

REPRODUCTION IN PLANTS (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)**Multiple Choice Questions**

1. c) Protecting the flower in its bud stage.

Sepals are the green, leaf-like structures that encase and protect the developing flower before it blooms.

2. c) Petals.

Petals are often brightly colored and can have various shapes and scents, making them key to attracting insects and other pollinators.

3. c) Filament and anther.

The filament is the stalk that supports the anther, which is where pollen is produced.

4. c) Style.

The style is the slender stalk that supports the stigma and connects it to the ovary below.

5. b) Anther.

The anther is located at the top of the stamen and is where pollen is produced and stored.

6. c) Attracting pollinators.

Petals are often brightly colored and fragrant, helping to draw in insects and other animals that aid in pollination.

ADVANCED LEVEL**More than One Answer Type**

7. c) Stamens, d) Pistil (or Carpel)

The parts of a flower involved in the reproductive process are c) Stamens and d) Pistil (or Carpel). The stamens produce pollen (male reproductive cells), while the pistil contains the ovary, where ovules (female reproductive cells) are located. Both are essential for fertilization and reproduc-

tion in flowering plants.

8. a) Sepals, d) Ovules

The flower part(s) that are not involved in attracting pollinators are a) Sepals and d) Ovules. Sepals primarily protect the flower bud, while ovules are involved in reproduction but do not play a role in attracting pollinators.

Fill In the Blanks

9. Petals

10. Sepals

Matching Type

11.

1. Sepals - C. These are the outermost parts of the flower, usually green in color, and protect the flower in its bud stage.

2. Petals - A. The most noticeable part of the flower, they attract pollinators with their colors, shapes, and fragrances, and protect the reproductive organs.

3. Stamens - B. The male reproduction organs of the flower, consisting of a filament and an anther where pollen grains are produced.

Answer the Following Questions

12. The main function of sepals in a flower is to protect the flower in its bud stage. They encase and shield the developing flower before it blooms, helping to prevent damage from environmental factors.

13. The two main parts of a stamen are:

1. Anther: This is the pollen-producing part of the stamen. It contains pollen sacs where pollen grains are formed and stored. When the pollen matures, it is released and can be transferred to the stigma of a flower, facilitating pollination.

2. Filament: This is the slender stalk that supports the anther. It elevates the anther, positioning it to effectively release pollen into the air or onto pollinators, increasing the chances of successful fertilization. Together, these parts play a crucial role in the reproductive process of flowering plants.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)**Multiple Choice Questions**

1. c) Pistil.

The pistil consists of the stigma, style, and ovary, where ovules are located and fertilization occurs.

2. b) Receiving pollen grains.

The stigma is the sticky top part of the pistil that captures and holds pollen for fertilization.

3. c) Ovary.

The ovary houses the ovules, which can develop into seeds after fertilization.

4. c) A fruit.

The fruit contains the seeds, which are the fertilized ovules.

5. c) Ovules.

These are the structures that, once fertilized, develop into seeds.

ADVANCED LEVEL**More than One Answer Type**

6. a) Sepals: Sepals are the outermost parts of the flower and often serve to protect the flower bud before it opens. They encase the reproductive structures and provide a layer of protection from environmental factors and potential damage.

b) Petals: While the primary role of petals is to attract pollinators, they also provide some protection to the reproductive organs (stamens and pistil) within the flower. By surrounding these parts, petals help shield them from harsh conditions and herbivores.

d) Ovary: The ovary itself is part of the pistil and contains the ovules. It protects the ovules (female gametes) and plays a crucial role in fertilization and seed development.

7. The part of the flower that develops into a fruit after fertilization is c)

Ovary.

In this case, none of the other options (a) Filament, (b) Stigma, or (d) Style develop into fruit. Only the ovary matures into the fruit that houses the seeds. So, the correct answer remains solely c) Ovary.

Fill In the Blanks

8. Stamens

9. The pistil, or carpel, is the female reproductive organ of the flower, comprising three main parts which are:

1. Stigma: The sticky top part that receives pollen.
2. Style: The slender stalk that connects the stigma to the ovary.
3. Ovary: The swollen base that contains ovules and develops into the fruit after fertilization.

Matching Type

10.

1. Pistil - C. The female reproductive organs, consisting of the stigma, style, and ovary.
2. Ovary - A. The swollen base of the pistil where ovules are produced and which develops into a fruit after fertilization.
3. Ovules - B. Female reproductive cells contained within the ovary that develop into seeds if fertilized.

Answer the Following Questions

11. The pistil, or carpel, consists of three main components, each with specific functions:

1. Stigma:

- Function: The stigma is the sticky surface at the top of the pistil that receives pollen during pollination. Its sticky texture helps to capture pollen grains for fertilization.

2. Style:

- Function: The style is the slender stalk that connects the stigma to the ovary. It serves as a pathway for pollen tubes to grow down toward the ovary after pollination, allowing for fertilization of the ovules.

3. Ovary:

- Function: The ovary is the swollen base of the pistil that contains the ovules (female gametes). After fertilization, the ovary develops into the fruit, which encases the seeds formed from the fertilized ovules.

Together, these components play essential roles in the reproductive process of flowering plants.

12. The filament and the anther in a stamen have a close functional relationship:

1. Filament: This is the slender stalk that supports the anther. It elevates the anther to a position where it can effectively release pollen, either into the air or onto visiting pollinators.

2. Anther: This is the pollen-producing part of the stamen, containing pollen sacs where pollen grains are formed and stored.

The filament ensures that the anther is positioned optimally for pollen dispersal, facilitating the process of pollination and increasing the chances of successful fertilization in the flower. Together, they form the male reproductive structure of the flower, working in tandem to produce and distribute pollen.

POLLINATION AND FRUIT FORMATION (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. b) To produce seeds for growing new plants.

Pollination is the process that allows for the transfer of pollen from the male part of a flower to the female part, leading to fertilization and the formation of seeds.

2. c) Stigma.

The stigma is the part of the flower that receives the pollen, allowing for fertilization to occur.

3. a) It carries pollen from one flower to another.

Wind pollination, or anemophily, allows pollen grains to be dispersed through the air to reach the stigma of other flowers, facilitating fertilization.

4. b) The pollen travels down to the ovary.

This process involves the growth of a pollen tube, which allows the sperm cells to move down into the ovary for fertilization of the ovules.

5. b) grows and changes into a fruit.

The ovary matures to encase the seeds that develop from the fertilized ovules, forming the fruit that protects and helps disperse the seeds.

ADVANCED LEVEL

More than One Answer Type

6. a) It involves moving pollen from one part of the flower to another. (This includes moving pollen from the anther to the stigma within the same flower or to another flower.)

b) It is necessary for plants to make seeds. (Pollination is essential for fertilization, which leads to seed formation.)

d) It can occur through wind and water. (Pollination can occur via various methods, including wind and water, in addition to insects and other animals.)

7. B) Pollen travels down to the ovary. (After pollination, a pollen tube forms and grows down through the style to the ovary.)

D) Fertilization occurs when pollen meets an ovule. (Once the pollen reaches the ovary, fertilization happens when the sperm cells unite with the ovules.)

Fill In the Blanks

8. Anther

9. ovules

Matching Type

10.

1. Pollination - C. A process that involves moving pollen from one part of the flower to another to make seeds.

2. Pollen - D. Tiny powdery substance that needs to be moved for plants to make seeds, style, and ovary.
3. Anther - B. This is where the pollen comes from, part of the flower's male part.
4. Stigma - A. The sticky part where pollen needs to go.

Answer the Following Questions

11. The anther is the part of the stamen, which is the male reproductive organ of a flower. It is typically a small, lobed structure that produces and contains pollen grains.

Role in Pollination:

1. Pollen Production: The primary function of the anther is to produce pollen, which contains the male gametes (sperm cells) necessary for fertilization.
2. Pollen Release: When the pollen grains mature, the anther releases them. This can occur through various mechanisms, such as wind or physical contact with pollinators (like insects).
3. Facilitating Transfer: The pollen must then be transferred to the stigma of the same flower or another flower of the same species for successful pollination, which is essential for fertilization and the subsequent production of seeds.

In summary, the anther plays a crucial role in the reproductive process by producing and distributing pollen, enabling the fertilization of ovules in the ovary.

12. When pollen moves from the anther to the stigma, several important processes occur:

1. Pollination: This initial transfer of pollen is called pollination. The pollen grains adhere to the sticky surface of the stigma.
2. Pollen Germination: Once on the stigma, if conditions are favorable (such as moisture), the pollen grain begins to germinate. It absorbs water and swells.
3. Pollen Tube Formation: The pollen grain develops a pollen tube that grows down through the style toward the ovary. This tube carries the sperm cells from the pollen.

4. Fertilization: When the pollen tube reaches the ovary, it penetrates an ovule. The sperm cells travel through the tube, and one sperm cell fertilizes the egg cell within the ovule, leading to the formation of a zygote. The other sperm cell may fuse with other cells to form endosperm, which nourishes the developing embryo.

This entire process is crucial for the production of seeds and the continuation of the plant species.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. b) Anther.

The anther is located at the tip of the stamen and is responsible for generating and releasing pollen grains.

2. b) By drinking nectar and transferring pollen.

As they collect nectar for food, their bodies come into contact with the pollen, which they then carry to other flowers, facilitating the transfer of pollen from one flower to the stigma of another, aiding in fertilization.

3. c) Water

4. b) When the pollen and ovule join together.

This process occurs after pollination, when the sperm cells from the pollen unite with the egg cell in the ovule, leading to the formation of a zygote.

5. b) turns into a seed.

The fertilized ovule develops into a seed, which contains the embryo and is protected by the ovary as it matures into a fruit.

ADVANCED LEVEL

More than One Answer Type

6. a) Anther: This is where pollen is produced and released.

b) Stigma: This is the sticky surface that receives the pollen during polli-

nation.

7. a) The ovules turn into seeds after fertilization. , c) The ovary starts to grow and change into a fruit.

Fill In the Blanks

8. Stigma

9. Seed

Matching Type

10.

1. Fertilization - C. The union of pollen and an ovule.

2. Seed Formation - A. Each ovule turns into this after fertilization.

3. Fruit Formation - D. The ovary starts to grow and change into this to protect the seeds.

4. Seed Dispersal - B. The process by which seeds are spread to new places.

Answer the Following Questions

11. The stigma is the sticky, receptive part of the pistil (the female reproductive organ of a flower) that is located at the top of the style.

Importance in Pollination:

1. Pollen Reception: The stigma's primary role is to receive pollen grains during the process of pollination. Its sticky surface helps capture and hold the pollen, ensuring that it stays in place for germination.

2. Initiating Fertilization: Once pollen lands on the stigma, it can germinate and grow a pollen tube down through the style to the ovary. This tube carries sperm cells to the ovule, where fertilization occurs.

3. Species Specificity: The stigma can have different shapes and structures depending on the flower species, which helps ensure that pollen from the same species is effectively captured, promoting successful reproduction.

Overall, the stigma is essential for initiating the reproductive process in flowering plants, making it a critical component of pollination.

12. **Pollination** is the process by which pollen grains are transferred from the male reproductive part of a flower (the anther) to the female reproductive part (the stigma). This transfer can occur within the same flower or between different flowers. Pollination is a crucial step in plant reproduction, as it leads to fertilization, where pollen fuses with ovules to form seeds.

Pollen is a fine, powdery substance produced by the male reproductive organs of flowering plants (specifically, the anthers of stamens). Each pollen grain contains male gametes (sperm cells) and is typically coated in a protective outer layer. Pollen is responsible for the fertilization of ovules in the ovary, enabling the production of seeds and, subsequently, fruit.

In summary, pollination facilitates the movement of pollen, while pollen itself is the carrier of male genetic material necessary for fertilization.

STRUCTURE OF SEED (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. c) Protecting the embryo from harm.

The seed coat serves as a protective outer layer that shields the embryo and stored nutrients from physical damage, dehydration, and pathogens, helping to ensure successful germination and growth.

2. c) Storing food for the embryo. Cotyledons are the first leaves that emerge from a seed and contain stored food reserves that nourish the developing embryo until it can produce its own food through photosynthesis.

3. c) Radicle.

The radicle is the embryonic root that develops and anchors the plant in the soil as it begins to grow.

4. b) Capturing sunlight.

Once the plant has germinated and the leaves emerge, they begin the

process of photosynthesis, allowing the plant to produce energy and grow.

5. c) By having wings or parachutes.

These adaptations allow seeds to be carried away by the wind over distances, helping them to spread and find suitable locations for germination.

6. b) Shooting them from a cannon-like structure to spread their seeds through explosions.

This method involves the seeds being forcibly expelled from their seed pods, often with significant force, allowing them to be spread over a wide area.

ADVANCED LEVEL

More than One Answer Type

7. a) Seed Coat: The protective outer layer that encases the seed.

b) Embryo: The developing plant that will grow into a new plant after germination.

c) Endosperm: The tissue that provides nourishment to the embryo during its early growth.

d) Seed Leaves (Cotyledons): These are the first leaves that provide initial nutrients for the embryo and help in photosynthesis once the plant begins to grow.

8. a) Planting the seed in soil: Provides stability and access to nutrients.

b) Providing warmth: Many seeds require a certain temperature range to germinate effectively.

d) Supplying water: Moisture is crucial for activating the seed's metabolism and allowing it to swell and break through the seed coat.

Fill In the Blanks

9. Endosperm

10. Leaves

Matching Type

11.

1. Seed Coat - B. Protects the tiny baby plant inside from harm.
2. Embryo - C. Contains essential parts such as the root, first leaves, and stem.
3. Endosperm - A. Stores all the food the baby plant needs to start growing.
4. Seed Leaves - D. Provides the initial nutrients to kickstart growth until the plant can produce its food.

Answer the Following Questions

12. The essential parts contained within the embryo of a seed include:

1. Radicle: This is the embryonic root that will develop into the primary root of the plant.
2. Plumule: This is the embryonic shoot that will grow into the stem and leaves of the plant.
3. Cotyledons (Seed Leaves): These are the first leaves that will emerge from the seed, often providing initial nutrients to the developing plant before it can photosynthesize.

Together, these parts work to ensure the seed can grow into a healthy plant after germination.

13. During germination, roots and shoots play crucial but distinct roles:

Roots:

1. Anchorage: The radicle (embryonic root) grows downward into the soil, anchoring the seedling in place.
2. Water and Nutrient Absorption: Roots are responsible for absorbing water and essential nutrients from the soil, which are critical for the plant's growth and development.
3. Storage: In some plants, roots may also store food reserves that can be used by the plant as it grows.

Shoots:

1. **Growth and Development:** The plumule (embryonic shoot) grows upward, pushing through the soil to reach the surface.
2. **Photosynthesis:** Once the shoot emerges and develops leaves, it can begin photosynthesis, producing food for the plant and allowing it to grow independently.
3. **Stem Formation:** The shoot develops into the stem, which supports the plant and transports nutrients and water between the roots and leaves.

Together, roots and shoots ensure that the seedling is anchored, nourished, and able to grow effectively as it transitions from a dependent embryo to an independent plant.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)**Multiple Choice Questions**

1. c) Endosperm.

The endosperm provides essential nutrients that support the growth of the embryo until it can begin photosynthesis and produce its own food.

2. a) Root, stem, and leaves.

The embryo includes the radicle (root), plumule (stem), and cotyledons (seed leaves).

3. c) Photosynthesis.

Once the shoot emerges and leaves develop, the plant can capture sunlight and produce food through photosynthesis.

4. b) Offering a cozy home for the seed.

Soil provides stability, support, and a suitable environment for the seed to absorb water and nutrients necessary for germination and growth.

5. c) By floating on water.

Many seeds have adaptations that allow them to float, which enables them to be carried away by water currents to new locations.

ADVANCED LEVEL**More than One Answer Type**

6. c) Endosperm: This provides essential nutrients for the embryo.

d) Seed Leaves (Cotyledons): These also store food and provide initial nutrients for the embryo as it begins to grow.

7. The plant structures that are not involved in the process of capturing sunlight and converting it into food are a) Roots. While roots play essential roles in anchoring the plant and absorbing water and nutrients, they do not participate in photosynthesis. The structures primarily responsible for capturing sunlight and converting it into food are b) Shoots and c) Leaves. d) Flowers are involved in reproduction but not directly in photosynthesis.

Fill In the Blanks

8. Seed coat

Matching Type

9.

1. Planting the seed - C. Begins the process by providing a suitable environment for seed growth.

2. Water - A. Softens the seed and initiates the germination process.

3. Warmth - D. Wakes up the seed and signals the start of growth.

4. Roots and Shoots - B. Formation of root (radicle) and shoot (plumule) to absorb water, nutrients, and sunlight.

Answer the Following Questions

10. Seed leaves, or cotyledons, support the initial growth of the baby plant in several ways:

1. Nutrient Storage: Cotyledons store essential nutrients that are available to the embryo as it begins to grow. This provides the energy necessary for early development before the plant can produce its own food.

2. Photosynthesis: In many plants, cotyledons can perform photosynthesis once they emerge, contributing to the plant's energy needs and helping it establish itself.

3. Support: Cotyledons often help to support the young plant as it emerges from the soil, providing structural stability during the early stages of growth.

4. Transition: They serve as the first leaves of the plant, facilitating the transition from reliance on stored food to producing energy through photosynthesis as the true leaves develop.

Overall, cotyledons play a critical role in ensuring that the baby plant has the resources it needs to establish itself and grow.

11. Water contributes to the germination process in several essential ways:

1. Activation of Metabolism: Water is crucial for reactivating the metabolic processes within the seed. It helps enzymes become active, facilitating the chemical reactions necessary for germination.

2. Soaking and Swelling: When seeds absorb water, they swell and break through the seed coat. This swelling initiates the growth of the embryo, pushing the radicle (root) and plumule (shoot) out.

3. Nutrient Mobilization: Water helps dissolve nutrients in the surrounding soil, making them available for absorption by the developing roots. This is vital for the plant's growth.

4. Transport: Water serves as a medium for transporting nutrients and minerals from the soil to the seedling, supporting its development.

5. Maintaining Turgor Pressure: Water maintains turgor pressure within the plant cells, which is important for cell expansion and overall plant structure as it grows.

In summary, water is a key factor in initiating and sustaining the germination process, enabling the seed to transition from dormancy to active growth.