Inviting Pollinators to the Schoolyard

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Age 6-12

Learning Objectives

- Identify the biotic and abiotic factors necessary for insects (pollinators) to survive.
- Show how the biotic and abiotic factors contribute to plants' survival.
- Understand how pollination works and identify the importance of pollination for the preservation of biodiversity and the sustainability of ecosystems.
- Relate the life cycle of plants to the life cycle of pollinators.

Introduction Without bees, like *Apis mellifera**, the availability and diversity of fresh produce would decline substantially, and human nutrition would suffer. This lesson aims to raise students' awareness about the importance of pollinators. Use this lesson to teach students about the crucial role pollinators play in ecosystems and to human wellbeing and the threats they face. By supporting pollinators' needs, we support all biodiversity, including access to food for humans.

**Of the 20,400 species of bees in the world, more than 90% do not live in hives nor make any honey but are nevertheless effective and crucial pollinators.*

Keywords: *pollinators, bees, pollinator garden, melliferous seeds*

Structure

- Classroom Session 1 *(50 minutes)* - Importance of pollination for the preservation of biodiversity
- Classroom Session 2 *(50 minutes)* - Preparation of the flower beds
- Outdoor Session 3 *(50 minutes)* - Transplantation of the plants (schoolyard or students' homes).
- Extra session 4 (*periodic*)- Monitoring and identification of insects.

Before the Lesson

- Use the following resources to get acquainted with the activity:
  - How-to-Guide: Develop a Pollinator Plan for your school
  - Flowers Seeking Pollinators
  - Pollinators in Trouble
- Select melliferous seeds for the garden. (Consider that the melliferous plants seeds selected should have staggered flowering times.)
- Prepare a box for storing seedlings.
- Find or prepare plant substrate (fertile soil) using compost.
- Mark an ideal place for the pollinator garden on a school map. (An ideal place is one that has sun expose, but is also protected from wind).

Required Resources flower beds, plant substrate, different melliferous plants seeds or melliferous plants germinated, water.

Assessment

Use (Mentimeter, google forms, or Kahoot to get) feedback from students and track the learning process. Use seed dispersal, watering and growth charts made by students for assessment.

Dissemination

- Encourage students to document the progress of their pollinator garden with the rest of the community (article, photography, and video journalism).
- Hold a photo contest with pollinators and melliferous plants at school.
- Create an event to replicate the seeding and the planting process in the local community to create more urban gardens for insects in the balconies, home gardens.

Differentiation

Create less/more complex ways of monitoring and recording the growth of plants based on students' needs.

1 Activity

The Importance of Pollination for the Preservation of Biodiversity

Introduction

- Open the discussion with students about creating a pollinator garden by asking about pollination:
  - What do you already know?
  - Why do you think pollination is crucial for the preservation of biodiversity and sustainable ecosystems (See pollination resources)?
  - What do you want to learn more about?

Development

- Ask students to research ways to promote and protect pollinators and find some restoration activities.
- Instruct students to use laptops, tablets, and book resources to find some activities
- Ask students to record the activities down, take a screenshot, or bookmark the page to share with the rest of the class later.
- While students are researching ask them to pay attention to which plants are mentioned that are considered the most appealing to pollinators. (Ex: plants *Lavandula angustifolia* or *Rosmarinus officinalis* are attractive to the honeybee).
- Ask students to also look for information about which biotic and abiotic factors are necessary for the survival of both pollinators and plants. (Ex: light intensity or soil pH (link for more information: Abiotic factors).

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Conclusion

- Hold a session after the activity for students to reflect on their findings.
- Make a mind map of the types of plants and pollinator activities that students found the best and most interesting.

2 Activity

Preparation of the Flower Beds

Introduction

- Guide students to begin preparation for the pollinator garden.
- Explain which seeds have been chosen and why (referring to melliferous plants and students' mind map).
- Ask students to help prepare the planting stations with resources.

Development

- Instruct students to plant each seed (common box for seedlings or individual pots, plant substrate).
- Demonstrate to students that seeds should be planted about 0.5 cm deep, covered with soil, watered with warm water and then covered with polyethylene or glass to create the effect of a greenhouse to help seedlings grow (Appendix 1).
- Allow students to do the planting.

Conclusion

- Ask students to help tidy up the remaining soil, pots, etc.
- Place plants in the box for seedlings in a safe, well lit place that can easily be accessed by students for watering and observation.

3 Activity

Transplantation of the Plants

Introduction

- Have students measure the seedlings periodically.
- As soon as the plant has grown approximately 5 cm, ask students to take off the polyethylene or glass and leave the plants by an open window, to increase the time spent in the fresh air every day.
- Instruct students to look for signs that the plants are ready to be transplanted to a permanent place:
  - About 3 weeks time has passed.
  - There are at least two sets of true leaves.
  - The plant looks healthy.
  - The growing conditions and weather are suitable.

Development

- Take the box of seedlings outdoors and bring them to the predetermined permanent space.
- Have student volunteers carry the necessary gardening equipment outdoors: Shovels, twine, labels etc.
- Ask students to photograph the process to share with parents and other students later.
- If transplanting is not possible, then leave the plants wrapped in polyethylene and send them home with students.
- Have students write down transplant instructions for them to follow with their parents/ guardians at home.

Conclusion

- Hold a session after the activity for students to reflect on the process of making a pollinator garden.
- Have students draw, write, or even perform highlights from the experience.
- Create a mind map together about what the next steps could be in the pollinator garden:
  - Pollinator hotel
  - Additional flowers
  - Making a watering schedule
  - Putting rocks on sticks around the flower to protect them from being stepped on.
  - A sign to prevent people from picking them.
  - A plaque to educate the rest of the community about the importance of pollinators.

4 Activity

Monitoring and Evaluation of Pollinators

Introduction

- Review the names of various local pollinators with students.
- Ask students to suggest a good way to record sights of pollinators in the new pollinator garden.
- Agree on a chart format and display it in the classroom.

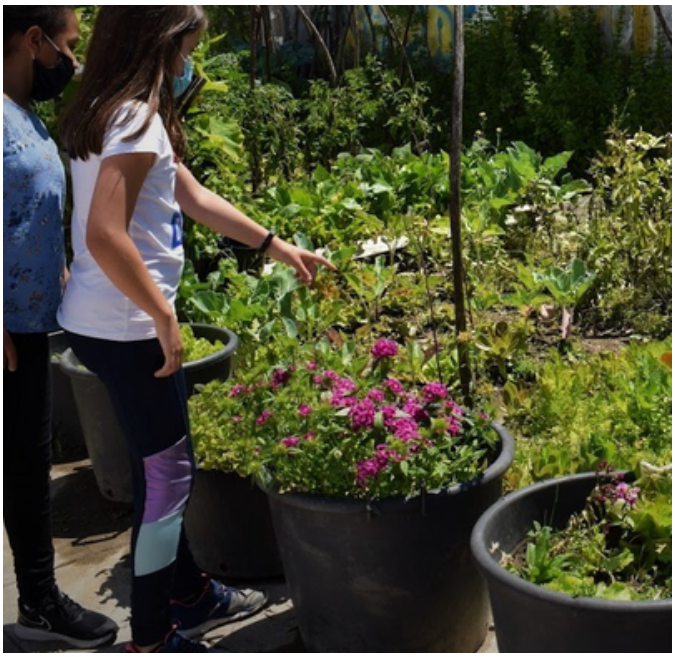
Development

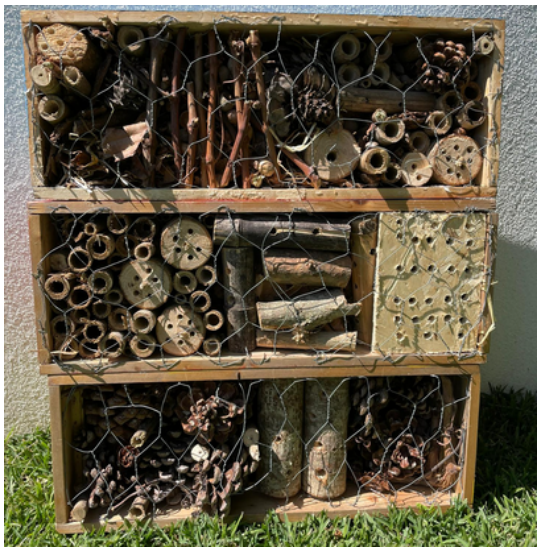
- Assign chart monitors each week at least two who are responsible for recording pollinator sightings that they or other classmates may see.
- Make sure the chart includes a way of charting the frequency and type of pollinators that have been spotted.

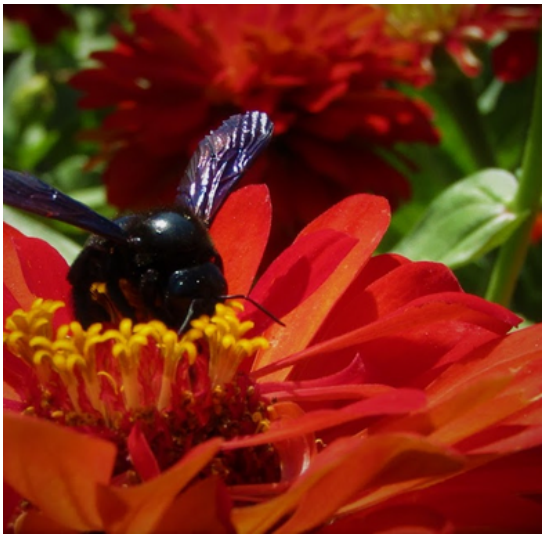
Conclusion

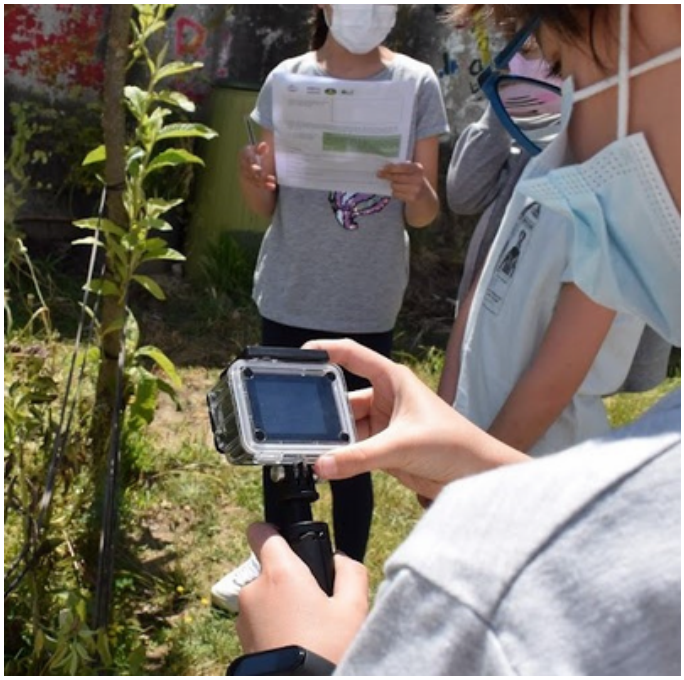
- Follow up with any suggestions students may have for improving the pollinator garden and conditions for pollinators in the local environment.

Appendix 1: Inviting Pollinators to the Schoolyard









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