E- module 4: Ecological fight against plant pests and diseases (3º Primaria)

Objectives

• Students will be able to identify common plant pests and diseases. • Students will learn about ecological methods for pest and disease control. • Students will understand how artificial intelligence can be used in plant protection.
• Students will develop critical thinking and problem-solving skills.

Materials

• Whiteboard or projector
• Markers or pens
• Images of common plant pests and diseases
• Samples of natural pest control methods (e.g., ladybugs, neem oil) • Computer or tablet with internet access
• AI-based plant identification app (e.g., Plantix, PictureThis)

Lesson Plan 1: Introduction

- Begin with a class discussion about the importance of plants and the challenges they face from pests and diseases.
- Show images of common plant pests and diseases, and ask students to identify them.
- Introduce the concept of ecological pest and disease control as a way to protect plants without harming the environment.

Lesson Plan 2: Ecological Methods

- Discuss various ecological methods for pest and disease control, such as:
  - Companion planting: Planting certain plants together to repel pests or attract beneficial insects.
  - Biological control: Using natural enemies of pests, such as ladybugs or parasitic wasps.
  - Neem oil: A natural pesticide extracted from the neem tree.
  - Crop rotation: Rotating different crops to prevent the buildup of pests and diseases.

Lesson Plan 3: Hands-on Activity: Natural Pest Control

- Divide students into small groups and provide each group with a sample of a natural pest control method (e.g., ladybugs, neem oil). ○ Ask students to research their assigned method and create a presentation or poster to share with the class.

Lesson Plan 4: Introduction to AI in Plant Protection

- Explain how artificial intelligence can be used to identify plant pests and diseases more quickly and accurately than humans.
- Introduce an AI-based plant identification app (e.g., Plantix, PictureThis) and demonstrate how it works.
- Discuss the potential benefits and limitations of using AI in plant protection.

Lesson Plan 5: AI Challenge: Plant Diagnosis

- Have students use the AI-based plant identification app to diagnose a plant with a pest or disease.
- Ask students to research the recommended treatment for the diagnosed problem and present their findings to the class.

Assessment

• Observe students' participation in class discussions and activities. • Evaluate students' presentations or posters on natural pest control methods. • Assess students' ability to use the AI-based plant identification app to diagnose plant problems.

Extension Activities

- • Visit a local garden or farm to learn about their pest and disease control practices.
- • Conduct a class experiment to compare the effectiveness of different ecological pest control methods.
- • Research and present on other applications of artificial intelligence in agriculture.

E- module 5: Use of local resources for an ecological agriculture

(4º Primaria)

Objectives

- Students will be able to identify local resources that can be used in an ecological greenhouse.
- Students will understand the benefits of using local resources for sustainability. • Students will learn how AI can assist in optimizing resource use in a greenhouse.

Materials

- Whiteboard or projector
- Markers or pens
- Handouts with local resource examples (e.g., types of soil, compost, natural pest control)
- Internet access for AI tools
- Optional: samples of local resources

Lesson Plan 1: Introduction

- Begin with a class discussion: "What are some things plants need to grow?" (water, sunlight, nutrients, etc.)
- Introduce the concept of an ecological greenhouse: "A greenhouse where we try to use resources that are good for the environment and are found locally."

Lesson Plan 2: Brainstorming Local Resources

- Divide students into small groups.
- Ask each group to brainstorm local resources that could be used in a greenhouse. • Have each group share their ideas with the class.
- Discuss the benefits of using local resources (reduces transportation costs, supports local economy, may be better suited to the environment).

Lesson Plan 3: AI-Powered Resource Analysis

- Introduce an AI tool (e.g., a chatbot or website) that can provide information on local resources.
- Have students use the AI tool to research specific local resources. For example: • "What type of soil is best for growing tomatoes in our area?"
- "What are some natural ways to control pests in a greenhouse without using chemicals?"
- Discuss the information provided by the AI and how it can help make decisions about resource use.

Lesson Plan 4: Greenhouse Design Challenge

- Divide students into teams.
- Challenge each team to design a model greenhouse using only local resources. • Have each team present their design and explain their resource choices.

Lesson Plan 5: Reflection and Wrap-up

- Review the key concepts of the lesson.
- Discuss how AI can be a valuable tool for sustainable agriculture.
- Ask students to reflect on what they learned about local resources and ecological greenhouses.

Assessment

- Observe student participation in discussions and activities.
- Review student research using the AI tool.
- Evaluate the greenhouse designs created by the teams.

Extension Activities

- Visit a local greenhouse.
- Start a class greenhouse using local resources.
- Research careers in sustainable agriculture and AI.

AI Tools

- Consider using Google's Bard or a similar AI chatbot that can provide information on local resources and answer student questions.
- Explore AI-powered greenhouse management systems that can optimize resource use based on real-time data.