Plant Systems

Interactions of Plant Systems

Table of Contents

Unit Objectives

Instructional Days: 7-9 days

- ***Know that xylem transports water up from the roots (Remember: Xy = High, so water goes up)***
- ***Know that phloem transports sugars down from the leaves (Remember: Phlo = low, so sugar down)***
- ***Identify methods of reproduction in plants:***
- ***Describe the function of the parts of a flower.***
    - *Male reproductive parts are called sta**men** (has men in the word!), includes the **anther** and **filament***
    - *Female reproductive parts are **pistils**; includes the **stigma, style, and ovary***
    - ***Petals** attract pollinators.*
    - ***Stems**-*

➔ *Produce **leaves**, branches, and **flowers***

➔ *Hold leaves up to the sunlight*

➔ *Transport substances between roots and leaves*

- ***Describe plants response to:***
    - *Light- **phototropism**-stems and leaves of plant grow in the direction of a light source*
    - ***Gravity-geotropism**- roots grow down into the soil so they are more apt to reach moisture and minerals in the soil*
    - *Touch- **thigmotropism**- plant tendrils grasp onto objects so that a plant can grow and be supported by the object.*
    - *Plant Hormones*
        - ➔ ***Auxins** - plant elongation at roots and stems*
        - ➔ ***Gibberellins** - seasonal growth*
        - ➔ ***Cytokines** - cell wall formation*
        - ➔ ***Ethylene Gas** - fruit to ripen*

Unit Vocabulary - page 1

Quizlet

auxins	*hormones in plants responsible for tropisms*
cone	*reproductive structure that produces seeds in some plants*
cuticle	*A waxy covering on the surface of stems and leaves that acts as an adaptation to prevent desiccation in terrestrial plants.*
cytokines	*Happens at same time as telophase, a cell plate forms using materials found in the vesicles*
flower	*reproductive organ of a plant. Contains both male and female reproductive structures*
geotropism	*the process whereby a plant responds to gravity*
gibberellin	*a hormone that stimulates plant stem elongation*
guard cell	*The two cells that flank the stomatal pore and regulate the opening and closing of the pore.*
homeostasis	*balance or equilibrium maintained by the body*
mesophyll cell	*A loosely arranged photosynthetic cell located between the bundle sheath and the leaf surface.*
ovary	*in flowering plants, the lower part of a pistil that produces eggs in ovules*
phloem	*tissue that conducts food (sugars, amino acids, and mineral nutrients) in vascular plants*
phototropism	*the process whereby plants respond to light stimulus by growing in the direction of available light*
pistil	*the female reproductive part of a flower that produces seeds and consists of an ovary, style, and stigma*
pith	*ground tissue internal to the vascular tissue*

Unit Vocabulary - page 2

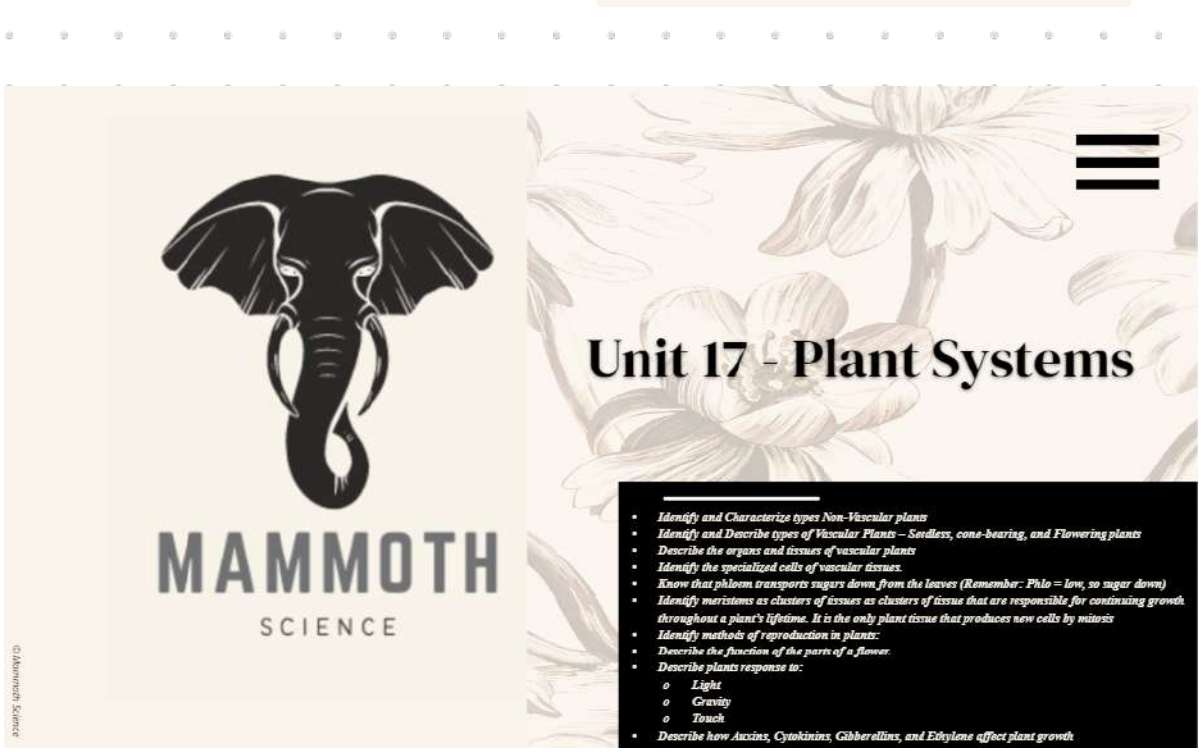
Quizlet

pollination	*transfer of pollen from the stamen to the pistil. It may happen from within the same pant or between two different plants*
roots	*Absorbs water and minerals from the ground. Anchors plant in the ground.*
seed	*forms after fertilization and contains a tiny, developing plant*
shoot system	*The aerial portion of a plant body, consisting of stems, leaves, and (in angiosperms) flowers.*
stamen	*the male reproductive structure of a flower that produces pollen and consists of an anther at the tip of a filament*
stoma	*small opening in the epidermis of a plant that allows carbon dioxide, water, and oxygen to diffuse into and out of the leaf*
thigmotropism	*process whereby plants respond to touch or physical contact with an object*
transpiration	*Evaporation of water from the leaves of a plant*
transport	*to carry or move from one place to another*
vascular system	*collection of specialized tissues in some plants that transports mineral nutrients up from the roots and brings sugars down from the leaves*
vascular tissue	*transports materials such as water, nutrients, and sugars throughout a plant*
xylem	*tissue in plants that transport water and mineral nutrients*

Slides

Here you will find the Google Slides Presentation for this Unit

Google Slides



Notes and Notes Key

Here is the notes and **Notes Key** for this Unit

Google Docs

Unit 17: Plant Systems - Notes Key
SPRING SEMESTER 2023

INSTRUCTOR:
instructor@email.com

Vocabulary / Key Terms/ Concepts	Unit 17: Plant Systems
	Student Expectations: • Identify and Characterize types **Non-Vascular plants** • Identify and Describe types of **Vascular Plants** – Seedless, cone-bearing, and Flowering plants • Types of Describe the **organs** and **tissues** of **vascular plants** • Identify the specialized cells of **vascular tissues**. • Know that **xylem** transports water up from the roots (Remember: Xy = High, so water goes up) • Explain **capillary action**. • Know that **phloem** transports sugars down from the leaves (Remember: Phlo = low, so sugar down) • Identify meristems as clusters of tissues as clusters of tissue that are responsible for continuing growth throughout a plant's lifetime. It is the only plant tissue that produces new cells by mitosis • Identify methods of **reproduction** in plants: ▫ Understand that the flower is the reproductive structure of a plant. • Describe the function of the parts of a **flower**.

Labs and Activities

Unit 17 - Plant Systems: Flower Parts & Plant Responses

INSTRUCTOR:
no_reply@example.com

Part I - Directions - Using your resources, answer the following questions below

Background Video: https://www.youtube.com/watch?v=HdcIclkSoIY

1. *What is the primary function of auxins in plants?*
2. *How do cytokinins promote cell division and growth in plants?*
3. *What is the role of gibberellins in seed germination and stem elongation?*
4. *How do abscisic acid and ethylene regulate plant responses to stress?*
5. *How can the balance of different plant hormones be manipulated to control plant growth and development?*

Plant Systems: Flower Parts & Plant Responses

Unit 17 - Plant Systems: Non-Vascular Plants

INSTRUCTOR:
no_reply@example.com

Directions - Answer the following Questions, using your resources (notes, chapter materials, websites, etc) Use complete sentences where necessary - Part II.

Part I - Multiple Choice: From the answer choices provided, choose the most correct answer and provide proof from your resources.

1. **Which of the following is NOT a type of bryophyte?**
   - A. Ferns
   - B. Mosses
   - C. Hornworts
   - D. Liverworts
2. **How do bryophytes transport water and nutrients through the plant?**
   - A. Through tubes
   - B. Through roots
   - C. Through osmosis
   - D. Through leaves
3. **What structures do bryophytes have instead of roots?**
   - A. Stems
   - B. Leaves
   - C. Rhizoids
   - D. Flowers
4. **How do bryophytes reproduce?**
   - A. Only sexually
   - B. Only asexually
   - C. Both sexually and asexually
   - D. Neither sexually nor asexually

1 ©Mammoth Science

Plant Systems: Non-Vascular Plants

Unit 17 - Plant Systems: Angiosperms - Monocot vs Dicot

INSTRUCTOR:
no_reply@example.com

Directions - Using the background information provided below, Complete a C.E.R on the Similarities and Differences of Monocots and Dicots

Monocots and dicots are two types of flowering plants that share some similarities but also have distinct differences. Both monocots and dicots have seeds, roots, stems, and leaves, and they undergo similar stages of growth and reproduction. However, monocots and dicots differ in the number of cotyledons, or seed leaves, they have. Monocots have only one cotyledon, while dicots have two. This is an important distinction because it affects the way these plants develop.

Another major difference between monocots and dicots is the arrangement of their vascular tissue. Vascular tissue is responsible for transporting water, nutrients, and other materials throughout the plant. In monocots, vascular tissue is arranged in bundles scattered throughout the stem, while in dicots, vascular tissue is arranged in a circular pattern around the stem. Additionally, monocots typically have parallel veins in their leaves, while dicots have branching veins. Overall, while monocots and dicots share some similarities, their differences in cotyledon number and vascular tissue arrangement have important implications for their growth and development.

Brainstorming

CER	Sentence Stems	The Pieces that Support
Claim	▪ The article suggests that there are both similarities and differences... ▪ According to the article, the number of cotyledons and arrangement of vascular tissue...	

1 ©Mammoth Science

Systems: Angiosperms - Monocot vs Dicot

Unit 17 - Plant Systems Article: Talk Read, Talk Write

INSTRUCTOR:
no_reply@example.com

Directions:

- ***Talk 1 - (5 minutes)*** *With a shoulder partner, discuss all that you know about viruses, replication cycles, virus structure, etc.*
- ***Read 1 - (10-15 minutes)*** *read the article here:* LINK
- ***Talk 2 - (5 Minutes)*** *discuss with your partner the main idea, main points, and summary of the article you just read.*
- ***Write:*** *In 5-7 sentences, write a summary of the article you just read.*

Flowering Plants Spelled the End of Gymnosperm Dominance

- *by* ERIN ZIMMERMAN

November 13, 2020

Coupled with the negative effects of global cooling, angiosperms pushed gymnosperm extinction past the point of recovery.

Again and again throughout evolutionary history, one clade of plants has arisen and had its 'moment in the sun' while another has gone into permanent decline. This is referred to as clade replacement. Because the factors that influence the success or failure of a group are many and complex, it is difficult to say conclusively whether

Plant Systems Article: Talk Read, Talk Write

Plant Systems - Seedless Vascular Plants

Unit 17 - Plant Systems: Seedless Vascular Plants

INSTRUCTOR:
no_reply@example.com

Part I - Choose from the word bank below the best answer for the following questions - complete the table below. Use your resources (notes, text, website, etc)

Word Bank:

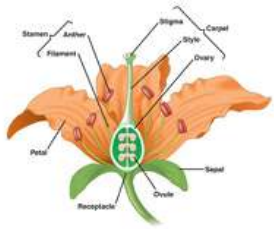
To make food by photosynthesis.
Spores
The diploid sporophyte.
Thin and heart-shaped.
Haploid.
On the underside of the gametophyte.
Water and minerals.
To support the plant and connect leaves and roots.

Question	Answer
1. What do roots absorb?	
2. What is the function of leaves?	
3. What is the function of stems?	
4. What is the dominant stage in the life cycle of ferns?	

Plant Systems Seedless Vascular Plants

Flower Dissection Lab | 2016-2017

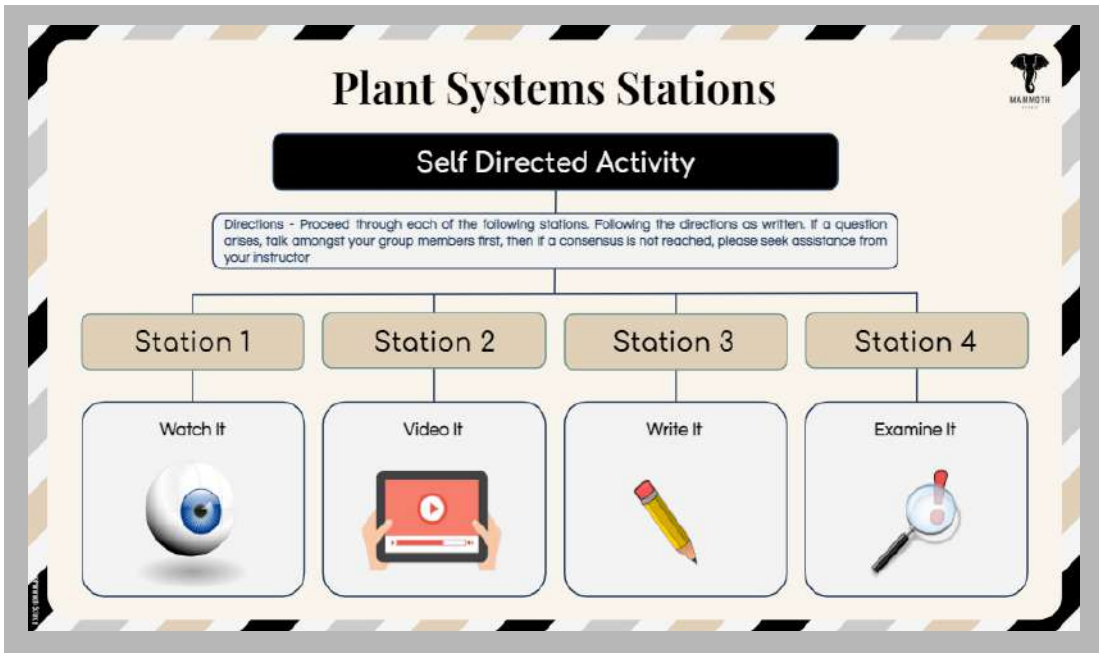
Use the reference sheet and descriptions below to identify and examine each part of your flower. Make a sketch of your flower in the space below. Include labels to identify the structures indicated in bold. (Note: Your flower may or may not have all of the structures listed.) Record how many of each part you find in your flower in the table below.



Label	Part	Total count	Description
A	**Sepals**		Thick outer green parts that protect the flower bud
B	**Petals**		Colored part that attracts pollinators
C	**Stamen**		Entire male reproductive structure (consists of **anther** and **filament**)
D	**Anther**		Cap at the end of the stamen that produces pollen.
E	**Filament**		Long fibrous structure that holds anther.
F	**Pistil**		Entire female reproductive structure (consists of **stigma**, **style** and **ovary**)
G	**Stigma**		Puckered top of the pistil.
H	**Style**		Long structure in the pistil going down to the ovary
I	**Ovary**		Swollen base at the bottom of the pistil where egg is housed.

Plant Systems Flower Dissection Lab

Plant Systems - Stations




Unit 17 - PlantSystems Stations

INSTRUCTOR

Station 1 - Watch It: *Answer the following based upon the content in the video*

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	

Plant Systems Stations Answer Doc

Video Resources

Here are the curated Video links from Youtube for this Unit

Plants - Structure & Function

- **Bozeman** - Plants: LINK
- **Bozeman** - Plant Structure: LINK
- **Bozeman** - Plant Nutrition & Transport: LINK
- **Bozeman** - Plant Control: LINK
- **Amoeba Sisters** - Plants: Diversity, Structure, & Adaptations: LINK
- **Amoeba Sisters** - Plant Reproduction in Angiosperms: LINK
- **Crash Course** - Plant Cells: LINK
- **Crash Course** - Vascular Plants: LINK
- **Crash Course** - Plant Reproduction: LINK
- **Crash Course** - Non-Vascular Plant Reproduction: LINK

Lesson Planning

Monday	Tuesday	Wednesday	Thursday	Friday

Lesson Planning - Template

Unit: Key Learning Objectives	Date: Time to Complete:

Day 1

Phenomena:			
Time:	Instructional Strategies	Practice	Modification

Lesson Planning - Template

Unit: Key Learning Objectives	Date: Time to Complete:

Day 2

Phenomena:			
Time:	Instructional Strategies	Practice	Modification

Lesson Planning - Template

Unit: Key Learning Objectives	Date: Time to Complete:

Day 3

Phenomena:			
Time:	Instructional Strategies	Practice	Modification

Lesson Planning - Template

Unit: Key Learning Objectives	Date: Time to Complete:

Day 4

Phenomena:			
Time:	Instructional Strategies	Practice	Modification

Lesson Planning - Template

Unit: Key Learning Objectives	Date: Time to Complete:

Day 5

Phenomena:			
Time:	Instructional Strategies	Practice	Modification

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Notes to Consider

Duplicate this slide to add more days for planning

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