



## The Impact of Pesticides on the Ecosystem

Time: 2-3 Days

Grade Level: 8

**Purpose:** 8th Grade Ethnic Studies Science scholars will learn about invertebrates like bees and how they cannot detect which flowers have been contaminated with toxins. They will learn that pesticides can affect the health of bees and their colony. They will then connect this with the impacts and work of the United Farm Workers and agricultural workers.

### **Unit Enduring Understandings Alignment: Systems**

- We understand and challenge all forms of oppression and their manifestations by conceptualizing and enacting transformative projects of agency and resistance.
- We understand that while studying forms of oppression, it is also critical to engage ourselves in developing critical consciousness, reclaiming hope and healing.

### **Lesson Guiding Questions:**

- Should pesticides be banned? Why?
- If pesticides are harmful to bees, who else can they harm?
- Who is exposed to pesticides in the fields?
- What solutions could be implemented?

### **Cultural Wealth (Yosso, p. 78):**

- 5. Navigational capital refers to “skills of maneuvering through social institutions. Historically, this implies the ability to maneuver through institutions not created with Communities of Color in mind.
- 6. Resistant capital refers to “those knowledges and skills fostered through oppositional behavior that challenges inequality... This form of cultural wealth is grounded in the legacy of resistance to subordination exhibited by Communities of Color... Furthermore,

maintaining and passing on the multiple dimensions of community cultural wealth is also part of the knowledge base of resistant capital”

**Ethnic Studies Principles Alignment:**

- Cultivate empathy, community actualization, cultural perpetuity, self-worth, self-determination, and the holistic well-being of all participants, especially Native peoples and people of color.
- Conceptualize, imagine, and build new possibilities for post-imperial life that promotes collective narratives of transformative resistance, critical hope, and radical healing

**Standards Alignment:**

**Students who demonstrate understanding can:**

- MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]
- MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.\* [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]

**Materials:**

[Lesson Slides](#)  
[Times Magazine Slides](#) written by Natasha Arroyo  
[Book Creator Platform](#)  
[Canva Platform](#)  
[Sound Trap Platform](#)

**Modifications, Accommodations, Resources for Multilingual Students :**

- Translanguaging strategies as appropriate.
- Use of multiple visuals are built into the lesson plan.
- Apply modifications and accommodations as mandated.

## C1: Cultural Rituals and Energizer

STEP	DESCRIPTION	TIME
Step 1	<b>Land Acknowledgement: Repeat newly created land acknowledgement each day.</b>	<b>4 min</b>
Step 2	<b>Ancestor Acknowledgement: Repeat newly created ancestor acknowledgement each day.</b>	<b>10 min</b>
Step 3	<b>Cultural Energizer: Isang Bagsak</b>	<b>5 min</b>
Step 4	<p><b>Cultural Energizer: Flowers For The Bees</b></p> <p><b>INSTRUCTIONS</b></p> <ol style="list-style-type: none"> <li>1. Scatter the student made 'flowers' across an area of grass.</li> <li>2. Divide the class into two groups, each has a queen honey bee and the worker honey bees compete to find flowers.</li> <li>3. The team that gathers the most flowers in two minutes wins.</li> <li>4. The flowers are tallied by the two queen bees. When tallying, note how many flowers have marks on them. These flowers are tainted with pesticides. High levels of pesticides can be fatal, while low levels can cause behavioral change.</li> <li>5. Each student with a contaminated flower can either spin around three times so that their coordination and foraging behavior is impaired, or they can forage in slow motion.</li> <li>6. Now spend another two minutes gathering flowers that have been redistributed. The worker bees who have contaminated flowers should have impaired movement.</li> <li>7. When tallying, note if any students have gathered contaminated flowers in both rounds. These bees are not healthy as toxins have accumulated in their system.</li> <li>8. Count the total flowers for each hive.</li> </ol>	<b>30 min</b>

	<ul style="list-style-type: none"> <li>• Which hive has gathered the most? They can make the most honey.</li> <li>• Which colony has visited the fewest pesticide infected flowers? This is the healthiest colony.</li> </ul>	
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**C2: Critical Concepts**

	DESCRIPTION	TIME
	<p><b>WHAT ARE NEONICOTINOIDS?</b> Neonicotinoids are one of the world’s most popular pesticides and are now almost completely banned in many countries because of the threat they pose to pollinators. They are a group of systemic insecticides similar in chemical structure to nicotine. Systemic means that the chemicals are taken up by plants and transported to all the tissues and in turn transferred to the pollen and nectar, where they can be eaten by pollinators.</p> <p><b>EFFECTS ON POLLINATORS</b> In recent years, studies have shown that neonicotinoids can have lethal effects on pollinator species by direct contact or ingestion. In addition, research has revealed that they could lead to other harmful effects, such as disrupting foraging behavior, homing ability, communication and the development of larvae. There is evidence to suggest that exposure to low doses can also damage the immune system of bees.</p> <p><b>CLASS DISCUSSIONS</b></p> <p>Should pesticides be banned? Why? If pesticides are harmful to bees, who else can they harm? Who is exposed to pesticides in the fields? What solutions could be implemented?</p>	<p><b>15 min</b></p>

**C3: Community Collaboration and/or Critical Cultural Production**

STEP	DESCRIPTION	TIME
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	<p><b>Community Collaboration: How do humans impact our Ecosystem?</b></p> <p>Click on Time Magazine Slides Link to open the magazine created by Natasha Arroyo. <a href="#">LINK</a></p>				
	<p>In groups of 4, you will all research different slides in the Magazine Presentation assigned to you. After you have documented key concepts in the graphic organizer below, you will share with your group your findings. Fill in your organizer with your group’s information.</p> <table border="1" style="width: 100%; height: 150px;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Civil Rights Legacy</b> <small>(slides 3-5)</small></p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Farm Workers and Pesticides</b> <small>(slides 7-9)</small></p> </td> </tr> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Negative Effects of Agriculture on the Environment</b> <small>(slides 10-11)</small></p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Farm Workers Today</b> <small>(slides 12-13)</small></p> </td> </tr> </table>	<p><b>Civil Rights Legacy</b> <small>(slides 3-5)</small></p>	<p><b>Farm Workers and Pesticides</b> <small>(slides 7-9)</small></p>	<p><b>Negative Effects of Agriculture on the Environment</b> <small>(slides 10-11)</small></p>	<p><b>Farm Workers Today</b> <small>(slides 12-13)</small></p>
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	<p><b>Cultural Production: Presentations</b></p> <p>Students have a choice between three platforms to create their cultural production on.</p> <p><a href="#">Book Creator Platform</a></p> <p><a href="#">Canva Platform</a></p> <p><a href="#">Sound Trap Platform</a></p>				
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<b>Connection:</b> How is this relevant to students? How is it relevant to the unit? How do you bring back to the PURPOSE of the unit?	The community circle allows students to reflect on their new understandings of pesticides, the ecosystem and agricultural workers.
<b>Assessment:</b> How will the students be assessed?	Students will be assessed by their participation in the cultural production and demonstration of their understanding of the effects of pesticides on the ecosystem.
<b>Evaluation:</b> How will the effectiveness of this lesson plan be evaluated?	It will be evaluated by student engagement and learning.

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Lesson Plan Contributors: Natasha Arroyo and Lupe Carrasco Cardona