

Unit 7: Plant Form and Function

AP Biology

6 Class Meetings

Revised June 2019

Essential Questions

- How do the structures of plants allow them to transform energy?

Enduring Understandings with Unit Goals

EU 1: Plants acquire and transport resources and nutrition using specialized structures.

- Explain how the structure of plants allows for efficient photosynthesis.

EU 2: Plants reproduce sexually and asexually.

- Describe sexual and asexual reproduction in plant life cycles.
- Describe the chemical regulators involved in plant responses to their environments.

Standards

Next Generation Science Standards (NGSS):

- **HS-LS1-5.** Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

Common Core State Standards:

- **RST.11-12.1** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- **RST .11-12.8** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- **MP.2** Reason abstractly and quantitatively.
- **MP.4** Model with mathematics.

MSMHS Academic, Civic, and Social Competencies

Competency 1. Read and write effectively for a variety of purposes.

Competency 2. Speak effectively with a variety of audiences in an accountable manner.

Competency 3. Make decisions and solve problems independently and collaboratively.

Competency 4. Apply scientific knowledge and concepts to a variety of investigative tasks.

Competency 5. Contribute to a positive learning environment with respect and responsibility.

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Unit Content Overview

- Plant organs and structures
- Plant cellular differentiation
- Plant adaptations
- Soils
- Fungi and plant nutrition
- Photosynthesis
- Transpiration
- Regulation of stomata
- Flower structure and function
- Seed development, form, and function
- Pollination
- Fruit form and function
- Sexual versus asexual reproduction
- GMOs
- Plant hormones
- Photomorphogenesis
- Photoperiodism and seasonal events
- Response to environmental stress

Interdisciplinary Connections

- ECE Horticulture & Design: plant structure, function, reproduction, and response

Daily Learning Objectives with TWPS Activities

Students will be able to...

- Describe how specializations in plant organs and cells that are adaptations to life on land.
 - *The seedless banana, the world's most popular fruit, is losing the battle against two fungal epidemics. Why do such epidemics generally pose a greater risk to asexually propagated crops?*
- Explain how plants acquire resources and nutrients.
 - *Plants detect the quality of their light environment by using blue-light photoreceptors and red-light absorbing phytochromes. Why do you think plants are so sensitive to these colors?*
- Model transpiration in plants.
 - *How well does this lab model transpiration?*

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- Summarize the mechanisms of response in plants.
 - *What are some drawbacks of spraying fields with general-purpose insecticides?*

Instructional Strategies/Differentiated Instruction

- **HLP:** Academically Productive Talk
- **HLP:** Writing to Learn (TWPS)
- **HLP:** Effective Feedback
- Daily Warm Up Activities
- Power Point Lecture with note-taking
- Flexible grouping
- Foldables
- Exit slips
- Graphic Organizers
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Student use of headphones
- Independent reading
- Outlining of text
- Reading and Accountable Talk Discussion of Text
- Laboratory experiences

Assessments

FORMATIVE ASSESSMENTS:

- Transpiration Lab Report
 - MSMHS Rubric 4: Scientific Research
- Close reading and interpretation of text
- Outlining of textbook
- Warm Up Activities
- Exit slips
- Oral questioning
- Accountable Talk Discussions
- Daily Think-Write-Pair-Share (TWPS)
- Daily check-ins with students

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- Practice FRQs
- Practice MCQs
- Homework/Reading checks

SUMMATIVE ASSESSMENTS:

- Quiz on EU 1
- Quiz on EU 2
- Transpiration Lab Report
- Unit Test

Unit Task

Unit Task Name: Transpiration Lab Report

Description: Students will use information from this unit on the structure and function of plants (EU 1), as well as the ways plants acquire nutrients and resources in order to test and model transpiration. Students will conduct an investigation testing transpiration in plants, collect and analyze their data, and write a report of their findings and conclusions. Students will utilize the MSMHS Lab Report Writing Guidelines and be assessed using MSMHS Rubric 4: Scientific Research.

Evaluation: MSMHS Rubric 4: Scientific Research

Unit Resources

- Textbook (Biology in Focus AP Edition. Campbell et al. 2014. Pearson Education, Inc)
- Interactive Science Notebook
- MSMHS School-wide Rubrics
- Lab Supplies
- Graphing calculators
- Internet databases
- Laptops