

Plant Blindness

High School Lessons

Introduction to Biodiversity

Ayesha T. Qazi

AP Environmental Science (11th-12th grade)
Unit 2: The Living World: Biodiversity



Lessons Description

The tendency to not notice or appreciate diversity of plants around us is defined as Plant Blindness. In these series of lessons students will engage in activities, modules, and labs related to Plant Blindness while covering topics within biodiversity.

Driving Phenomenon

How do we interact with plants everyday?
How do we depend on plants?
What services to plants provide?

Big Idea

Interactions Between Earth Systems

Alignment to AP Environmental Science Curriculum:

- Unit 2: The Living World: Introduction to Biodiversity
- 2.1: Introduction to Biodiversity
 - 2.2: Ecosystem Services

Teacher Resources

- Image I, II, III
- Activity I
- Flagellate Plant Groups WebQuest
- GoFlag Video
- Morphology Module
- Tree Thinking Activity
- Phylogenetic Tree Kahoot
- Rubric

Learning Objectives

- Distinguish between the abiotic and biotic factors in an ecosystem
- Differentiate between a species, population, community, and ecosystem
- Explain levels of biodiversity and their importance to ecosystems
- describe ecosystem services
- describe the results of human disruptions to ecosystem services
- distinguish between the background rate of extinction (natural rate of extinction) and the current accelerated rate due to human impact.

Time Requirements

- The Engage, Explore, Elaborate, Explain, and Evaluate part of the lesson can be taught within 4-5 class days (depending on 50 min to 100 min classes)

Essential Knowledge

- Biodiversity in an ecosystem includes genetic, species, and habitat diversity
- The more genetically diverse a population is, the better it can respond to environmental stressors. Additionally, a population bottleneck can lead to a loss of genetic diversity.
- ecosystems that have a large number of species are more likely to recover from disruptions

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Engage | Day 1: A Walk though the Field

Notes

- Abiotic vs Biotic Factors in nature
- Ask students among the biotic factors listed, how many wrote down an example of a tree? birds? flowers? grass? moss? lichens? liverworts? bryophytes? lycophytes? hornworts?
- Introduce the term **Plant Blindness** to students.

If accessibility to a public green space is an issue, students can use Google Maps (satellite view) to observe school neighborhood

Explore | Day 2: Introduction to Flagellate Plants + Collecting & Preparing Specimens

Notes

- Share **Image I, II, III** & introduce term **biodiversity**
- Complete **Activity I**
- Flagellate Plant Groups **WebQuest** & Share
- Share importance of preparation & preservation of botanical collections
- Play **GoFlag Video** about scientists, educators, & students
- Collect & Prepare Flagellate Plant Specimens (placed in school herbarium^{***})

^{***} any air tight container that stores botanical specimen packets is called an herbarium. If storing specimens in your classroom is not feasible, allow students to keep them.

*laptops will be needed

Elaborate | Day 3: Ecosystem Services & Human Impact on Flagellate Plant Diversity

Notes

- Introduction to **Ecosystem Services**
- **Plant Services Word Cloud**
- Flagellate Plant Services
- Construct explanations how humans disrupt ecosystem services and ultimately biodiversity.
- Introduce background rate of extinction & current rate

*laptops will be needed

Explain | Day 4: Flagellate Plants Morphology Module + Tree Thinking

Notes

- Students complete flagellate plants **morphology module**
- **Tree Thinking Activity**
- Introduction to Phylogenetic Trees
- Simple Phylogenetic Tree Constructions
- **Phylogenetic Tree Kahoot**

*Supplies: pipe cleaners, paper clips

*laptops will be needed

Evaluate | Day 5: Constructing Phylogenetic Tree & Designing Solutions

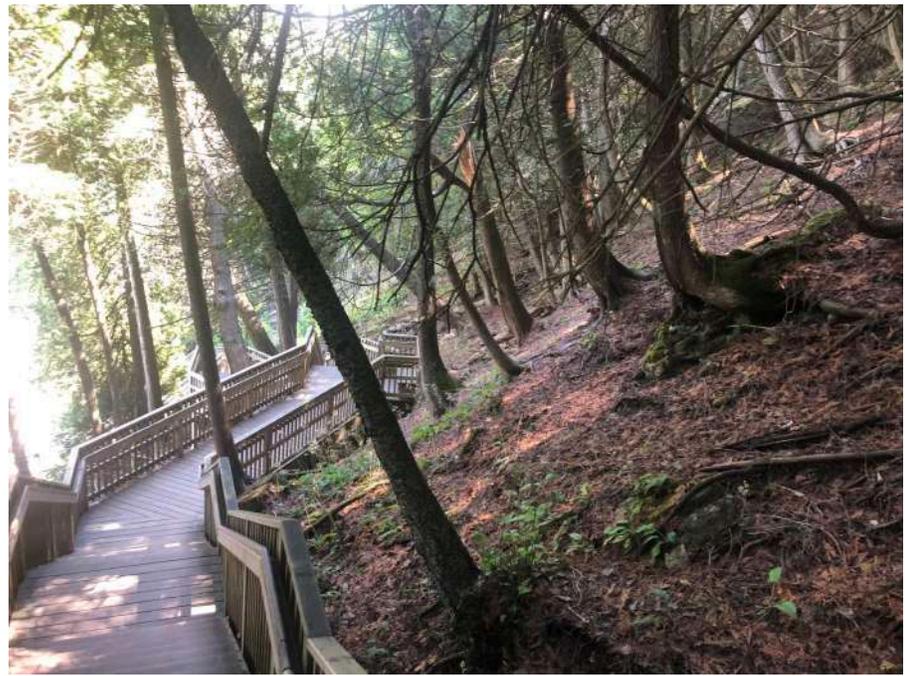
Notes

- Students construct phylogenetic trees of flagellate plants
- Students design solutions to address human impact on biodiversity and create visual representation of their solutions to disseminate to the public.
- Students evaluate each other's work using a **Rubric**

*Students work in table groups

*3 finished projects: Flagellate Plants Phylogenetic Tree Construction, written solutions, visual representation of solutions

Images I, II, III



Activity 1
A Walk through the Field

Activity	Living Examples (add sketch!)	Non-Living Examples (add sketch!)
A Walk Through the Field		