**Plants Test Study Guide Answer Key**

**A proficient student can summarize the basic structures and functions of flowering plants required for survival, reproduction and defense**

**1. Why do plants have flowers?**

The purpose of flowers is to help the plant reproduce through pollination and fertilization.

**2. What are the function and locations of the following terms:**

**a. Phloem**- Tube-like tissue in the stem of a plant that carries sugar from the leaves to the rest of the plant.

**b. Xylem-** Tube-like tissue in the stems of plants that carries water and nutrients from the roots to the rest of the plant

**c. Petal-** Usually colored parts of plant surrounding the center of a flower that helps to attract and direct pollinators to the nectar in the flower so that they will pollinate the flower

**d. Sepal**- Modified leaves usually found at the base of a flower that protect the flower before it blooms

**e. Pistil-** Term for the complete female part of the flower consisting of the, ovary, style, and stigma

**f. Ovary-** Located at the base of the flower below the style, the ovary produces ovules and holds seeds after fertilization. In many plants, the ovary becomes a fruit which protects the seeds and helps disperse the seeds as animals eat the fruit

**g. Ovule-** Located inside the ovary, the female sex cell of a plant, once fertilized, it will become the seed.

**h. Style-** Located above the ovary and below the stigma, it allows the pollen tube from the stigma to connect to the ovule in the ovary and also holds the stigma up in the air to increase the chance of fertilization.

 **i. Stigma-** Located on top of the style, the stigma collects pollen grains from pollinators visiting the flower.

 **j. Stamen-** The complete male part of the flower, consisting of the filament and anther

**k. Filament-** The long stem that holds the anther up away from the base of the flower to help pollen attach to pollinators

**l. Anther-** located on top of the filament, the anther produces and holds pollen grains that will be spread by pollinators

 **m. Pollen-** Made and stored in the anther, the male sex cell of a plant

**n. Leaves-** Located on branches and stems, leaves contain chlorophyll and carry out the process of photosynthesis.

**o. Roots-** Located in the ground below and around a plant, holds the plant in place, draws nutrients and water from the ground, and stores food for the plant

**p. Stem-** Holds the plant upright and allows for easier access to sun for photosynthesis and pollinators for pollination

**q. Stomata-** Located on the leaves, tiny holes on the underside of leaves that allow for the intake of CO2 and release of Oxygen and water

**3. What is the difference between a perfect and an imperfect flower?**

Perfect flowers have both male and female reproductive parts while imperfect flowers have only one.

**4. Describe the process of pollination and explain why it is important**.

Pollination occurs when wind, water, bird, insect, bat, etc, moves pollen from an anther to a stigma. It is important because it is necessary for reproduction of most plant species

**5. Describe the process of fertilization and explain why it is important.**

Fertilization occurs when pollen that has been collected by the stigma of a flower grows a tube down to the ovary of the flower and connects to an ovule. The fertilized ovule will then become a seed. It is important because it is a vital process of sexual reproduction of the plant.

**A proficient student can explain the processes of photosynthesis, respiration, and transpiration to the survival of green plants and other organisms.**

1. **Explain the process of photosynthesis and why it is important.**

Photosynthesis is the process by which plants use water (H2O) and Carbon Dioxide (CO2) in the presence of sunlight to produce glucose (C6H12O6) and Oxygen O2. It is important because it is how energy from the sun is turned into energy that all living things can use.

1. **Where does photosynthesis occur?**

Photosynthesis occurs in the chloroplasts of plant cells in the leaves.

**3. What is the chemical equation for photosynthesis?**

6CO2 + 6H2O -> C6H12O6 + 6O2

**4. Explain the process of cellular respiration and why it is important?**

Cellular respiration is the process by which living organisms use glucose and Oxygen to produce energy, Carbon Dioxide and water. It is important because it is how living organisms turn sugars into the energy needed for life processes.

**5. What is the chemical equation for cellular respiration?**

C6H12O6 + 6O2 -> 6CO2 + 6H2O + Energy

**6. Where does cellular respiration occur?**

Cellular Respiration occurs in the mitochondria of cells

**7. How are the processes of photosynthesis and cellular respiration related?**

Photosynthesis and cellular respiration are complimentary processes meaning that the products of one are the reactants of the other.

**8. Explain the process of transpiration and why it is important.**

Transpiration is the process by which leaves of plants release water into the atmosphere. It is important because it pulls water from the roots to the leaves of the plant for photosynthesis, and it cools the plant

**9. Why is transpiration important to plants?**

Transpiration is important specifically to plants pulls water up from the roots to the rest of the plant as water is evaporated out of the leaves. It also cools the plant

**A proficient student can Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in the environment.**

**1. What is a stimulus?**

An event, organism, or condition that causes a response in an organism

**2. Define dormancy?**

Period of inactivity where organism doesn’t grow or develop temporarily

**3. Why is dormancy important to plants?**

Protects plants from adverse conditions

**4. What is tropism?** a biological phenomenon, indicating growth or turning movement a plant makes in response to an environmental stimulus

**5. What is the difference between a negative and a positive tropism?**

Positive tropisms cause the plant to move towards the stimulus

Negative tropism cause the plant to move away from the stimulus

**6. Define the following terms:**

 a. **thigmotropism**- tropism in response to touch

 b. **phototropism**- tropism in response to light

 c. **geotropism**- tropism in response to the earth (gravity) also called gravitropism

 d. **gravitropism**- tropism in response to gravity

 e. **hydrotropism**- tropism in response to water

 f. **heliotropism**- tropism in response to the path of the sun