

Problem-Based Learning Unit Template

Topic

SOL 4.4 Plant Life Plants, Photosynthesis, and Pollinators

Goals/Objectives

- 4.4 The student will investigate and understand basic plant anatomy and life processes. Key concepts include
- the structures of typical plants and the function of each structure;
 - processes and structures involved with plant reproduction;
 - photosynthesis; and
 - adaptations allow plants to satisfy life needs and respond to the environment.

In order to meet this standard, it is expected that students will

- analyze a common plant: identify the roots, stems, leaves, and flowers, and explain the function of each.
- create a model/diagram illustrating the parts of a flower and its reproductive processes. Explain the model/diagram using the following terminology: pollination, stamen, stigma, pistil, sepal, embryo, spore, seed.
- compare and contrast different ways plants are pollinated.
- explain that ferns and mosses reproduce with spores rather than seeds.
- explain the process of photosynthesis, using the following terminology: sunlight, chlorophyll, water, carbon dioxide, oxygen, and sugar.
- explain the role of adaptations of common plants to include dormancy, response to light, and response to moisture.

Theme

Why are plants important to humans and the environment?

Scenario

Students will be presented with the following mock article:

SCIENCE WEEKLY: Vanishing of the Bees

The plight of the Western Honeybee remains a source of concern for scientists as colonies continue to collapse. While efforts to rebuild colonies of these valuable pollinators have increased, the cause of the initial collapse remains a subject of debate in the scientific

community.

According to apiologist Dr. Genevieve Weatherby, there are several factors that contribute to Colony Collapse Disorder (CCD). "On the one hand, there are certain fungal infections to which bees are and always have been susceptible. It's natural to see some colony loss, but not as much as we've seen in recent years," Weatherby reports. "The larger concern when it comes to CCD is the use of certain pesticides and fungicides. While the amounts used are not always directly fatal, these substances often leave the bees' immune systems vulnerable to parasites that, unfortunately, are."

For more information or see what you can do to help, you can contact Dr. Weatherby and her team at weatherby.ge.apiarysciences@gmail.com

Materials:

Mock newspaper article

Actual newspaper and internet articles

Vanishing of the Bees documentary

Culminating Activity

Students will create presentations to be "sent" to Dr. Weatherby's apiary team to help convince others to preserve bee populations and hives. One group will create a presentation to show how loss of pollinators/plants will affect resources. Another group will complete a presentation showing the effects on food sources. The last group will make a presentation to demonstrate how loss of pollinators/plants will affect oxygen supply. Students will work together design and build models of bee-friendly gardens which will be presented to the school principal and student peers. The chosen garden design will be used to plant a bee-friendly garden which houses a beekeeping hive box.

Problem Question

How will humans be affected by Colony Collapse Disorder and a decline in plant life?

Student Role

Students will complete research, activities, and projects that will help them better understand the function of plants and pollinators. These activities will also help them understand the possible effects of losing our pollinators and plants. Students will then complete presentations that will be "sent" to Dr. Weatherby which will help persuade others to save bees and, subsequently, our plant populations. Students will work together design and build models of bee-friendly gardens which will be presented to the school principal and student peers. The chosen garden design will be used to plant a bee-friendly garden which houses a beekeeping hive box.



VISTA



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