Biology 5-2: Plant Systems

Assignments:

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<tr>
<th>Description</th>
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<th>Due Date</th>
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### Biology - 5th Six Weeks

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<th>THURSDAY</th>
<th>FRIDAY</th>
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<td>Quiz 2: Regulation</td>
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<td>Test - Animal Systems II</td>
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<td>Early Release</td>
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*Note: The dates and events are placeholders and should be replaced with actual dates and events.*
Botany - Plant Systems

Objectives:

- Compare and examine specialized cells, including roots, stems, and leaves of plants.
- Describe and compare the interactions that occur among systems that perform the functions of transport in plants.
- Describe and compare the interactions that occur among systems that perform the functions of reproduction, and response in plants.
- Analyze the levels of organization in biological systems, such as plants, and relate the levels to each other and to the whole system.
- Describe and explain the role of internal feedback mechanisms in the maintenance of homeostasis in plants.

Vocabulary you need to know:

<table>
<thead>
<tr>
<th>Angiosperm</th>
<th>Tropisms</th>
<th>Sorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bryophytes</td>
<td>Monocot</td>
<td>Germination</td>
</tr>
<tr>
<td>Gymnosperm</td>
<td>Dicot</td>
<td>Biennials</td>
</tr>
<tr>
<td>Xylem</td>
<td>Cotyledon</td>
<td>Perenials</td>
</tr>
<tr>
<td>Phloem</td>
<td>Pollination</td>
<td>Annuals</td>
</tr>
</tbody>
</table>

Essential Questions

- How do specialized cells and tissues work together to maintain homeostasis in plants?
- What differences exist in transport mechanisms between non-vascular and vascular plants, such as a moss and fern?
- How do plants respond to changes in their environment, such as gravity, light, and touch?
- How are reproduction methods different between non-flowering and flowering plants?
- How does the survival of a plant depend on its adaptations?
- Why is each level of organization important to the organism?
- How do the structures and characteristics of specialized cells (including roots, stems, and leaves) contribute to the plant’s ability to perform specialized functions?
- What structures of plants are involved in the process of photosynthesis? What affect would damage to particular plant cells have on the process of photosynthesis?
Photosynthesis: What’s in a Leaf?

Model 1 – Leaf Sun-Catcher

1. List three things entering the leaf in Model 1.

2. List three substances leaving the leaf.

3. Which substance is both entering and leaving?

4. Veins are important structures that carry materials through the leaf. Label the central vein in the leaf diagram.

5. How is the substance you identified in Question 3 changed between its entry and its exit?

6. Use the general equation for photosynthesis and Model 1 to answer the following questions.
   a. What are the reactants for photosynthesis?
   b. Where do these reactants enter the leaf?
   c. What are the products of photosynthesis?
   d. From where do the products leave the leaf?

7. Categorize all the components involved in photosynthesis as either matter or energy.
Introduction to Plants

Characteristics of plants
1. ______________________________
2. ______________________________
3. Cell Walls made of____________________
4. Carry out the process of_________ using Chlorophyll
5. Most are ___________ but a few are parasites and saprobes.
6. Store energy as __________________________

What do plants need to survive?
1. ________
2. ________
3. Minerals
4. Gas Exchange
5. Transport of ________ and ________ throughout the plant body

Write the Equation for Photosynthesis Below:

How did Plants Evolve?
- Plants most likely evolved from an organism like the freshwater multicellular green ___________ living today.
- Plants had to overcome “______________” as they moved from water to ____________:
  1. Adapt to be able to ____________ water
  2. Adapt features to _______________ water
  3. Be able to ________________ water more ________________________.

4 Main Plant Groups
1. __________________________
2. __________________________
3. __________________________
4. __________________________
3 Classification Features

1. ______________________
2. ______________________
3. ______________________

Vascular vs. Non-vascular Plants

Vascular plants contain tube-like cells for ________________.
- Can grow large and __________ away from water source.
- Examples of vascular plants include ______, __________, & __________.

Non-vascular plants does ____ contain ____________ cells for transport.
- Water and nutrients travel in and out of cells by ____________ and ____________.
- _______ and grows _______ to source of water.

PART 1: Bryophytes

BRYOPHYTES

Bryophyte - Non-vascular plants require ______________.
- Plants draw up water by __________ only a few centimeters above the ground.
- ______ growing plants that are found in ______, shaded areas.
- Bryophytes include ______, hornworts, and __________.

Rhizoids - A long thin cell that _______ moss to the ________.
- Found in mosses and _______ water and minerals from the ______.
- Draw an picture of a rhizoid in the box:

Circle the part of the plant that is a rhizoid.
Uses of Moss
Dead Moss can be _________________________ or added to soil to help

_________ ________ and ___________ ________.

PART 2: Ferns and Gymnosperms
Remember...Vascular plants have ________ tissue.
- Type of tissue specialized to conduct ________.
- Can grow ________ and survive away from their ________ source.

Vascular Structures
Vascular Tissue is gathered into veins made of:

1. **Xylem** - Transports ________ and ________ throughout the plant.
   - When someone cuts an old tree down, they reveal a set of rings. Those rings are the remains of old xylem tissue, one ring for every ________ the tree was alive.

2. **Phloem** - Transport ________ produced by photosynthesis to the roots of the plant.
   - Dripping sap (sugars) coming from a tree is usually from the ________.

   **REMEMBER:** Sap (sugar) **Phloes** out of the tree

Vascular Plants Include:

1. ___________ (seedless)
2. ___________ (cone bearing plants)
3. ___________ (flowering plants)

Ferns - ___________ vascular plants
- Require ________ for sperm to swim to egg.

Seed Plants are Divided into Two Groups:

1. ___________
   - Bear their seeds directly on the ________ of cones.
2. ___________ (Flowering Plants)
   - Bear their seeds within a layer of tissue that ________ the ________.
Gymnosperms

- __________ plants
- Produce seeds on scales of _________
- Gymnospore means “_________ Seeds”
- Includes ________ such as pines and spruces.

Advantages of Seeds

1. Seeds provide a ______ supply for the _______ plant.
2. _______ by the seed coat.
3. Easily _________ to new areas so not as much competition with parents.
   - Female gametophyte develops inside the ________.
   - Male gametophyte develops inside the ________ grain.

Seeds in Gymnosperms

- Most gymnosperms produce ______ in woody ______.
- ___________ in gymnosperms takes place in ________.

Conifers: The Largest Group of Gymnosperms

Conifers Contain Needles to Help Reduce Water Loss By:

1. The _________ of the needle results in reduced _________.
2. Thick, _______ layer on the conifer reduces water ______.
3. Openings of the leaves that allow for gas exchange are located in cavities _________ the _________ of the leaf.

Another Adaptation:

Branches and needles are ___________ so they don't _______ with the weight of the snow.

Some Characteristics of Gymnosperms

- Most conifers are “__________.”
  - They retain their leaves ________ the year.
    - Most needles stay on the plant for 2-___ years.
• Can carry on ___________ as soon as spring arrives!
• A few are deciduous.
  • Deciduous - Lose their ______ at a particular season.
  • Are ______ in the winter.

Other Adaptations:
1. Some gymnosperms can grow tall because ______ tubes (tracheids) that transport ______ and dissolved ________.
   - Tracheids – Key cells in the xylem that are connected end to end like a series of drink ______
2. ______ reduces water loss.

PART 3: Angiosperms

What are angiosperms?
1. ______ plants.
2. Produce ________.
3. Develop _______ in fruits which help protect ________.

Two Classes of Angiosperms
1. ________
2. ________

Monocots:
• _____ seed leaf
• Includes: Grasses, Orchids, Lilies, and Palms
• Contains _______ veins in leaves
• Flower parts exist in multiples of ________.

Dicots
• _____ seed leaves
• Most are _______ plants
• Includes: Shrubs, trees, wildflowers, garden flowers, herbs
• Leaves contain _______ veins
• Flower parts exist in multiples of ____ or ____
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<tr>
<th></th>
<th>Monocots</th>
<th>Dicots</th>
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<tr>
<td>Flowers</td>
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<td>Leaves</td>
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<td>Vascular Tissue</td>
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<td>Root Pattern</td>
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<td>Embryo in Seed</td>
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**Life Span of Angiosperms**

Can either be classified as:

1. _______
2. _______

**Annuals** - Live only _____ growing season.

- Examples: Many garden plants (marigolds, petunias, pansies, and zinnias), wheat, and cucumbers.

**Perennials** - Live for more than _____ years.

- Examples: Palm trees, sagebrush, _____ trees, honeysuckles, asparagus, many ______.
General Vascular Tissue Terms

- **Xylem** - Tubes that carry _______ and _______ from the roots of plants to all of the cells.
- **Phloem** - Tubes that carry ______ from the leaves of the plants to all of the other cells.
- **Cambium** - ______ tissue that makes new _____ and ______.

Root Structures of Angiosperms

Two Types of Root Structures:

1. **Taproot System** - Large ______ root and are usually found in ______.
2. **Fibrous Root System** - Highly branched and are usually found in ______.

More About Roots

- **Root Hairs** - Increase _______ _______ for absorption.
- **Root Cap** - Covers the tip of the root and ________ it.
- **Meristem** - Growth area just behind the root cap.

Two Kinds of Stems:

1. **Herbacous** - ______
2. **Woody** - ______
   - Have growth ______ of vascular tissue that determine the _____ of the plant.

More About Leaves

- **Simple Leaves** – _____ leaf blade attached to stem
- **Compound Leaves** – ______ leaf blade attached to stem
- **Petiole** – ______ that attaches leaf to stem
Cross Section of a Leaf

The bulk of most leaves consist of a specialized ground tissue full of ______ known as MESOPHYLL. The mesophyll contains two layers:

1. **Palisade Layer** – ________ packed tall columnar cells; located under the upper epidermis and absorb ______ that enters the leaf.

2. **Spongy Layer** – ________ tissue made of spherical cells that contains many air ______ between its cells; the air spaces ______ with the ___________ through the stomata (porelike openings that allow ______ to enter and leave the leaf).

How Materials Move Through the Vascular Tissue

As water is lost by ___________ (the evaporation of water from the leaves), it is pulled upwards through the _________ like a drinking straw.

Sugars move by _______ transport and ______ through the phloem from the source to the sink (place that stores or uses sugars).

**PART 4: REPRODUCTION OF FLOWERING PLANTS**

Flowers are ______ organs that are composed of four kinds of specialized leaves:

1. ______
2. Sepals
3. ______
4. Carpels (also called Pistils)
______ – Brightly colored structure just inside the sepals; attracts _______ and other pollinators to a ________.

______ – Outermost circle of flower parts that ______ a _____ before it opens and protects the flower while it is developing.

**Male Part of Flowers**

______ – Male part of the flower; Made up of an anther and a filament.

• **Anther** produces _______ containing sperm.

• **Filament** _______ the anther

**Female Part of Flowers**

**Pistil (or Carpel)** – _______ part of a plant; Innermost part of a flower that produces the female gametophyte.

• **Stigma** - Sticky portion located at the ______ of the style where pollen frequently lands

• Broad base forms an _______ which contains one or more ovules (contains eggs inside).

• The diameter of the carpel narrows into a _______ called a **style**.

A ____________ flower has all four organs, and an ____________ flower lacks one or more organs.

**Pollination**

**Pollination** – Transfer of ______ from the ______ to the pistil.

**Methods of Pollination:**

1. ________

2. ________ (most are pollinated by animals)
Pollination Adaptations That Attract Animals:
1. __________
2. Petal Color
3. __________
4. 

Types of Pollination
Self-Pollination - ________________________________.
Cross-Pollination - ________________________________.

Reproduction of Flowers
Reproduction in flowers is similar to gymnosperms in that both produce __________ and gametophytes are within the ______ of the sporophyte.

Fertilization in Flowers
1. Pollen grain lands on the _______.
2. The pollen tube cell grows a ______ to the _______.
3. The two sperm cells move through the ______ into the _______.
   - One sperm joins with the ______ in the ovule.
   - The other joins with the central _____ (2N) to form the endosperm (3N)
     - The process is called ________________.
     - Double Fertilization - Fertilization in angiosperms, in which _____ distinct fertilization _____ take place between the male and female gametophyte.

Seed Formation
1. After fertilization occurs, the flower ______ and the seed ___________.
2. Ovule becomes the seed coat which protects the ___________.
3. The zygote ___________ becoming the embryo.
4. The 3N central cell develops into the endosperm which is ____________ tissue.
Fruits

● The _________ develops into a _________, which can be _____ (nuts and grains) or _______ (oranges, peaches, squash, or tomatoes).
● Fruits have two main jobs: To __________ the seed and to aide in _________.

Seeds

● Seeds can remain ______________ until conditions are right for development and growth.
  ○ Water, ______, and favorable temperatures are usually needed.
● Germination – Early plant stage of a plant ________.
  ○ Germination is the _________ of the seed into a new ________.
● During growth, _______ appears first, and then the ________ and finally the _________.

Plant Growth and Development

Plants respond to stimuli from the environment. This process is called ________.
  - Positive Tropism - Growth ________ the stimulus.
  - Negative Tropism – Growth ________ from the stimulus
  - Phototropism – Growth towards ________
  - Gravitropism – Response to ________
  - Thigmotropism - Response to ______________

PART 5: PLANT ADAPTATIONS

Life in Water

● Have tissues with large air-filled spaces through which ___________ can diffuse down the stem
● Seeds that float and ___________ germination
● Specialized air roots that allow __________ to get to the ___________ down in the mud

Salty Conditions

● Specialized cells in the ___________ that pump the salt out of the plant tissue onto the leaf ___________ where rain washes it off

Desert Plants

● _________________- To reach far down to obtain water or shallow to obtain water
● _________________- Cactus needles—reduced surface area
● _________________- To store water
• Germinate only when enough moisture present.

Poor Soil

• If the soil can't provide _____, plants trap and digest _____________ that release ____.
• Plant can be ______________ and extract nutrients and water __________ from its host's tissues.

Plants without Roots

• Live on body of ___________ plant
• No roots = live in a __________ environment to retain/store __________ from rainfall.

Fighting Insects

• Make/secrete ___________ that are toxic if eaten

Need for Pollination

• Plants will __________ a pollinator's mate
Plant Poster

**Directions:** To prepare for the quiz, add each of the following details to the plant poster on to the picture of the leaf on the next page.

1. Identify the roots, stem, and leaves.
2. Add oxygen and carbon dioxide molecules floating into and out of the leaves.
3. Draw a bryophyte growing on the ground.
4. Write one sentence that describes the bryophytes characteristics.
5. Turn the main plant into an angiosperm by adding a flower to its stem.
6. Label the stomata through which these molecules are flowing.
7. Draw a section of the stem and label the dermal, ground, and vascular tissue.
8. Label the xylem and phloem in your sectional drawing.
9. Write one sentence that describes the differences between the xylem and phloem.
10. Label the male and female parts of the flower.
11. Based on the root structure, decide if the plant is a monocot or dicot.
12. Add 2 mycorrhizae.
Plant Poster
Plant Groups

Matching: Write the correct letter before each of the following key vocabulary words.

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<tbody>
<tr>
<td>1.</td>
<td>_____ Leaves</td>
<td>a) cells that strengthen and transport material in plants</td>
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<tr>
<td>2.</td>
<td>_____ Stem</td>
<td>b) gathers water and nutrients from the soil</td>
</tr>
<tr>
<td>3.</td>
<td>_____ Roots</td>
<td>c) small, non-vascular, seedless, require water</td>
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<td>4.</td>
<td>_____ Eukaryotic</td>
<td>d) organisms that create own food using the sun</td>
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<td>5.</td>
<td>_____ Autotrophic</td>
<td>e) evergreen, seed producing plant with cones</td>
</tr>
<tr>
<td>6.</td>
<td>_____ Vascular</td>
<td>f) creates glucose through photosynthesis</td>
</tr>
<tr>
<td>7.</td>
<td>_____ Bryophytes</td>
<td>g) medium, vascular, seedless plants that produce spores</td>
</tr>
<tr>
<td>8.</td>
<td>_____ Sporophytes</td>
<td>h) flower producing plant, woody, range of climates</td>
</tr>
<tr>
<td>9.</td>
<td>_____ Gymnosperms</td>
<td>i) organisms that contain cells with a nucleus</td>
</tr>
<tr>
<td>10.</td>
<td>_____ Angiosperms</td>
<td>j) transports water and nutrients through a plant</td>
</tr>
</tbody>
</table>

Categorize: In the boxes below determine each plant’s major group and state a reason for that decision.

<table>
<thead>
<tr>
<th>Plant</th>
<th>Group (circle one)</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image of plant]</td>
<td>Bryophyte Sporophyte Gymnosperm Angiosperm</td>
<td></td>
</tr>
<tr>
<td>[Image of plant]</td>
<td>Bryophyte Sporophyte Gymnosperm Angiosperm</td>
<td></td>
</tr>
<tr>
<td>You Choose! Find a specimen in your backyard and bring it to school.</td>
<td>Bryophyte Sporophyte Gymnosperm Angiosperm</td>
<td></td>
</tr>
</tbody>
</table>
**Concept Map:** Fill in the missing terms in the plant group web below. Apple Tree, Angiosperms, Bryophytes, Fern, Non-Flowering, Gymnosperms, Creates Spores, Pine Tree

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**Plant Group Scavenger Hunt**

This activity is to be completed in the classroom. Find the plant pictures around the room and write the name of the plant group they belong as either *bryophyte, sporophyte, gymnosperm, or angiosperm.*

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
6. __________________________
7. __________________________
8. __________________________
9. __________________________
10. __________________________
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14. __________________________
15. __________________________
16. __________________________
17. __________________________
18. __________________________
Plant Structure, Function, & Reproduction

**Matching:** Write the correct letter before each of the following key vocabulary words.

<p>| | | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td>1.</td>
<td>_____ Dermal</td>
<td>k) allow CO₂, O₂, and H₂O to diffuse in and out of the leaf</td>
</tr>
<tr>
<td>2.</td>
<td>_____ Ground</td>
<td>l) group of angiosperms with two cotyledons</td>
</tr>
<tr>
<td>3.</td>
<td>_____ Vascular</td>
<td>m) carries water from the roots up to the leaves</td>
</tr>
<tr>
<td>4.</td>
<td>_____ Xylem</td>
<td>n) process that moves water through the plant</td>
</tr>
<tr>
<td>5.</td>
<td>_____ Phloem</td>
<td>o) tissue that transports water and nutrients through the plant</td>
</tr>
<tr>
<td>6.</td>
<td>_____ Monocot</td>
<td>p) tissue that supports the dermal and vascular tissue</td>
</tr>
<tr>
<td>7.</td>
<td>_____ Dicot</td>
<td>q) used to open and close the stomata</td>
</tr>
<tr>
<td>8.</td>
<td>_____ Guards cells</td>
<td>r) group of angiosperms with one cotyledon</td>
</tr>
<tr>
<td>9.</td>
<td>_____ Stomata</td>
<td>s) carries nutrients from the leaves down to the roots</td>
</tr>
<tr>
<td>10.</td>
<td>_____ Transpiration</td>
<td>t) tissue that protects the outer surface of the plant</td>
</tr>
</tbody>
</table>

**Concept Map:** Fill in the missing terms in the plant structure web below with Collect, Leaf, Glucose, Stem, Oxygen, Transport, or Roots.

```
Plants
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  |               |               |
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Photosynthesis
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  |               |               |               |               |
  |               |               |               |               |
  |               |               |               |               |
Water and Nutrients
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Anatomy of the Leaf: Read the following passage about the parts of a leaf. Color the cross section of the leaf. Answer the questions about the passage.

The leaf is the primary photosynthetic organ of the plant. The outer surface of the leaf has a thin waxy covering called the cuticle (A), this layer’s primary function is to prevent water loss within the leaf. Color the cuticle light green. Directly underneath the cuticle is a layer of cells called the epidermis (B). Color the epidermis yellow. The vascular tissue, xylem (G), which transports water, and phloem (H), which transports sugar, are found within the veins of the leaf. Veins are actually extensions that run from the tips of the roots all the way up to the edges of the leaves. The outer layer of the vein is made of cells called the bundle sheath cells (E), and they create a circle around the xylem and the phloem. Color the bundle sheath cells dark blue, the xylem orange, and the phloem purple.

Within the leaf, there is a layer of cells called the mesophyll (D & F). The word mesophyll is greek and means “middle leaf”. Air spaces in the mesophyll allow for gas exchange. The mesophyll cells are packed with chloroplasts, and this is where photosynthesis actually occurs. Color the mesophyll dark green.

The leaf also has tiny holes within the epidermis, called stomata, which allows the exchange of gas. Specialized cells, called guard cells (C) surround the stomata and are shaped like two cupped hands. Changes within water pressure cause the stoma (singular of stomata) to open or close. If the guard cells are full of water, they swell up and bend away from each other which opens the stoma. During dry times, the guard cells close. Color the guard cells pink.

1. What two tissues are found within a vein? ________________________________
2. What does the word mesophyll mean? ________________________________
3. What part of the leaf prevents water loss through transpiration? ________________
4. What layer contains chloroplasts? ________________________________
5. What are the openings that allow for gas exchange? ________________________________
6. What cells function to open and close the stomata? ________________________________
7. ______ A stoma in the lower surface of the leaf has a function most similar to the function of which cell structure?  
   A) Cell membrane  
   B) Vacuole  
   C) Ribosome  
   D) Nucleus
Anatomy of the Flower: Read the following passage, label the parts of the flower using the bold words from the passage, and answer the following questions about the structure and function of the flower.

Flowers are the reproductive structures of angiosperms. Flowers are usually both male and female, and are brightly colored to attract insects to help them carry pollen used for sexual reproduction. Not all flowers are colorful, though. These flowers usually use the wind for pollination.

The receptacle is the part of the branch on which a flower forms. Color the receptacle brown. Sepals are leaf-like structures that surround and protect the flower before it blooms. Color the sepals green. Petals are colorful parts of the flower that attract insects and even other small animals, such as mice, birds, and bats. Color the petals a bright color of your choice. All angiosperms have flowers, but some are not brightly colored. The petals of these flowers are reduced or absent and the plant relies on the wind or water for pollination.

The flower has both male and female reproductive parts. The female reproductive structures are collectively called the pistil. Color the pistil pink. The pistil has 3 parts. The stigma at the top is often sticky and is where the pollen attaches. The style is the long tube that attaches the stigma to the ovary. The ovary houses the ovules or eggs.

The male reproductive structures are called the stamens. Each stamen consists of an anther, which produces pollen, and a filament, which supports the anther. Color the anther yellow and leave the filament white. Pollen produced by the anther is carried by insects or other animals to the pistil of another flower where it may fertilize the eggs.

Sexual reproduction in plants occurs when the pollen (sperm) from an anther is transferred to the stigma. Plants can fertilize themselves. Self-fertilization occurs when the pollen from an anther fertilizes the eggs on the same flower. Cross-fertilization occurs when the pollen is transferred to the stigma of an entirely different plant.

When the ovules are fertilized, they will develop into seeds. The petals of the flower fall off leaving only the ovary behind, which will develop into seeds. The petals of the flower fall off leaving only the ovary behind, which will develop into a fruit. A fruit is any structure that encloses and protects a seed. This could be oranges, apples, acorns, or even peanuts. When you eat a fruit, you are actually eating the ovary of the flower.

1. What is an angiosperm? _____________________________________________________________
2. Why are flowers brightly colored? __________________________________________________
3. Name two mammals that might pollinate a plant. ________________________________
4. The female reproductive structures are called the ________________________________
5. Name 3 parts of the pistil. ______________________________________________________
6. Where are the ovules or eggs stored? __________________________________________
7. Name two parts of the stamen. _________________________________________________
8. What structure does the ovary develop into? ______________________________________
9. Some flowers are not brightly colored at all, but have a very pungent odor that smells like rotting meat. How do you think these flowers are pollinated? _______________________________________
10. In many flowers, the pistils and stamens reach maturity at different times. Considering what you know about pollination, why would this be an advantage to the plant? ________________________________
Crosswords Return! You know what to do.

Across
3. In plants, it is the process of transferring pollen to the ovary which results in seeds and a fruit
4. Vascular tissue that transports water from the roots up
5. Tissue that supports dermal and vascular tissue
6. Control the process of transpiration by allowing CO₂, O₂, and H₂O to diffuse in and out of the leaves
11. Process of drawing water through the plant by allowing water to evaporate out of the leaves
13. Vascular tissue that carries nutrients from the leaves down
14. Small non-vascular plants that require water to reproduce

Down
1. Tissue that protects the outer surface of the plant
2. Tissue that transports water and nutrients through the plant
5. Medium to large vascular plants that reproduce by creating cones
7. Outer coating of the leaf that limits water loss
8. Small to medium sized vascular plants that reproduce by dropping spores
9. Female reproductive part of a flower (consists of a style, stigma, and ovary)
10. Male reproductive part of a flower (consists of the anther and filament)
12. Medium to large vascular plants that reproduce by creating flowers/fruit

Wordbank
- dermal
- ground
- vascular
- xylem
- phloem
- bryophyte
- sporophyte
- angiosperm
- gymnosperm
- transpiration
- stomata
- cuticle
- stamen
- pistil
- fertilization
Plant Test Review

1. What are 6 characteristics of all plants?

2. What are the 3 things a plant needs to make its own food? Think about the photosynthesis equation.

3. What are the differences between vascular and nonvascular plants?

4. What are the 4 different kinds of plants?

5. What is alternation of generations and which plants use this to reproduce?

6. Why are mosses so small?

7. What is the function of the xylem? What is the function of phloem?

8. The pollen grain contains the __________ which travels down the pollen __________. The sperm unites first with the ____________, then with the ________________.

For the following descriptions in #9-25, indicate if they are describing angiosperms (A), gymnosperms (G), ferns (F), or bryophytes (B). Some answers may have more than one plant.

9. Does not have vascular tissue.
10. Does not produce seeds
11. Produces seeds that are protected in a fruit?
12. Produces seeds that are uncovered or “naked”
13. Cone bearing
14. Flowering plants
15. Seedless
16. Nonvascular
17. Vascular
18. Bear their seeds directly on cones
19. Produce flowers
20. Must live near water source
21. Require water for sperm to swim to egg
22. Does not require water for fertilization
23. Often small in size
24. Examples include mosses, hornworts, and liverworts
25. Examples include conifers such as pines and spruces

26. What are the two classes of angiosperms?

27. What are the differences between monocots and dicots?

28. There are two types of root structures: taproot system and fibrous root system. Draw a picture that represents each root system.

29. What are the 3 functions of a stem?

30. The bulk of most leaves consist of a specialized ground tissue full of chloroplasts known as ________________.

31. The mesophyll consists of which two layers? Describe each layer.

32. Label all the structures in the picture of the cross-section of a leaf.

33. In what two layers of cells in the leaf does most photosynthesis take place?

34. What is a petiole? Draw a picture to represent it also.
35. What is transpiration?

36. What is the difference between simple and compound leaves?

37. What is phototropism? Draw a plant showing phototropism.

38. What is gravitropism? Draw a plant showing gravitropism.

Use the flower drawing to the right:

39. Label B, C, D, E, F, G, J on the picture

40. Identify the male parts and the female parts.

41. What part becomes the fruit and protects the seed?

42. Where is pollen produced?

43. Where does pollen frequently land?

44. The __________ develops into the fruit.
KINGDOM PLANTAE

nonvascular

Example:
Characterized by:

Reproduce using

vascular (has xylem, phloem)

Characterized by:

Divided by:

Two divisions:

Example:

Means

Reproduce using

Conifers

Characteristics

Has one cotyledon (seed leaf)
Floral parts in multiples of three
Parallel veins in leaves
Fibrous roots

Means

Two divisions

Characteristics

Has two cotyledons (seed leaves)
Floral parts in multiples of 4 or 5
Branching veins in leaves
Tap roots

Flowers

Word Bank:
Angiosperms
Bryophytes
Cones
Dicot
Enclosed Seed
Ferns
Gymnosperm
Has True Roots, Stems & Leaves
No True Roots, Stems or Leaves
Tracheophytes
Small Size
Spores
Spores
Naked Seed
Monocot
Mosses
Seeded
Seedless