MODULE VII

Lesson Plan 2

Summary

Title

Insect hotel

Duration	90 minutes
The age range of students	10-14

Summary of the theme

Insects are crucial elements for the development and sustainability of ecosystems from various points of view. Some of the reasons for this statement are pollination, which contributes to the reproduction of wild plants, the improvement of soil fertility, the ability to control pests, and even the fact that they are a source of food for other animals. It is, therefore, essential to value the existence of insects and their role in preserving the flora and fauna as we know it.
In this context, this topic deals with creating a model that allows students to learn about the wide range of insects that exist in nearby ecosystems, highlighting their role in the natural environment.

Learning outcomes

Aim/Learning Objectives.

- Introduce the concept of the ecosystem and value the importance of its preservation to contribute to the correct development of life on the planet.
- Understand the role of insects in ecosystem sustainability.

Cross-cutting objectives

Understand the large number of species that make up the animal kingdom and the importance of respecting and promoting their existence.

- Raise students' awareness of the importance of not damaging natural ecosystems.

Connecting Sustainable Development Goals

This theme is aligned with SDG 15 "Life of terrestrial ecosystems"- Target 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide essential benefits for sustainable development and 15.5 Take

urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect threatened species and prevent their extinction.

Implementation

Facilitation

- Check that you have all the necessary resources available to carry out the activity before the start of the class.
- Please note that, as a result of manual work, both the pupils and the classroom may become dirty.
- The teacher must supervise the activity involving the use of a drill.
- Create the right environment to work in.
- Coordinate students so that they are motivated to participate.

Resources / Materials needed

To carry out the activity, the following materials are needed:

- Reused plastic bags.
- Pencil.
- Rule.
- Four wooden boards approximately 10 cm x 10 cm, 1 cm thick.
- Eight N6 1 ½" wood screws.
- Electric drill.
- Two eyebolts.
- Rope.
- Folios.

Ideas to continue

You can make a nature diary to draw the insects you find and indicate their main characteristics. You can research from different bibliographic sources to discover how these insects function in nature.

Source / Classroom materials and preparation

Building an insect hotel.
https://scottishwildlifetrust.org.uk/resource/build-an-insect-hotel/?_gl=1*617dhr*_up*MQ..*_ga*OTQ0MjMyNTUuMTcyMDUzNDg1OA..*_ga_5BH0XSGV9M*MTcyMDUzNDg1Ny4xLjEuMTcyMDUzNTcxOS4wLjAuMA
How to screw into the wood with a drill:
https://www.youtube.com/shorts/nRLjRpEwKAM
List of insects to identify them:

https://www.amentsoc.org/insects/fact-files/orders/megaloptera.html

Topic outline

Time	Step-by-step instructions
20 min	Go to the school playground or a nearby green area to collect small sticks and branches on the ground. You can also collect soil or grit from the ground. Students can take advantage of the visit to observe and record the number of insects they find.
5 min	Once back in the classroom, it is time to start making the structure of the insect hotel. The first step is to mark on two of the boards the areas where the screws will be inserted. To do this, use a pencil and a ruler and respect the measurements indicated in Figure 7.2.1.
10 min	Next, you must assemble the four pieces that make up the structure of the insect hotel with the help of a drill. Start by assembling two of them, as shown in Figure 7.2.2. Make sure that one student holds piece 1 fixed and another holds piece 2 perpendicular to each other while a third performs the drilling process. An example of how to use the drill for this type of material is available in the sources section.
10 min	Continue assembling the system as shown in Figure 7.2.3. In this case, one student will be in charge of keeping boards 1 and 2 fixed and stable, another one will do it with board 3 and a third one will drill the screws.
10 min	Finish the assembly process by placing the four remaining screws. In this case, one student must make sure that boards 1, 2, and 3 are fixed, a second student must place and fix board 4, and, finally, a third student must screw in the four screws (Figure 7.2.4).
5 min	Screw two eyebolts into the top of the insect hotel and use a rope that passes through both of them. This rope will be used to hang the structure in a tree at a later date (Figure 7.2.5).
10 min	Pour the soil on the inside surface of the insect hotel and then place the collected branches inside.
5 min	Go to the school playground or a nearby green area to hang the structure on a tree.
15 min	After one week, visit the structure. Observe the insects found and fill in Table 7.2.2.

Formative evaluation

Classroom observations.

- Description: Teachers observe students during the elaboration of the activities.
- Objective: To assess students' understanding level and ability to apply the knowledge acquired in a practical activity.
- The following evaluation table is proposed:

Criterion	Excellent (5)	Very Good (4)	Good (3)	Adequate (2)	Insufficient (1)
Understanding Concepts	Demonstrates a full and thorough understanding of the activity, explaining clearly and accurately.	Shows a good understanding, with some advanced ideas or applied examples.	Understands basic concepts, with generally correct explanations.	Has a basic understanding but needs clarification on several points.	Shows little understanding of concepts, with significant errors.
Practical Skills	Performs prototype construction accurately and creatively, with attention to detail and without errors.	Completes the task accurately, making minimal errors that do not affect performance.	Completes most of the steps correctly, with some minor errors.	Complete assembly with significant but functional errors.	Presents considerable difficulties, with an end product that does not meet basic requirements.
Teamwork	Collaborates exceptionally, leading, motivating, and actively helping others.	Collaborates effectively, contributing consistently and supporting colleagues.	Participates appropriately, with useful contributions and general cooperation.	Participates on a limited basis, with occasional contributions and need for guidance.	Minimal or negative participation, with little or no contribution to the team.
Active Participation	Participates actively in all activities and discussions, showing enthusiasm and curiosity.	Participates regularly, with interest and commitment evident in most activities.	Participates adequately, although with less enthusiasm or frequency.	Participates only when asked, showing little interest or commitment.	Participates rarely or not at all, showing obvious disinterest in the activity.
Reflection and Evaluation	Offers in-depth and critical reflections, clearly identifying lessons learned and areas for improvement.	Provides detailed reflections, with some critical ideas and suggestions for improvement.	Reflects on the process and outcomes with a general understanding.	Reflects superficially, with few clear ideas for improvement.	Does not provide meaningful reflections or shows a lack of understanding of the process and outcomes.

Table 7.2.1 Evaluation table

Feedback

Net Promoter Score (NPS) is a widely used tool to measure the loyalty and satisfaction of customers or, in an educational context, students. It measures the likelihood that students will recommend the subject or course to others.
How to analyse and apply NPS is explained below:

Development of the NPS question:

- Main question: "On a scale of 0 to 10, how likely are you to recommend this topic to other students?
- Follow-up questions: "Why did you select this score?" and "How can we improve this issue?

Collection of responses:

- Digital surveys: Use online tools such as Google Forms, SurveyMonkey, or Typeform to collect student responses.
- Paper surveys: Paper questionnaires are handed out at the end of the lesson for students to complete. A template for collecting responses with paper surveys is shown in the Annex.
- Interactive applications: Interactive applications such as Quizziz, Mentimeter, or Kahoot! are used to collect answers in real-time.

Classification of responses:

- Promoters (Score 9-10): Students are very satisfied and likely to recommend the subject.
- Passive (score 7-8): Satisfied, but not enthusiastic students; they could easily change their minds.
- Detractors (Score 0-6): Dissatisfied students who are unlikely to recommend the subject; they could provide constructive criticism.

Calculation of NPS:

- Formula: NPS = % of promoters - % of detractors.
- Score interpretation: NPS ranges from -100 to +100. A positive score (above 0) is generally good, and a score above 50 is excellent.

Analysing and using comments:

- Review the comments to understand the reasons behind the scores.
- Identifies patterns and specific areas for improvement among detractors and passives.
- Use the promoters' positive comments to reinforce the positive aspects of the issue.

Annexes

This Annex shows the Figures that represent the development of the proposed activity.

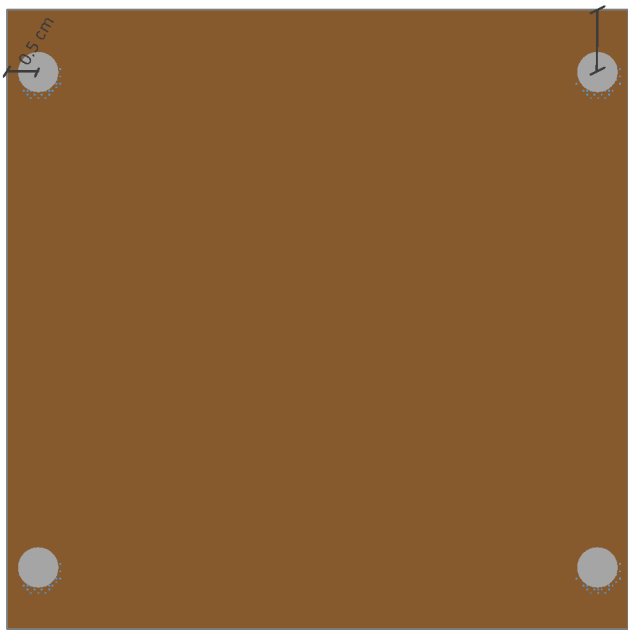


Figure 7.2.1 Marking of the points where the screws will be placed

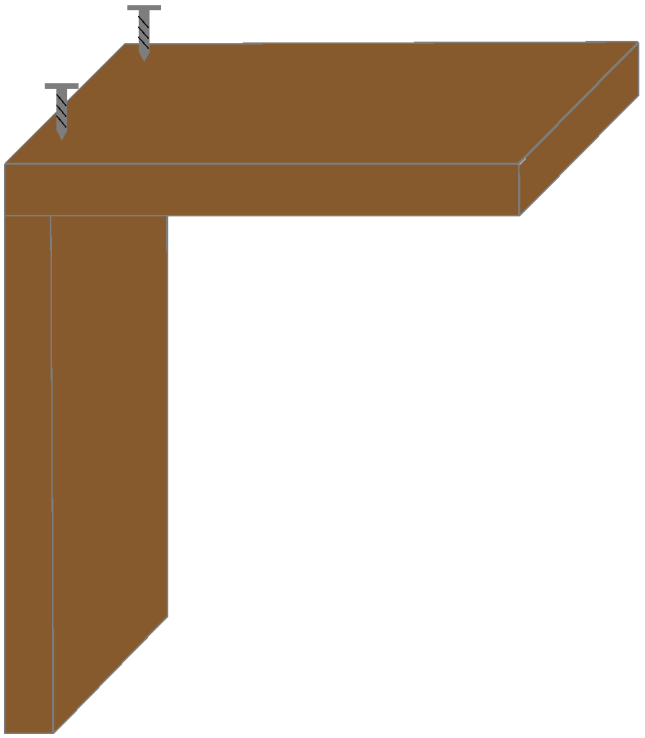


Figure 7.2.2 Placement of the first two screws to assemble boards 1 and 2

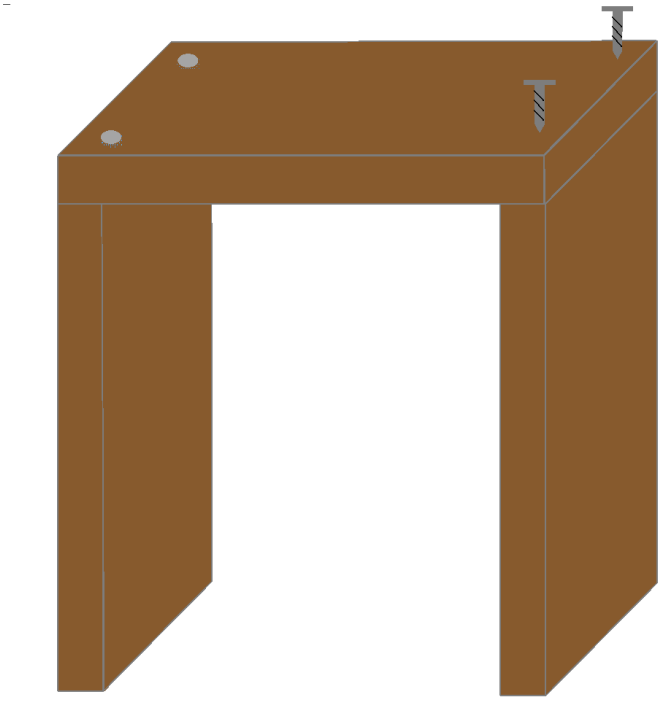


Figure 7.2.3 Placing the screws to assemble boards 1, 2 and 3

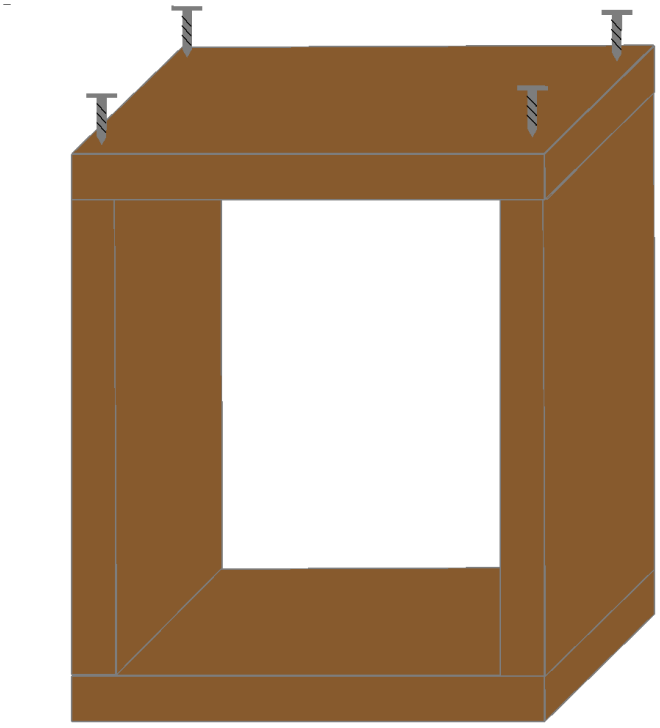


Figure 7.2.4 Placing the screws to assemble boards 1, 2, 3 and 4

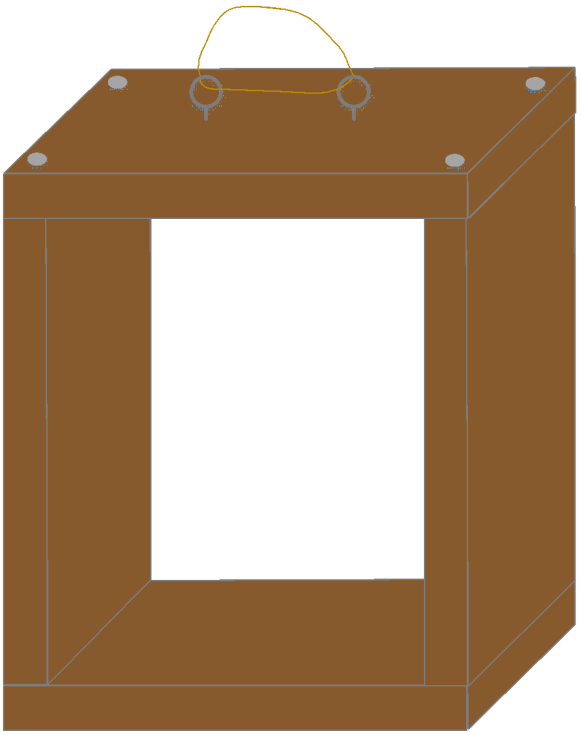


Figure 7.2.5 Placement of eyebolts and hanging rope

Type of insect	Approximate number of insects

Table 7.2.1 - Information to be collected after one week of insect adaptation

QUESTIONNAIRE TO COLLECT FEEDBACK ON THE TOPIC

On a scale of 0 to 10, how likely would you recommend this subject to other students?

0	1	2	3	4	5	6	7	8	9	10

Not likely at all Extremely likely

Why did you choose that score?

How could this issue be improved?