



## PROTECTING GLOBAL BIODIVERSITY CAMPAIGN

#GAIA2030 #GenerationRestoration

### GAIA 20:30 Biodiversity Sub-Goals:

1. Preserving existing and creating new forests or natural areas, e.g., school gardens, parks, green neighbourhoods, etc.;
2. Promoting sustainable management of the coastal zone;
3. Combatting pollinator and insect loss;
4. Raising awareness of and supporting actions to remove invasive alien species.

### 1. AUTHOR DETAILS

a.Name/s	Vitor Martins, Maria José Araújo
b. Country	Portugal
c.Institution/School	School EB2, 3 André Soares and Science Center Centro Ciência Viva de Braga
d. Email	
e.Programmes the school is participating in (Eco-Schools/LEAF/YRE/other)	Eco-Schools and Young Reporters for the Environment
g.Would you like to receive monthly updates through our Newsletter? Yes/No	yes
h. Submission date (dd/mm/yyyy)	

## 2. THE LESSON PLAN

A. Theme – Inviting pollinators at schoolyard

B. Introduction

Without bees, like honeybee *Apis mellifera*, the availability and diversity of fresh produce would decline substantially, and human nutrition would likely suffer.

Addressing the conservation status and trends of pollinator populations, as a threat to pollinators, their relative importance and interactions, as well as impacts on nature, human well-being and the economy. Knowledge gaps about the importance of pollinators still remain in several areas and is crucial to bridge these learnings to support policymaking based on solid facts or evidence. By supporting pollinators' needs, we support our own needs for food and support diversity in the natural world.

C. Age Group: 6 - 12 years old

D. Objectives or Learning Outcomes

Students will be able to:

- Identify the biotic and abiotic factors necessary for the survival of insects;
- Identify the biotic and abiotic factors necessary for the plants;
- Understand how pollination works and identify the importance of pollination for the preservation of biodiversity and for the sustainability of ecosystems;
- Relate the life cycle of plants to the life cycle of insects;
- Relate pollination to the food needs of humans and other animal species.

E. Time required to deliver the lesson plan

- Lesson 1 (50 minutes) - Approach to the importance of pollination for the preservation of biodiversity and for the sustainability of ecosystems.
- Lesson 2 (50 minutes) - Preparation of the flower beds for the plants seeds previously selected.
- Lesson 3 (50 minutes) - Transplantation of plants to the schoolyard and students homes (for garden or balconies).
- Extra lesson - After the transplantation of plants students can do the monitoring's and identification of insects.

#### F. Remote preparation

- Choose melliferous plants seeds (honey plant),
- Collect a common box for seedlings or individual pots for flowerbeds,
- Prepare plant substrate (fertile soil) using organics compost (if is possible),
- Map of the school grounds to identify areas to take action to help pollinators. The place must be expose to the sun and protected from the wind.

#### G. Planning considerations

Teacher can take some ideas and helps in the following links: [How-to-Guide: Develop a Pollinator Plan for your school](#), [Flowers Seeking Pollinators](#), [Pollinators in Trouble](#). The melliferous plants seeds selected should have staggered flowering times.

#### H. Resources Required to deliver the lesson plan –

- Flower beds.
- Plant substrate,
- Different melliferous plants seeds or melliferous plants germinated,
- Water.

#### I. Activity:

### a. Introduction

- Discuss with students what pollination is and the importance for the preservation of biodiversity and for the sustainability of ecosystems ([Pollination resources](#));
- Students will search ways to promote and protect pollinators, and restoration habitats.
- Students will choose the plants that are more appealing for each pollination insect. For example, plants *Lavandula angustifolia* or *Rosmarinus officinalis* are attractive to the honeybee *Apis mellifera*.
- Teacher will explain the biotic and abiotic factors necessary for the survival of insects and the plants like light intensity or soil pH (link for more information: [Abiotic factors](#)).

### b. Development

- With the material collected previously, (common box for seedlings or individual pots, plant substrate) students will start to plant each seed. Seed is planted in a hole 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 (Annex 1).
- As soon as the plant is growing (approximately 5 cm), take off the polyethylene or glass and leave it by the open window, to increase the time spent in the fresh air every day.
- The last step in the growing process is transplanting the plant to a permanent previous place chosen in the school.

### c. Conclusion

The presence of thriving populations of wild pollinators is a crucial condition for having green spaces, healthy and resilient urban ecosystems. About 75% of the world's main food crops and 85% of wild plants depend on pollinators (Wilk et al, 2019). It is imperative that we take immediate steps to help pollinator populations thrive. By supporting pollinators' need for habitat, we support our own needs for food and support diversity in the natural world.

A pollinator-friendly garden can include all the things they need to survive: food, nesting sites, shelter, and a place to spend the winter (for example Insect Hotel). Even if you can, only keep a few honey plants in your garden or on your porch, these can serve as an "island of flowers", helping bees while foraging for food and flying from flower to flower island, pollinating more plants and helping the ecosystem (more information about an example of a project <https://www.kommbio.de/home/>).

#### J. Evaluation and Assessment

Mentimeter account for feedback and learning progress, Google forms, quizzes Kahoot.

#### K. Dissemination:

- Investigative reporting (article, photography, and video journalism) for young reporters for the environment.
- Photo contest with pollinators and melliferous plants at school.
- Replicate the seeding and the planting process in the local community to create more urban gardens for insects in the balconies, home gardens.

#### L. Follow-up activity: Quizzes Kahoot

#### M. Adaptations for students with learning difficulties: Not applicable.

#### N. Extension for gifted students: Not applicable.

#### O. Background information for teachers: Annex 1.

## P. References

- How-to-Guide: Develop a Pollinator Plan for your school. All-Ireland Pollinator Plan, How-toGuide 5. National Biodiversity Data Centre Series No.15, Waterford. January 2018.
- Wilk, B., Rebollo, V., Hanania, S. 2019. A guide for pollinator-friendly cities: How can spatial planners and landuse managers create favourable urban environments for pollinators? Guidance prepared by ICLEI Europe for the European Commission.
- <https://www.edutopia.org/article/bringing-natural-world-students-pollinator-garden>
- <https://news.mongabay.com/2021/11/honey-bees-find-food-more-easily-in-cities-thanks-to-abundant-urban-gardens/>
- <https://www.kommbio.de/home/>
- <https://www.nps.gov/subjects/pollinators/pollinators-in-trouble.htm>
- <https://www.nps.gov/articles/pollinator.htm>
- <https://xerces.org/pollinator-resource-center/great-lakes>
- <https://www.calacademy.org/educators/lesson-plans/flowers-seeking-pollinators>

Annex 1: Inviting pollinators to school yard- Seeding process and photo contest