project-based learning
Outdoor education
Formative assessment
Bring Your Own Device
Web resources as learning materials

21st century skills

Creativity and innovation

Critical thinking and problem solving

Communication and collaboration

Information, media and technology skills

Productivity and accountability

Leadership and responsibility

STEM Strategy Criteria

Please indicate which Criteria correspond to the specific Learning Scenario, contributing on a broader scale to the development of a STEM School strategy, and briefly explain how you applied the specific Criterion: https://www.stemschoollabel.eu/criteria

Examples:

Connections with industry: in the context of this Learning Scenario, a school visit to a research centre will be scheduled, either physically or virtually, so students can directly discuss with professionals about the recent developments in the field.

Interdisciplinary instruction: in this Learning Scenario, we will examine and implement a variety of activities in a wide spectrum of subjects, ranging from ethics and philosophy (non-STEM) to biology and chemistry (STEM).

Elements and criteria	How is this criterion addressed in the learning scenario
Instruction	

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Personalization of learning	The learning activities are meaningful and relevant to learners, driven by their enthusiasm to discover new things in their personal way.
Problem and project-based learning (PBL)	Students' learning is based on working on project tasks collaboratively.
Inquiry-Based Science Education (IBSE)	Students are provided with opportunities to investigate a problem, search for possible solutions, make observations, ask questions and think creatively.
Curriculum implementation	
Emphasis on STEM topics and competencies	-
Interdisciplinary instruction	There is learning across different curricular disciplines (biology, informatics, ethics).
Contextualization of STEM teaching	Real-life applications facilitate students to understand and acquire knowledge about plants and gardens.
Assessment	
Continuous assessment	The learning scenario offers ways to assess students' progress during the lesson.
Personalized assessment	Formative assessment give the opportunity for improvement.
Professionalization of staff	
Highly qualified professionals	The school biology teacher can support the other teachers in the process of developing and enriching their STEM skills.
Existence of supporting (pedagogical) staff	-
Professional development	Teachers' knowledge, skills and effectiveness will be improved.
School leadership and culture	
School leadership	Teacher feels that he can work towards ever more effective practices as he is led by an empowered and empowering leader.
High level of cooperation among staff	-
Inclusive culture	The school environment is open and validating for all, and each person's uniqueness is valued.

Elements and criteria	How is this criterion addressed in the learning scenario
Connections	
With industry	-
With parents/guardians	In the excursion to a botanic museum or to a big garden.
With other schools and/or educational platforms	This project can be shared as good practice with other schools in several ways (collaboration between teachers, presentation in a environmental event etc)
With universities and/or research centers	Through an expert invitation.
With local communities	The staff of the botanic museum.
School infrastructure	
Access to technology and equipment	Learning is supported and enhanced with authentic, relevant use of technology (pc, projector, fast internet connection etc)
High quality instruction classroom materials	The school provides individualized resources (gardening tools, seeds etc) and technology (pc, projector etc) to enable staff to produce high-quality teaching materials.

Lesson Plan

Name of activity	Procedure	Duration
Introduction	The teacher makes a presentation to stress what the benefits are from the creation and preservation of a school garden, to our planet and to the students themselves.	15'
Previous knowledge about plants	The students answer a quiz to find out their previous knowledge about plants. A discussion follows based on the quiz results.	25'
Find the names	The students are divided into groups of 2-4 persons. Each group undertakes the responsibility to take photos of the plants that there are in a flower bed or in a part of the school garden. Then the group searches on the internet to find out the names of the plants. They are encouraged to use the Think-pair-share (TPS) collaborative learning strategy. The teacher helps them suggesting certain web sites, or giving key words (e.g. herbs)	80'

The school garden diagram	All the groups cooperate together to make a diagram of the school garden joining their project tasks. They are encouraged to use the Think-pair-share (TPS) collaborative learning strategy. The diagram gives information which plants there are and where they are in the school garden.	30'
The expert invitation	An agriculturalist is invited to school to present to the students the ways of multiplication of the plants and discuss with them about the plants.	90'
The new knowledge	The students answer a quiz relevant to the multiplication of plants in order to consolidate their knowledge. A discussion follows based on the results of the quiz.	30'
The multiplication of the plants	The groups of students search to find which way and which season the plants that belong to the flower bed or the part of the school garden they have undertaken, can be multiplied. They are encouraged to use the Think-pair-share (TPS) collaborative learning strategy. Then each group makes a presentation of the plants they are responsible for. When the proper season comes they try to create new plants, which they can then exchange between them and take them to their home in order to make their own small garden.	90'
The care of the school garden	Parallel to this, the groups of students undertake at regular intervals, the task to take care of the flower bed or the part of the garden that belongs to them, that is, to pour fertilizer, to weed, to clear the plants from dry grass and help it with watering.	90'
The excursion	An excursion is organized to a botanic museum or to a big garden in the area the school is located, with rare plants.	90'
The presentation and post of the school garden	All the groups together create a presentation or a pdf file that includes the diagram of the garden and information for each kind of plant, in order to publish it on the internet (the school website or somewhere else.). They are encouraged to use the Think-pair-share (TPS) collaborative learning strategy.	60'
The evaluation	Each team evaluates the other ones in terms of how good work each one has done in collecting and processing information, but also how well groomed the flower bed or the part of the garden that belongs to them is. They use several criteria like work quality, responsibility and contribution, but the most important will be to act responsibly.	60'
The importance of the plants	The students answer a quiz relevant to the benefits of the creation and preservation of a school garden, to our planet and to themselves. In this quiz, there is also the opportunity for students to give their opinion and evaluate the project. A discussion follows based on the results of the quiz in order to understand the importance of living more natural and be environmentally conscious.	30'

Assessment

The students are encouraged to use the Think-pair-share (TPS) collaborative learning strategy. Self- and peer-assessment, where the students evaluate themselves and one another in a group or between groups, encourages them to take greater responsibility for their learning. There is a final evaluation at which each team evaluates the other ones, in terms of work quality, responsibility and contribution. The students learn from their previous mistakes and change the perception of what is learning. In the last quiz, they evaluate the project too.

Student feedback

Student feedback is obtained at the end, in the quiz relevant to the benefits of the creation and preservation of a school garden, and the following discussion (more detailed). In the project evaluation there are questions like 'What did we learn that you loved?' or ' What was the thing that seems to be more difficult to do in this project? If all the answers to a certain question are put together in a word cloud using https://tagcrowd.com/, the teacher can see trends.

Student also give feedback through the assessment process.

Teachers' remarks

Add here your comments and evaluation **AFTER** the implementation of this lesson, if any.

About Scientix

Scientix, the community for Science Education in Europe, promotes and supports a Europe-wide collaboration among STEM (Science, Technology, Engineering and Mathematics) teachers, education researchers, policymakers and other STEM education professionals. If you need more information, check the Scientix portal, or contact either the Scientix National Contact Point or Scientix Ambassadors in your country.

Annex(es)

Add here any annex(es) for the Learning Scenario, if needed.