

Lesson: The Million Dollar Fly

Grade Level: 3rd-5th grade, (Environmental Literacy) focus on 5th grade

Overview: Students will learn about the term *invasive* and *engangered* species. Students will learn about The Spotted Lanternfly, an invasive species that is destroying Pennsylvania's agriculture and ecosystem. The class will gain knowledge on the negative impacts this species has caused to Pennsylvania agriculture in grapes, apples, and the hardwood industries. Students will also learn why it is crucial for STEM-related careers in agriculture to create solutions to control this state environmental issue. Students will study and design "Wanted Bug" flyers to promote awareness to the community. Students will also plant milkweed within their community as a natural way to control the spread of the Spotted Lanternfly and promote growth with the endangered species, the Monarch Butterfly. Students will see the importance of having a balanced ecosystem.

Science Content:

Earth and Space Sciences- Earth and Human Activity

Environmental Literacy and Sustainability- Environmental Literacy

Science standards:

Pennsylvania Science State Standards Grade Pre K-5

5-ESS3-2: Generate and design possible solutions to a current environmental issue, threat, or concern.

3-5ELS2-4: Develop a model to demonstrate how local environmental issues are connected to the larger local environment and human systems.

Science Practices:

APPENDIX F – Science and Engineering Practices in the NGSS www.nextgenscience.org

Practice 1 Asking Questions and Defining Problems

- Ask questions about what would happen if a variable is changed.
- Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
- Use prior knowledge to describe problems that can be solved.
- Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.

Practice 3 Planning and Carrying Out Investigations

- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- Make predictions about what would happen if a variable changes.

ELA Standards:

PENNSYLVANIA CORE STANDARDS English Language Arts Grade Pre K–5

<https://www.education.pa.gov/Teachers%20-%20Administrators/Curriculum/ELA/Pages/default.aspx>

CC.1.4.3.C: Develop the topic with facts, definitions, details, and illustrations, as appropriate.

CC.1.2.4.E: Use text structure to interpret information (e.g., chronology, comparison, cause/effect, problem/solution).

CC.1.4.5.C: Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic; include illustrations and multimedia when useful to aiding comprehension.

ELA Practices:

PENNSYLVANIA CORE STANDARDS English Language Arts Grade Pre K–5

Standard 4: Writing develops the skills of informational, argumentative, and narrative writing, as well as the ability to engage in evidence based analysis of text and research.

ELA Content:

Informative & Explanatory: 1.4 Writing Students write for different purposes and audiences. Students write clear and focused text to convey a well-defined perspective and appropriate content.

Craft And Structure, Text Structure: 1.2 Reading Informational Text Students read, understand, and respond to informational text—with an emphasis on comprehension, vocabulary acquisition, and making connections among ideas and between texts with a focus on textual evidence.

Science & ELA Connection:

Relationships and Convergences Found in the Common Core State Standards in Mathematics (practices), Common Core State Standards in ELA/Literacy*(student portraits), and A Framework for K-12 Science Education (science & engineering practices) Venn Diagram NSTA Science, Math, & ELA
<https://static.nsta.org/ngss/PracticesVennDiagram.pdf>

- **E2.** Build a strong base of knowledge through content rich texts
- **E5.** Read, write, and speak grounded in evidence
- **M3 and E4.** Construct viable arguments & critique reasoning of others
- **S7.** Engage in argument from evidence

Materials:

- Pencil and colored pencils/markers
- Pennsylvania's Most Unwanted Poster Activity PDF,
https://www.canva.com/design/DAFNbZyUgyQ/_rr7IYGzYAskVBtfPKIsdw/edit?utm_content=DAFNbZyUgyQ&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton
- Milkweed Seed

Resources:

- Student reading resources:
 - Invasive Species, Hunger Pests, USDA,
<https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/the-threat/spotted-lanternfly/spotted-lanternfly>
 - Spotted LanternFly Debunk Myths, farms.com
<https://www.farms.com/news/spotted-lanternfly-experts-debunk-myths-about-the-prodigious-pestilent-pest-164065.aspx>
- Student video resource:
 - What is a Spotted Lantern Fly? Penn State Extension Video,
<https://youtu.be/uin0GECoi4A>

- Cause and Effect Pdf
- Pennsylvania's Most Wanted worksheet
- Read a-loud resource, "Science Warriors: The Battle Against Invasive Species (Scientists in the Field Series)" by Sneed B. Collard III
https://www.amazon.com/gp/product/0618756361/ref=ox_sc_act_image_1?smid=A25H6JFKDMQ758&psc=1
- Teacher reading resource-
 - CNN, Spotted Lanterflies are thriving
<https://us.cnn.com/2022/09/24/us/spotted-lanternfly-habitat-expanding-climate/index.html>

Learning Objectives:

- Students will learn about the invasive species, The Spotted Lantern Fly.
- Students will learn about cause and effect to the environment.
- Students will create and design a UnWanted Poster to show knowledge of the cause and effect of this species.
- Students will learn about solutions to this current environmental problem.
- Students will plant milkweed to decline the spread of Spotted Lantern Flies and help increase the endangered species the Monarch Butterfly.

Procedure:

- Students will learn about the invasive species, The Spotted Lantern Fly. Students will use the following reading articles from the resource selection.
- Students will then watch and discuss the Penn State Extension short video about this species.
- Students will create an UnWanted Poster for the Spotted Lantern Fly using colored pencils and/or markers.
- The teacher will guide students with a read aloud, "Science Warriors: The Battle Against Invasive Species (Scientists in the Field Series)" by Sneed B. Collard III
- Then the teacher will guide students into filling out the Cause and Effect worksheet.
- Students will then read, "Spotted LanternFly Debunk Myths" By: farms.com
- Finally, students will take an active solution by planting Milkweed seeds to decrease the invasive species, Spotted Lantern Fly problem and promote Monarch Butterfly growth, the endangered species.