**Plant Parts and Functions:**
Seed-producing plants generally have four basic structures, or parts, that perform certain functions.

- **Roots** anchor the plant and take in water and nutrients from the soil.
- The **stem** provides support and moves water and nutrients throughout the plant.
- **Leaves** carry out photosynthesis and make food for the plant.
- **Flowers** allow the plant to reproduce. They attract pollinators and produce seeds.

**Photosynthesis:**
Green plants produce their own food through a chemical process called **photosynthesis**. This process takes place inside the plant’s leaves. The leaves contain a pigment called **chlorophyll**. Chlorophyll traps sunlight inside the leaves. Carbon dioxide also enters the leaves through tiny holes called stomata. During photosynthesis, the plant uses the sunlight, carbon dioxide, and water to make its own food (in the form of sugar). The plant also produces oxygen, which it releases as a waste product.

\[ \text{sunlight} + \text{carbon dioxide} + \text{water} = \text{sugar and oxygen} \]

Green plants are very different than animals because they are able to use energy from the sun to make their own food. They are called producers, and they are the first step in most food chains.
Reproduction:
The goal of all of plants is to reproduce, or to make more of themselves. They do so by making seeds or spores. Seeds and spores contain the genetic material needed to grow a new plant. Under the right conditions, seeds and spores will germinate, or begin to grow into plants.

Flowering plants, including trees, produce seeds. Seeds vary in size, from as small as a piece of dust to as large as a coconut. Some seeds grow inside a fruit or vegetable (i.e., apples and pumpkins).

- Each seed contains an embryo, which holds the basic organs of the plant body. The seed also contains stored food that the embryo will use until the seed begins to germinate. Many seeds also have protective outer layers called seed coats.
- The seeds are dispersed, or moved away, from the parent plant through a variety of ways, including wind, water, or by animals.

Other plants, such as ferns and mosses, reproduce by making spores. Spores are released by the parent plant and are carried away by the wind. If they land somewhere suitable, they may grow into new plants.

Parts of a Flower:
The flower is the reproductive part of the plant. It produces seeds that will grow into new plants. Each part of the flower has a role in the reproductive process.

<table>
<thead>
<tr>
<th>Part</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petal</td>
<td>This brightly colored, modified leaf attracts pollinators with its colors, patterns, and/or scent.</td>
</tr>
<tr>
<td>Sepal</td>
<td>This leaf surrounds and protects the growing flower.</td>
</tr>
<tr>
<td>Stamen</td>
<td>This structure produces pollen.</td>
</tr>
<tr>
<td>Pistil and Stigma</td>
<td>The stigma (at the very top of the pistil) is sticky; pollen sticks to it and travels down the pistil to the ovary.</td>
</tr>
<tr>
<td>Ovary</td>
<td>The ovary is at the bottom of the pistil. It holds the ovule(s).</td>
</tr>
<tr>
<td>Ovule</td>
<td>This plant structure will grow into a seed (if it receives pollen).</td>
</tr>
</tbody>
</table>
Pollination:

Pollination is the process of transferring pollen from flower to flower - from the stamen of one plant to the stigma of another. Pollination is important to the reproductive process because flowers need pollen in order to make seeds.

Pollinators move pollen grains between flowers. Common pollinators include honeybees, butterflies, birds, bats, and other animals. (They usually come to the flower in search of food.) Humans, wind, and water can also act as pollinators.

As pollinators move from plant to plant, they pick up pollen from the stamen of one flower and leave it on the stigma of another. Next, part of the pollen grain travels down the pistil to the ovary. If it reaches the ovule, the ovule will develop into a seed.

Pollen must be moved between flowers of the same species in order for seeds to be produced (i.e., from one daisy to another daisy). In some cases, though, only one flower is needed. Self-pollination occurs when pollen from one flower’s stamen is transferred to the same flower’s stigma.

Plant Adaptations:

Like animals, plants must adapt to changes in the environment in order to survive. Adaptations are special features that allow the plant to survive in certain conditions.

One common plant adaptation is dormancy. Dormancy is a period of time during which plants suspend, or stop, their life processes. It is brought on by changes in the environment, such as extreme temperatures or drought. For example, most plants are dormant during the winter, when the temperature is much colder. This period of rest helps them to survive until warmer temperatures return.

Other adaptations include a plant’s response to light and moisture. Plants depend on sunlight and water to survive, but these aren’t always readily available to all plants. Many plants have adapted ways to live in environments where there is only a little sunlight or water - or where there is too much. For example:

- Cacti live in dry environments. They have adaptations that allow them to thrive on little water. For instance, they might use extensive root systems or store water inside their stems.
- Sunflowers require full sun exposure (a lot of light) to grow. The head of the flower follows the sun as it moves through the sky, maximizing the amount of sunlight the flower receives.
Plants Review

**Directions:** Use the plant to the right to answer Questions 1-4. For Questions 1 and 2, write A, B, C, or D.

1. Which part of the plant is responsible for carrying out photosynthesis? ______
2. Which part of the plant is responsible for reproduction? ______
3. Circle the letter representing the stem. What are the two functions of the stem?
   _________________________________________________________________
   _________________________________________________________________
4. Someone removes part D from the plant. What two things will the plant no longer be able to do?
   _________________________________________________________________
   _________________________________________________________________

**Directions:** Use the words in the word bank to complete the sentences below. Hint: not every word will be used!

<table>
<thead>
<tr>
<th>stomata</th>
<th>sunlight</th>
<th>carbon monoxide</th>
<th>chlorophyll</th>
<th>oxygen</th>
<th>sugar</th>
<th>borophyll</th>
<th>carbon dioxide</th>
<th>water</th>
</tr>
</thead>
</table>

5. Green plants use _____________________________ to trap sunlight in their leaves.

6. What are the three “ingredients” needed for photosynthesis?
   _________________________________________________________________

7. During the process of photosynthesis, plants produce:
   ______________________________ and ______________________________.
Directions: Write your answers to the questions below.

8. How does photosynthesis affect humans?

_______________________________________________________________

_______________________________________________________________

9. Plants can be divided into two general groups: those that make _______________ and those that make _______________.

10. Why do plants have flowers?

_______________________________________________________________

_______________________________________________________________

11. ____________________________ is the transfer of pollen between flowers.

12. Give an example of a pollinator: _________________________________

13. Complete the cause-and-effect chart below.

<table>
<thead>
<tr>
<th>Cause:</th>
<th>Effect:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the natural pollinators of a certain flower disappear.</td>
<td></td>
</tr>
</tbody>
</table>

14. Use the letters in the word bank to label the parts of the flower.

   Word Bank:
   A - ovary
   B - ovule
   C - petal
   D - pistil
   E - sepal
   F - stamen
   G - stigma

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Directions: Match each flower part to its description.

15. ______ ovary  A. the part of the flower where pollen is made
16. ______ petal  B. the bottom part of the pistil, which holds the ovule(s)
17. ______ pistil  C. the sticky top part of the pistil that receives pollen
18. ______ sepal  D. the structure in the center of the flower that receives pollen and produces ovules
19. ______ stamen  E. a small outer leaf that protects the developing flower
20. ______ stigma  F. a brightly colored, modified leaf that attracts pollinators

Directions: Write your answers to the questions below.

21. What must happen in order for a seed to form? Use the following words in your explanation: pollen, stamen, stigma, pistil, and seed.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

22. What is one way that a parent plant can disperse its seed(s)?

________________________________________________________________________

23. A seed contains stored food and an ____________________, which will grow into a plant if the seed germinates.

24. Name a type of plant that produces spores: ______________________________

25. A plant that is inactive is called _____________________.

26. Give an example of a plant adaptation.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Plants Review

Directions: Use the plant to the right to answer Questions 1-4. For Questions 1 and 2, write A, B, C, or D.

1. Which part of the plant is responsible for carrying out photosynthesis? ___B___

2. Which part of the plant is responsible for reproduction? ___A___

3. Circle the letter representing the stem. What are the two functions of the stem?
   The stem supports the plant and moves water and nutrients through the plant.

4. Someone removes part D from the plant. What two things will the plant no longer be able to do?
   The plant won’t be able to anchor itself in the ground or absorb water and nutrients from the soil.

Directions: Use the words in the word bank to complete the sentences below. Hint: not every word will be used!

stomata sunlight carbon monoxide chlorophyll oxygen sugar borophyll carbon dioxide water

5. Green plants use ______________ chlorophyll ______________ to trap sunlight in their leaves.

6. What are the three “ingredients” needed for photosynthesis?
   sunlight, water, and carbon dioxide

7. During the process of photosynthesis, plants produce:
   ______________ sugar ______________ and ______________ oxygen ______________.
Directions: Write your answers to the questions below.

8. How does photosynthesis affect humans?
   
   During photosynthesis, plants produce and release oxygen, which humans need (to breathe) in order to live.

9. Plants can be divided into two general groups: those that make _______ seeds _______ and those that make _______ spores _______.

10. Why do plants have flowers?

   The flower is the reproductive part of the plant. Flowers make seeds, which allows the plant to reproduce.

11. _______ Pollination _______ is the transfer of pollen between flowers.

12. Give an example of a pollinator: bee, hummingbird, bat, wind, etc.

13. Complete the cause-and-effect chart below.

   **Cause:**
   
   All of the natural pollinators of a certain flower disappear.

   **Effect:**
   
   Sample answer: The flower won’t be pollinated, so it won’t be able to make seeds and reproduce.

14. Use the letters in the word bank to label the parts of the flower.

   **Word Bank:**
   
   A - ovary
   B - ovule
   C - petal
   D - pistil
   E - sepal
   F - stamen
   G - stigma

   [Diagram of a flower with labels A, B, C, D, E, F, G]
Directions: Match each flower part to its description.

15. __B__ ovary  
   A. the part of the flower where pollen is made

16. __F__ petal  
   B. the bottom part of the pistil, which holds the ovule(s)

17. __D__ pistil  
   C. the sticky top part of the pistil that receives pollen

18. __E__ sepal  
   D. the structure in the center of the flower that receives pollen and produces ovules

19. __A__ stamen  
   E. a small outer leaf that protects the developing flower

20. __C__ stigma  
   F. a brightly colored, modified leaf that attracts pollinators

Directions: Write your answers to the questions below.

21. What must happen in order for a seed to form? Use the following words in your explanation: pollen, stamen, stigma, pistil, and seed.

   In order for a seed to form, a flower must be pollinated. A pollinator has to move pollen from the stamen of one flower to the stigma of another. Then, the pollen grains move through the pistil to the ovules. When that happens, the ovules will develop into seeds.

22. What is one way that a parent plant can disperse its seed(s)?

   Wind, water, by animals, etc.

23. A seed contains stored food and an ______ embryo _______, which will grow into a plant if the seed germinates.

24. Name a type of plant that produces spores: __a fern, moss, etc._________

25. A plant that is inactive is called ________ dormant ____________.

26. Give an example of a plant adaptation.

   Sample answer: Plants go dormant in the winter. They stay inactive until spring, when the temperature rises again. This adaptation helps them survive during cold temperatures.
Thank you for purchasing this Plant Anatomy & Life Processes Study Guide and Review Worksheet! I hope that you find this to be a useful resource.

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