REPRODUCTION IN PLANTS (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. c) Soil
Soil is NOT a method of seed dispersal. Seed dispersal methods include wind, water, and animals.

2. c) Lightweight with structures to catch the wind.
Seeds dispersed by wind are typically designed to be light and may have wings or other adaptations that help them float and travel through the air.

3. c) Bird.
Birds are commonly involved in endozoochory, where they consume fruits and then disperse the seeds through their droppings.

4. b) Explosive dispersal.
This method involves the sudden release of seeds from a pod or capsule, often resulting in seeds being ejected away from the parent plant.

5. c) Adequate moisture, warmth, and oxygen.
These conditions are essential for triggering seed germination.

ADVANCED LEVEL

More than One Answer Type

6. The methods of seed dispersal from your options are:
a) Wind, c) Gravity. Sunlight is not a method of seed dispersal.

7. Seeds benefit from being dispersed to new locations by: a) Avoiding competition with parent plants, c) Colonizing new habitats.
Ensuring reproduction in the same area and attracting predators for protection are not benefits of seed dispersal.

Fill In the Blanks

8. Skin.
9. Capsule.

Matching Type

10.

A. Wind dispersal - 4. Seeds are carried away from the parent plant by air currents.

B. Water dispersal - 3. Seeds are transported by rivers, streams, or ocean currents.

C. Animal dispersal (endozoochory) - 1. Seeds are eaten by animals and later excreted in new locations.

D. Gravity dispersal - 2. Seeds fall to the ground near the parent plant and may roll away.

Answer the Following Questions

11. Three different ways seeds can be dispersed in nature are:

1. Wind Dispersal: Seeds are carried away from the parent plant by air currents, often aided by lightweight structures like wings or tufts.

2. Animal Dispersal (Endozoochory): Seeds are eaten by animals and later excreted in new locations, helping to spread them over a wider area.

3. Water Dispersal: Seeds are transported by rivers, streams, or ocean currents, allowing them to reach distant shores and new habitats.

12. Wind helps in the dispersal of seeds by carrying lightweight seeds away from the parent plant, allowing them to land in new locations where they can germinate without competing with the parent. This method can cover long distances, which is beneficial for species that need to spread out.
An example of a plant that uses wind dispersal is the dandelion. Its seeds have fluffy, parachute-like structures that enable them to be easily carried by the wind.

13. Water aids in the dispersal of seeds by transporting them along rivers, streams, or ocean currents. This allows seeds to reach new habitats that may be far from the parent plant, often leading to successful colonization in suitable environments.

An example of a plant that uses water dispersal is the **coconut**. Coconuts can float on water, allowing them to travel across oceans and germinate on distant shores.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. d) Helping seeds reach new locations to grow into plants.
The primary purpose of seed dispersal is to enable seeds to find suitable environments for germination and growth, reducing competition with the parent plant.

2. c) Animal dispersal (endozoochory).
This type of seed dispersal involves animals eating fruits and then dispersing the seeds in their droppings.

3. c) Explosive dispersal
is NOT a method of seed dispersal by animals. Explosive dispersal refers to the mechanism where seeds are ejected from a pod or capsule, not involving animals.

4. c) Animal dispersal (epizoochory).
This method involves seeds attaching to the fur or feathers of animals for transport to new locations.

5. c) Absorption of water.
The absorption of water triggers the cracking open of a seed during germination, starting the process of growth.

ADVANCED LEVEL

More than One Answer Type

6. Seeds get dispersed by animals in the following ways:

a) Through ingestion and excretion, b) Attachment to fur or feathers

,c) Carrying in their mouths

d) Shooting out of pods is not a method of animal dispersal; it refers to explosive dispersal.

7. The environmental factors that can trigger seed germination are: a) Adequate moisture, b) Sunlight, d) Warmth
Freezing temperatures would not trigger germination; in fact, they can inhibit it.

Fill In the Blanks
8. Seed dispersal
9. wind
10. Gravity

Matching Type
11.

A. Germination - 2. The process of the seed absorbing water, swelling, and the embryo inside starting to grow.

B. Seed dispersal - 1. The process by which seeds are spread or moved away from the parent plant to new locations.

C. Wind Dispersal - 4. dandelion seeds or maple seeds.

D. Epizoochory - 3. Seeds can also attach to the fur, feathers, or skin of animals and be carried to new locations.

Answer the Following Questions
12. If I were a seed, I would want to be dispersed by animals through ingestion and excretion. This method would allow me to travel further away from the parent plant, reducing competition for resources. Plus, being carried to new locations means I'd have a better chance of landing in a suitable environment with good soil and moisture for germination. Plus, the journey could be quite an adventure!

13. Dispersing seeds away from the parent plant is important for several reasons:

1. Reduced Competition: By moving away, seeds can avoid competing with the parent plant and its offspring for resources like water, sunlight, and nutrients.2. Colonization of New Areas: Dispersal allows plants to

establish in new habitats, increasing their chances of survival and thriving in diverse environments.

3. Genetic Diversity: When seeds spread over a wider area, it promotes genetic diversity, which can enhance resilience to pests, diseases, and changing environmental conditions.

4. Avoiding Predation: If seeds remain close to the parent plant, they may be more susceptible to predators. Dispersal can help them escape from areas with high predation pressure.

Overall, effective seed dispersal is crucial for the survival and success of plant species.

14. Fruits play a crucial role in seed dispersal by animals in several ways:

1. Attraction: Fruits often have bright colors, appealing scents, and sweet flavors that attract animals, encouraging them to consume the fruit.

2. Protection: The fruit protects the seeds inside as they are eaten and transported, ensuring that they remain intact until they are excreted or discarded.

3. Nutritional Reward: By providing a nutritious food source, fruits incentivize animals to eat them, facilitating the dispersal of the seeds contained within.

4. Facilitation of Germination: After being eaten, some seeds can benefit from passing through the digestive system of animals, which can help break down seed coats and stimulate germination.

In summary, fruits enhance the likelihood of seeds being dispersed effectively, ensuring the survival and propagation of plant species.

VEGETATIVE PROPOGATION (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. B) To create new plants.
The main purpose of using cuttings in vegetative propagation is to produce new plants that are genetically identical to the parent plant.

2. A) Scion, rootstock.
In grafting, the upper part of one plant (the scion) is joined with the rooted part of another plant (the rootstock).

3. D) Encouraging roots to grow while still attached to the parent plant.
Layering involves bending a stem to the ground and covering part of it with soil to promote root growth while it remains connected to the parent plant.

4. B) A method where plants create new plants from their roots.
Reproduction from roots involves the development of new plants from the root system of an existing plant.

5. B) Potato.
Potatoes reproduce from tubers, which are specialized structures that develop from their root system.

6. B) Strawberry.
Strawberries reproduce from runners, which are horizontal stems that can root and develop into new plants.

7. D) Producing new stems and roots. In some plants, leaves can develop into new plants by producing stems and roots, enabling vegetative propagation.

ADVANCED LEVEL

More than One Answer Type

8. The essential components of a grafted plant are: A) Scion, B) Rootstock.
While grafting tape can be helpful for securing the graft, it is not essential to the grafted plant itself.

9. A) Stem and D) Node.
In the layering process, a stem is typically bent to the ground, and a

node (where leaves attach) is buried in soil to encourage root growth while still attached to the parent plant.

Fill In the Blanks

10. Roots
11. Seeds

Matching Type

12.

1. Reproduction from roots - C. Growth of new plants from specialized roots that grow from the main root.

2. Reproduction from stems - A. Involves burying a portion of the stem in soil to encourage root growth.

3. Reproduction from leaves - B. Development of new plants from leaves or leaf parts.

Answer the Following Questions

13. Cutting: Cutting is a method of vegetative propagation where a portion of a plant—usually a stem, leaf, or root—is removed and encouraged to grow into a new plant. The cut part is placed in a suitable medium, such as soil or water, where it develops roots and eventually establishes itself as a new plant. This method is widely used for many houseplants and shrubs because it is simple and can produce genetically identical offspring.

Grafting: Grafting involves joining the upper part of one plant, known as the scion, with the lower part of another plant, called the rootstock. This technique is often used to combine desirable traits from two different plants, such as disease resistance from the rootstock and fruit quality from the scion. Grafting is commonly used in fruit tree cultivation and in creating ornamental plants. Proper alignment of the vascular tissues is crucial for the success of grafting.

Layering: Layering is a propagation method that involves bending a stem of a plant to the ground and burying a part of it, allowing it to root while still attached to the parent plant. Once roots develop, the new plant can be separated from the parent. There are several types of layering, including mound layering (or stool layering) and air layering. This method is

effective for many woody plants and ensures that the new plant has a strong root system from the start.

Summary

- Cutting: Involves removing a part of a plant to grow a new one.

- Grafting: Joins parts of two plants to combine desirable traits.

- Layering: Encourages roots to form on a stem while still attached to the parent plant.

All these methods allow for the propagation of plants without the use of seeds, providing a way to maintain genetic consistency and enhance specific plant characteristics.

14. Reproduction from Leaves

Reproduction from leaves is a form of vegetative propagation where new plants develop from leaf structures or parts of leaves. This method allows plants to reproduce asexually, creating genetically identical offspring without the need for seeds. Here are some key aspects of this process:

1. Types of Leaf Propagation

- Leaf Cuttings: In some plants, a leaf can be cut and placed in soil or water. For example, certain succulents like African violets can produce new plants from leaf cuttings. The leaf develops roots and eventually forms a new plant.

- Leaf Budding: Some plants can produce new shoots from the buds located on the leaf petiole (the stalk that attaches the leaf to the stem). These buds can grow into new plants when planted.

- Adventitious Shoots: In some species, new shoots can emerge from the leaf base or along the leaf margin. Kalanchoe is an example, where small plantlets form along the edges of the leaves.

2. Benefits

- Genetic Uniformity: Since the new plants are clones of the parent, they maintain desirable traits.

- Adaptability: This method allows plants to quickly occupy new areas, helping them survive and thrive in various environments.

3. Examples of Plants

- Bryophyllum (Mother of Thousands): This plant produces tiny plantlets along the edges of its leaves.

- Sedum: Many varieties can be propagated from leaf cuttings.

- Jade Plant (Crassula): Leaves can be used to grow new plants through cutting and rooting.

4. Process

1. Selection: Choose healthy leaves or leaf sections.

2. Preparation: Cut the leaves, if necessary, and allow them to callous over to prevent rot.

3. Planting: Place the leaves in a suitable growing medium, ensuring proper moisture.

4. Root Development: Over time, roots and new shoots will develop from the leaf.

Conclusion

Reproduction from leaves is a fascinating and effective method of vegetative propagation that enables plants to reproduce without seeds. It provides a reliable way to produce new plants that are genetically identical to the parent, ensuring the preservation of desirable traits.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. A) Flower.
The flower is not typically used in a cutting for vegetative propagation. Cuttings usually involve stems, leaves, or roots.

2. C) Grafting.
The process of joining the scion and stock together is called grafting.

3. C) Stem.
The stem is typically used in layering, where a portion of it is buried in soil to encourage root growth while still attached to the parent plant.

4. C) Carrot.
Carrots commonly reproduce from their roots, as they develop new plants from the taproot system.

5. B) A method where plants create new plants from their stems.
Reproduction from stems involves using parts of the stem to propagate new plants, often through methods like cuttings or layering.

6. B) Begonia.
Begonias commonly reproduce from leaves, as new plants can develop from leaf cuttings or from leaf sections.

ADVANCED LEVEL

More than One Answer Type

7. A) Stem.
While leaves and roots can also be used for propagation in some cases, stems are the most commonly used plant parts for making cuttings.

8. A) Cuttings, B) Grafting, C) Layering.
All three options—cuttings, grafting, and layering—are commonly used methods of vegetative propagation.

Fill In the Blanks

9. Nodes
10. Scion

Matching Type

11.

1. Cutting - B. A method where a portion of the plant is severed and used to grow a new plant.

2. Grafting - C. A technique where a scion from one plant is attached to the rootstock of another plant.

3. Layering - A. A propagation method where a stem is encouraged to form roots while still attached to the parent.

Answer the Following Questions

12. Reproduction from Stems

Reproduction from stems is a form of vegetative propagation where new plants develop from the stem structures of an existing plant. This method allows plants to reproduce asexually, creating genetically identical offspring without the need for seeds. Here are the key aspects of reproduction from stems:

1. Methods of Stem Propagation

- Cuttings: A section of the stem is cut and placed in soil or water to encourage root formation. This is commonly used for many houseplants and shrubs. For example, stem cuttings from plants like rose or pothos can develop roots and grow into new plants.

- Layering: In this method, a portion of the stem is bent to the ground and buried in soil, while still attached to the parent plant. Over time, roots develop at the buried section, and the new plant can be separated. Mound layering and air layering are popular techniques used for plants like currants and figs.

- Runners/Stolons: Some plants produce horizontal stems called runners (or stolons) that can root at various points. For example, strawberries produce runners that establish new plants at nodes along the stem.

- Tubers: While not a traditional stem, some plants like **potatoes** have swollen stem structures called tubers that can produce new shoots, leading to the growth of new plants.

2. Benefits of Reproduction from Stems

- Genetic Uniformity: The new plants are clones of the parent, ensuring consistent traits such as flower color, growth habit, or disease resistance.

- Rapid Propagation: This method allows for quick multiplication of desirable plants without waiting for seeds to germinate.

- Survivability: Many plants can adapt to their environment through vegetative propagation, helping them thrive in various conditions.

3. Examples of Plants

- Rose: Stem cuttings are commonly used to propagate roses.

- Cane Plants: Plants like bamboo and sugar cane can reproduce from segments of their stems.

- Strawberry: Uses runners to spread and establish new plants.

4. Process of Stem Cutting

1. Selection: Choose a healthy stem segment from the parent plant.

2. Preparation: Cut the stem just below a node (where leaves attach) and allow it to callous if needed.

3. Planting: Place the cutting in a suitable medium (soil or water).

4. Care: Provide moisture and appropriate conditions for rooting, such as warmth and humidity.

5. Root Development: Once roots form, the new plant can be potted or planted in the garden.

13. Reproduction from Roots

1. Definition: A form of vegetative propagation where new plants develop from the root system of an existing plant.

2. Methods:

- Root Cuttings: Sections of roots are cut and planted to grow new plants (e.g., blackberries).

- Adventitious Roots: New shoots develop from roots, as seen in dandelions.

- Tubers: Swollen roots, like potatoes, sprout new shoots.

- Rhizomes: Horizontal underground stems (e.g., ginger) produce roots and shoots.

3. Benefits:

- Genetic Consistency: New plants are clones of the parent.

- Adaptability: Helps plants occupy new areas.

- Resource Efficiency: Utilizes existing resources without seed production.

4. Examples:

- Carrot: New plants can grow from the taproot.

- Sweet Potato: Reproduces from root sections.

- Clover: Forms new clumps from the root system.

5. Process:

- Select healthy roots.
- Cut roots into sections.
- Plant in moist soil.
- Care for until new growth appears.