Lesson Title: What is Integrated Pest Management (IPM?)

Grade Level: 9-12

Subject Area: Horticulture

Duration: *100 minutes, over two to three class periods*

Standards Addressed: CTE Agriculture and Natural Resource Standards C2.1, C12.2, C12.3, F4.4, G5.4

Activity/Lesson Objectives:

- Students will identify and provide examples of each of the five IPM methods.
- Students will evaluate scenarios to determine the most appropriate IPM methodology.
- Students will explain why IPM is a preferred management strategy.

Engagement Activity: Plant Problems (20 minutes)

Materials:

- A real plant with a visible problem (if available)
- Alternative: High-quality images of the plant, its surroundings, and the issue (from multiple angles if possible)
- Access to the UC IPM website (optional for research)
- Optional: "Plant Problem Diagnosis Checklist" from the *Retail Garden Center Manual*, published by the University of California

Procedure:

1. Begin by presenting the scenario: *"Imagine you're in the nursery and notice that all the plants in the back area have this issue. What do you do?"*
2. Facilitate a discussion with the students, encouraging them to share their thoughts on what they think the problem might be and why it could pose an issue.
3. Introduce students to the UC IPM website and show them how to search for information related to plant problems. Highlight how to use the search engine, browse by plant type or pest, and find recommended management strategies.
4. Conclude the activity by discussing the students' findings and connecting their observations to potential solutions or management strategies.
5. Optional: Give students the "Plant Problem Diagnosis Checklist" (page 122 of the *Retail Garden Center Manual*) and demonstrate how to use the checklist to determine what might be wrong with a plant.

Explore: California's Most Wanted Pests (30 minutes)

Materials:

- Poster paper
- Markers or colored pencils

Guiding Questions:

- What activities do “good” insects perform?
- What activities do “bad” insects perform?
- Why are certain activities considered harmful?
- Why are certain activities considered beneficial or important?

Procedure:

1. Begin by introducing the topic: *“There are many challenges that nursery professionals and homeowners face when growing plants, from insect pests to pathogens to soil-related issues. For this activity, we’ll focus on insects. As you work, consider why the actions of some insects are harmful and why others are beneficial.”*
2. Assign students to create a wanted poster featuring two beneficial insects and two invasive pests.
    - For invasive pests, include the name, a description, and their “criminal actions” (harmful activities).
    - For beneficial insects, include the name, a description, and their “beneficial actions” (helpful activities).
3. Offer students examples of common insects native to your region for inspiration.
4. Once posters are completed, facilitate a class discussion where students share their work, highlighting the differences between harmful and beneficial insect activities.

Explain: Integrated Pest Management (IPM) Presentation (25 minutes)

Materials:

- What is Integrated Pest Management (IPM)? Google Slides Presentation
- What is Integrated Pest Management (IPM)? Guided Notes

Procedure:

1. Begin by reviewing the slideshow and ensuring familiarity with the content. Hand out the guided notes to each student.
2. As you present each slide, pause periodically to allow students to fill in their guided notes. Highlight key points, provide additional context, and encourage student interaction by asking questions or prompting discussion.
3. At the end of the slideshow, review the key concepts covered in the presentation. Go over the notes with the class, ensuring that students have accurately filled in their guided notes.

Evaluate: Problem-Solving Real Customer Issues (25 minutes)

Materials:

- Ask the Plant Doctor Handout
- Laptop or tablet (optional for research)
- Access to the UC IPM website (optional for research)
- Activity assessment rubric

Procedure:

1. First, introduce the activity: *"Today, you'll act as 'Plant Doctors.' Each group will diagnose two plant problems—one from an insect pest and one from a non-insect issue, like disease or nutrient deficiency. Just like nursery pros, you'll need to figure out what's going on and recommend solutions. Use the UC IPM website to research and support your recommendations. Let's see what mysteries you can uncover!"*
2. Divide the class into small groups. Give each group one page of the handout, which includes two plant problem scenarios—one insect-related and one non-insect-related.
3. For each scenario, groups should:
    - Examine the photo and read the customer's description carefully.
    - Use their prior knowledge and the UC IPM website to diagnose the likely cause of the problem.
    - Recommend at least three specific actions a homeowner could take to address the issue.
4. Walk around the room as groups work. Answer questions, offer guidance, and encourage thoughtful analysis and practical solutions.
5. After about 10 minutes, have each group present their diagnoses and recommendations to the class. Ask them to explain their reasoning and how they used available resources to reach their conclusions.

Criteria for Success:
Evaluate each group using the activity assessment rubric.

	0-1 Needs Improvement	2-4 Developing	5 Proficient
Criteria 1: Diagnosis	No diagnosis provided, or diagnosis is incorrect.	Diagnosis is somewhat accurate but lacks specificity (e.g., general pest category, not exact pest or issue).	Provides a correct and specific diagnosis of the exact pest or cause.
Criteria 2: Recommendation	Provides fewer than three recommendations, or none at all.	Provides three recommendations, but some are vague, impractical,	Provides three clear, accurate, and appropriate recommendations

	0-1 Needs Improvement	2-4 Developing	5 Proficient
Criteria 1: Diagnosis	No diagnosis provided, or diagnosis is incorrect.	Diagnosis is somewhat accurate but lacks specificity (e.g., general pest category, not exact pest or issue).	Provides a correct and specific diagnosis of the exact pest or cause.
		or not fully accurate.	for addressing the problem.

Conclude the activity with a brief discussion about the importance of accurate diagnosis and problem-solving in nursery work, and how these skills help professionals guide customers through plant issues using Integrated Pest Management (IPM) principles. Use the following questions to prompt discussion:

- Why is it important to correctly identify the exact cause of a plant problem before recommending a treatment, especially when using IPM?
- How does IPM encourage nursery professionals to think beyond just using pesticides when solving plant health issues?
- What are some benefits of using IPM strategies—for both the environment and the customer—when managing plant problems?