

Class:7	Subject: Science	Topic: Reproduction in Plants
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SUMMARY SHEET		
Learner Previous Knowledge	Reproduction as a characteristic of living things.	
Target Knowledge for this Topic	• Different parts of reproduction in plants • Asexual and sexual reproduction in plants • Formation of seed and fruits • Dispersal of the seed	
Learning Goals		
More Complex Learning Goal- Students will be able to differentiate between unisexual flowers and bisexual flowers and describe the need of different ways of seed dispersal.		
Target Learning Goal- Students will be able to describe asexual and sexual reproduction in plants.		
Simpler Learning Goal- Students will be able to define asexual and sexual reproduction in plants with examples.		
Period No.	Lesson Objectives	Teaching Learning Materials Required
1	• Understand and define vegetative and reproductive parts of a plant • Describe sexual and asexual reproduction.	• Board and markers • Worksheet 1
2	• Understand the vegetative propagation as a type asexual reproduction. • Describe the different methods of vegetative propagation in plants.	• Board and markers • Worksheet 2 • Potato and leaves of Bryophyllum

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3 and 4	• Understand the process of budding • Understand the process of fragmentation • Understand the process of spore formation.	• Board and markers • Worksheet 3 • Yeast powder, water, sugar, test tube, glass slide, bread mold and microscopes.
5	• Understand flower as the reproductive part of the plant. • Understand gametes formation in plants • Describe and differentiate between two ways of pollination	• Board and markers • Worksheet 4
6	• Define and explain fertilization in plants • Understands the formation of seeds and fruit.	• Board and markers • Reference sheet 1
7	• Understand need of seed dispersal • Analyze the different ways of seed dispersal.	• Board and markers • Reference sheet 2

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Lesson Plan 1

Lesson Objectives

At the end of this lesson students will be able to:

- Understand and define vegetative and reproductive parts of a plant
- Describe sexual and asexual reproduction

Teaching Learning Materials required

- Board and markers
- Worksheet 1

Details of Teaching Learning Experience

Seating Arrangement: - Normal

Lesson Beginning <u>Time:</u> 5 min <u>Purpose:</u> • Introduce the topic	• Ask the students to tell about different life process in plants. • Ask them to define reproduction. • Ask the students to tell different parts of a plant. • Ask the students to name some flowering and non-flowering plants. • Collate their responses on the board.
Lesson Middle <u>Time:</u> 25 min <u>Purpose:</u> • Develop conceptual understanding	• Discuss the need of reproduction. • Explain that reproduction is not a life process as it is not necessary for an organism's survival. • Discuss the different type of reproduction. • Explain how a plant can reproduce through its different part. • Ask students to share their experiences of growing plants with different parts of the plants. • Distribute worksheet 1 to students. • Let the students attempt the questions given in worksheet 1. • Discuss the answers of the questions and let them self-assess their worksheet

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Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish up	<u>Finish Up</u> • Clear the doubts if any.
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Worksheet 1

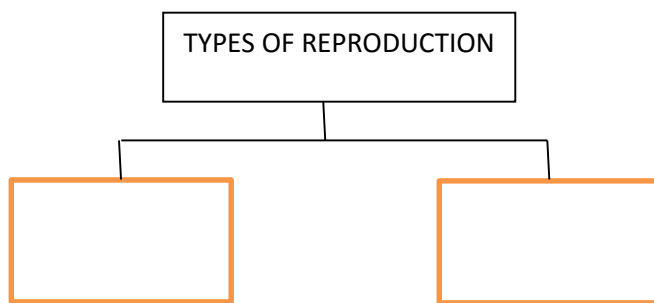
Skill: Comprehension

Q1. Name any three vegetative parts of the plant.

Q2. Name the reproductive part of the plant.

Q3. What do you understand by reproduction?

Q4. Complete the following:



Q5. Give any one advantage of asexual and sexual reproduction.

Q6. Give two differences between sexual and asexual reproduction.

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Lesson Plan 2

Lesson Objectives

At the end of this lesson students will be able to:

- Understand the vegetative propagation as s type of asexual reproduction
- Describe different methods of vegetative propogation.

Teaching Learning Materials required

- Board and markers
- Worksheet 2
- Potato and leaves of Bryophyllum

Details of Teaching Learning Experience

Seating Arrangement: Individual

Lesson Beginning <u>Time:</u> 5 min <u>Purpose:</u> • Activate prior knowledge.	• Ask the following questions: Q1. Reproduction is a process of giving birth to new individual. (T/F) Q2. Name the two types of reproduction. Q3. In which reproduction only one parent is involved? Q4. Can anyone tell how a potato is grown? • Discuss answer with the class. • Make sure that whole class reaches at consensus after discussion.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> • Develop conceptual understanding	• Discuss the name of the topic. Explain the students, as the vegetative parts are involved in this type of asexual reproduction, hence it is called vegetative propagation. • Show them a potato and discuss how the scars present on it helps in reproduction. • Give a Bryophyllum leaf to every student. Ask them to trace the shape of the leaf in their notebook with the help of pencils. • Explain how new buds grow at the margins of the leaf. • Discuss how the other plants like rose, cacti grow through vegetative propagation.

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Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish Up • Home Assignment	Finish Up • Clear doubts any. <u>Home Assignment</u> • Worksheet 2
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Worksheet 2

Skill: Comprehension

Q1. Name different type of natural vegetative propagation methods.

Q2. Complete the following table.

Name of the plant	Vegetative part involved in reproduction
Potato	
Bryophyllum	
Ginger	
Sweet potato	
Onion	

Q3. Explain vegetative propagation in the following plants:

a. Ginger

b. Money Plant

Q4. List advantages of vegetative propagation.

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Period 3 and 4

Lesson Objectives

At the end of this lesson students will be able to:

- Understand the process of budding
- Understand the process of fragmentation
- Understand the process of spore formation

Teaching Learning Materials required

- Board and markers
- Worksheet 3
- Yeast powder, water, sugar, test tube, glass slide, bread mold and microscopes.

Details of Teaching Learning Experience

Seating Arrangement: - Normal

Note for the facilitator – Keep the setup ready for the observation of budding in yeast and spore formation of fungus on the bread piece. (Refer to activity 12.3 and 1.2 of NCERT book)

Lesson Beginning <u>Time:</u> 10 min <u>Purpose:</u> Introduce the topic	• Ask students to state different methods of vegetative reproduction. • Ask them the use of microscope. • Tell them how the cake is baked, using the yeast.
Lesson Middle <u>Time:</u> 50 min. <u>Purpose:</u> • Develop conceptual understanding	• Distribute worksheet 3 to the students. • Instruct them to answer the questions after the discuss of each topic. • Show the formation of new yeast cell under the microscope. • Tell them to observe the slide carefully and discuss their observation among themselves. Let the students do the related questions. • Ask them have they seen green patches at the places where water is collected. If yes, name it in their local language. • Tell them that green patches are form of an algae. • Explain the fragmentation with respect to algae. Let them attempt the related question.

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	• Let them discuss their understanding with the whole class. • Ask the students to observe the slice of bread with fluffy patches under the microscope. • Tell them to observe the slide carefully and discuss their observation among themselves. Let the students do the related questions. • Let them discuss their understanding with whole class.
Lesson End <u>Time:</u> 10 min <u>Purpose:</u> • Finish Up	<u>Finish Up</u> • Clear doubts, if any.

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Worksheet 3

Skill: Comprehension

Q1. Draw the structures formed when yeast starts reproducing.



Q2. What do you understand by buds?

Q3. Explain fragmentation in your own words.

Q4. Name the algae which reproduces through fragmentation.

Q5. Spore formation is a type of asexual reproduction. Why?

Q6. Name two plants which reproduce through spore formation.

Q7. What are spores? How do they withstand unfavourable conditions?

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Period 5

Lesson Objectives

At the end of this lesson students will be able to:

- Understand flower as the reproductive part of the plant
- Understand gametes formation in plants
- Describe and differentiate between two ways of pollination.

Teaching Learning Materials required

- Board and markers
- Worksheet 4

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 or 5 on the school ground

Lesson Beginning <u>Time:</u> 5 min. <u>Purpose:</u> Recap the previous learning	• Ask the students to tell about vegetative and reproductive part of the plants. • Ask students to differentiate between sexual and asexual reproduction. • Draw a flower on the board. • Ask them to recall the different parts of flower they have studied in the previous class.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> Develop conceptual understanding	• Discuss about the female and male reproductive parts of a flower. • Give examples of unisexual and bisexual flowers. • Explain the process of pollination. • Ask them to give importance of pollination. • Collate their responses on the board. • Describe the self and cross pollination to the students. • Ask them to attempt the worksheet 4. • Help the students if required.

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Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish Up	• Clear doubts , if any.
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Worksheet 4

Skill: Comprehension

Q1. Give one example of bisexual and unisexual plants.

Q2. A flower is having both stamen and pistil. Identify the type of flower.

Q3. A unisexual flower cannot self-pollinate. Explain.

Q4. Draw a bisexual flower.

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Period 6

Lesson Objectives

At the end of this lesson students will be able to:

- Define and explain fertilization in plants
- Understand the formation of seeds and fruit

Teaching Learning Materials required

- Board and markers
- Reference sheet 1

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4-5

Lesson Beginning <u>Time:</u> 10 min. <u>Purpose:</u> Develop conceptual understanding	• Ask the students to tell male and female reproductive part of the flower. • Ask them to define pollination. • Ask them to hypothesize what happens when the pollen reaches the stigma of the same/ another flower. • Collate their prediction on the board.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> Develop conceptual understanding	• Discuss the formation of pollen tube with the help of Fig.12.11 of NCERT book. • Explain the process of fertilization to the students. • Ask them to think how the fruits are formed and how they have seeds in them. • Discuss the fruits and seed formation in detail with the help of the reference sheet 1
Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish Up	• Clear doubts, if any

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Reference sheet 1

Fertilization

- Fertilization is the process of fusion of pollen, the male gamete and egg, the female gamete.
- Fertilization results in the formation of a zygote.
- Zygote is one celled stage of an individual which divides to form embryo.

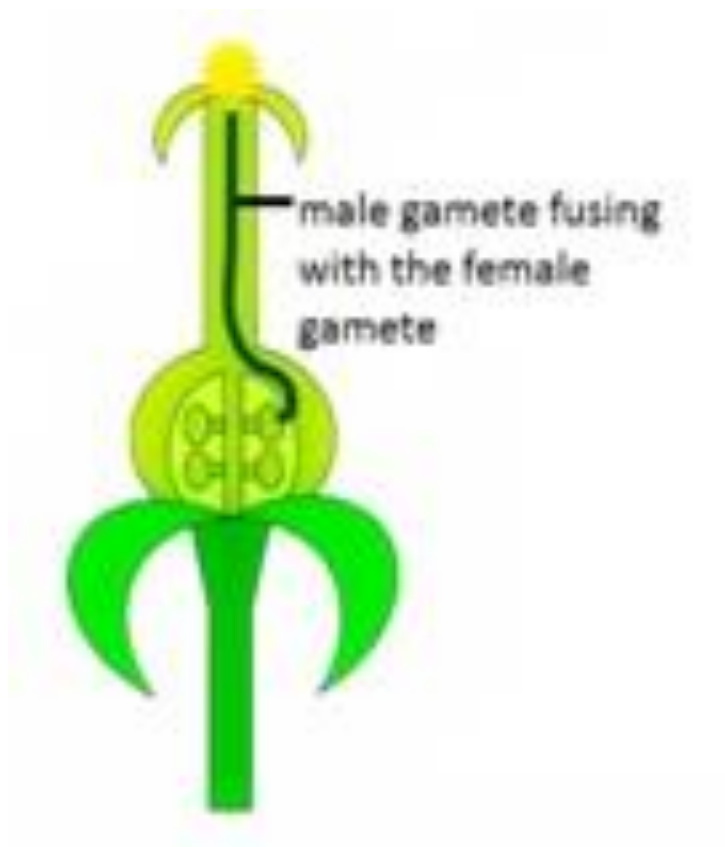


Fig. fertilization

Fruit and seed formation

- After formation of embryo, the parts of the flower fall off except the ovary.
- Ovary ripens into fruits.
- Ovules develop into seeds and seeds contain embryo.
- After formation, different fruits show different features.

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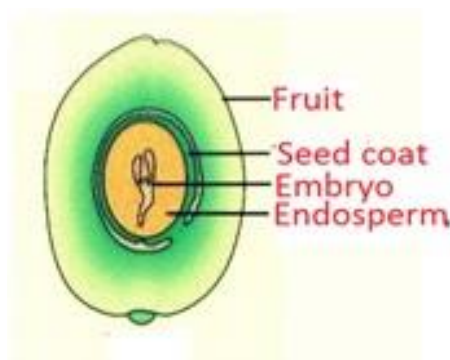


Fig. Fruit and seed formation

For example, mangoes and apples are fleshy and juicy fruits whereas almonds and walnuts are hard fruits.



Fig. Fleshy and juicy mango



Fig. Hard almond

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Period 7

Lesson Objectives

At the end of this lesson students will be able to:

- Understand the need of dispersal of seeds
- Analyze the different ways of seed dispersal

Teaching Learning Materials required

- Board and markers
- Reference sheet 2

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4-5

Lesson Beginning <u>Time:</u> 5 min. <u>Purpose:</u> Develop conceptual understanding	• Ask the students to tell male and female reproductive part of the flower. • Ask them to define pollination • Ask them to tell which part of the flower become fruit and seed. • Discuss their answers in the class.
Lesson Middle <u>Time:</u> 25 min. <u>Purpose:</u> Develop conceptual understanding	• Ask them to hypothesize what will happen if all the seeds are dropped near the parent plant only. • Let them share their opinions. • Ask the students the need of dispersal of seeds. • Ask them to guess the different ways of dispersal of seeds. • Discuss the special features of seeds which help them to disperse with the help of the reference sheet 2
Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish Up	• Clear doubts, if any

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Reference sheet 2

Dispersal of Seeds

If all the seeds were to germinate near the mother plant, the new plants shall not get adequate resources; like sunlight, air and nutrients. For proper growth of the new plants, it is necessary that they develop away from the mother plant. For this, it is necessary that seeds are spread far and wide. The process of spreading seeds to different places is called dispersal of seeds. Many agents of seed dispersal assist the plants in this process.

Dispersal by Wind: Seeds of some plants are light-weight and some hair-like or wing-like structures are present on them. Such seeds float on air and are thus dispersed by wind. Example: Dandelion, maple, drumstick, etc.

Dispersal by Water: Dispersal by water takes place in some aquatic plants and in some which grow near a water body. Seeds of water lily float and thus dispersed by water. The coconut seed has a tough fibrous covering which has plenty of air inside. This helps the coconut seeds in floating on water.

Dispersal by Animals: Some seeds have spine like structures on them. They get stuck to the fur of animals and thus get spread to different places. Examples; Beggar tick, Xanthium, Urena, etc. Some seeds are swallowed by birds and animals along with fruits. These seeds get dispersed with bird or animal droppings.

Dispersal by Bursting: Some fruits burst open when they mature. The force of bursting is enough to spread the seeds. Examples; Ladyfinger, castor, balsam, etc.

Dispersal by Humans: Human beings also help in dispersal of seeds, especially during farming.