EVERSHINE

echo series

FACT FINDER

SCIENCE

Ritu Khati
Ex Principal
Army Public School

PART 5

EVERSHINE PUBLISHERS

SONI HOUSE, WZ-348, Nangal Raya, New Delhi-110046
Phone : 28111758, 28113958, Fax : 28112353
E-Mail : evershinepub@gmail.com

Published by
EVERSHINE PUBLISHERS

PREFACE

The environment around us inspires and integrates all spheres of education with our daily lives. The topics introduced in the books are in harmony with the world around. Science, it is believed, is the perception of the world around us.

This series of science takes the child from rote memory to self learning, making each learning experience unique. It is an attempt to encourage natural curiosity and power of observation.

The series introduces the young learners to the world of science in a simple language and systematic manner. The aim is to ensure that all learners acquire knowledge and understand the subject in a better way. The activities laid out in each book help the students to develop a scientific attitude.

The special features of the series are as follows :

- Use of simple language.
- Theme based study.
- Thinking skills and fun activities.
- Activities for children to enjoy.
- Summary at the end of each chapter for recapitulation.
- Teacher's guidelines for effective teaching.
- Practice model papers at the end of the book.

ABOUT THE AUTHOR

Ms. Ritu Khati is an educationist with an experience of more than thirty years. She has authored and designed several books. She has been actively involved with children instilling in them the ability to reason. She believes in encouraging the children to acquire an inquiring mind, to reflect on their own learning and ideas and to pursue imaginative activities. She treats her students as participants in learning. She is flexible in her thoughts and does not hesitate to implement new ideas and concepts.

She is a thorough professional and creates a positive mark in the life of the students and the people around.

CONTENTS

Reproduction in Plants

1

Living beings cannot live forever. They will die after some time. For life to continue, living beings produce young ones of their own kind. The process by which living things produce their own kind is called reproduction. Human beings and animals reproduce by giving birth to their young ones. Plants reproduce mainly through two ways. These are :

- Reproduction through seeds
- Reproduction through different parts

Reproduction Through Seeds

Most plants grow from seeds. The seeds are obtained from flowers and fruits. When seeds get enough water, air and sunlight, they germinate and grow into new plants.

A plant produces a large number of seeds. All these seeds do not grow into new plants. Some seeds are eaten by birds, while some get destroyed. Many seeds are not able to develop into new plants due to lack of moisture or sunlight.

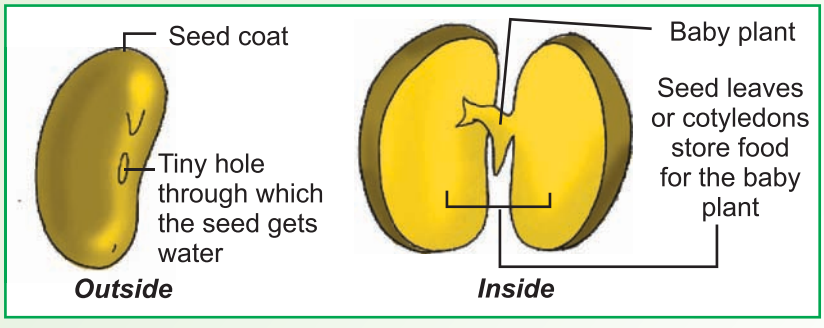
Structure of a seed : Do the following activity to understand the structure of a seed.

Activity 1

To study the structure of a seed.

Materials required : Gram seeds, glass, water.

Procedure : Take some gram seeds and soak them in water for 2-3 days. Take one of these seeds. Remove the outer covering of the seed carefully.



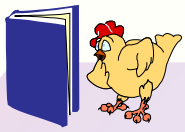
Seed structure

Observation : On removing the outer covering of the seed, you will find two seed leaves and a baby plant in between them.

A seed has three parts : seed coat, cotyledons and embryo. Seed coat is the outer covering of the seed. It protects the baby plant within the seed.

If you remove the seed coat of a gram seed, you will see two seed leaves. These are called cotyledons. They provide food to the growing plant. Seeds get food from the soil in the form of water and nutrients. Between the cotyledons is the baby plant, called the embryo. This baby plant has two parts, the shoot and the root. The shoot grows up to form the stem, leaves and flowers. The root grows down into the soil to form the root of the plant.

Germination of seeds : The process of growing of a seed into a baby plant or seedling is called germination.



Activity 2

To study the conditions required for seed germination.

Materials required : Gram seeds, cotton, shallow dishes and water.

Procedure : Take four shallow dishes. Place cotton in each dish. Take a few gram seeds and put some seeds on each dish. Now follow the steps given below for each dish.

Dish I : Place this dish on a window sill so that it can get adequate air and sunlight. The cotton should be moist.

Dish II : Place this dish in the refrigerator and keep the cotton moist.

Dish III : Place this dish on a window sill so that it can get adequate air and sunlight. Do not wet the cotton.

Dish IV : Place this dish on a window sill so that it can get adequate sunlight. Keep the seeds and the cotton covered with water.

Observation : Observe the four dishes for a few days and write down the results.

On the basis of above results, fill up the following table (Table 1.1).

Table 1.1

Dish	Did the plant grow or not ?	Reason
I	_____	_____
II	_____	_____
III	_____	_____
IV	_____	_____

SEED DISPERSAL

Plants produce a large number of seeds. If all the seeds were to grow under the mother plants, it would lead to an overcrowding of the young plants. All these young plants will not

survive because they would not get enough light, food, water and space to grow. Many of these plants will die. To overcome this problem, seeds are dispersed by various means. The process of spreading seeds away from the mother plant is called seed dispersal. Dispersal of seeds takes place by various means such as wind, water, animals and explosion. These are called agents of dispersal. Let us learn how these agents disperse seeds.

1. Wind

Seeds like madar, cotton, dandelion and maple have fine long hair around them. They are very light. So they are easily carried away by the wind.

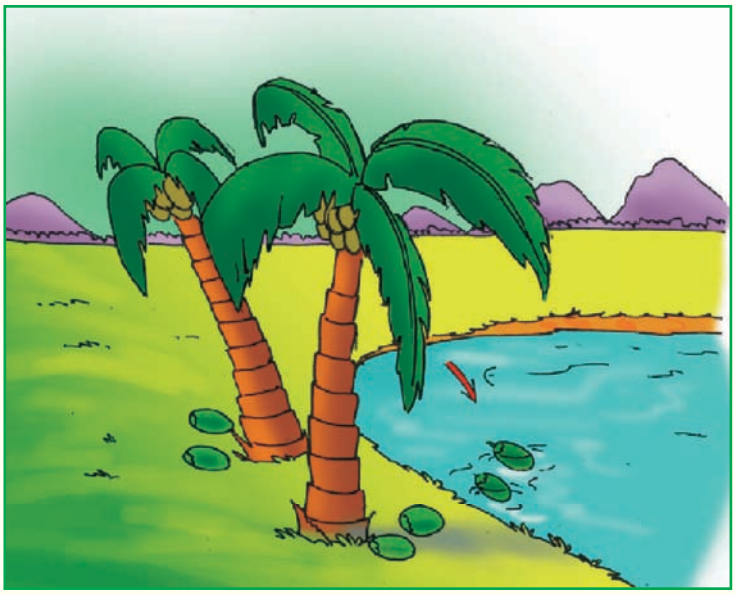
Madar seeds

Cotton seeds

Dandelion seeds

2. Water

The seeds and fruits of plants which grow in or near flowing water are dispersed by water. The seeds of the coconut and waterlily are carried away by water from one place to another. The coconut has a fibrous outer covering and the waterlily fruit has a spongy part which make them float on water and hence these are easily carried away by water.

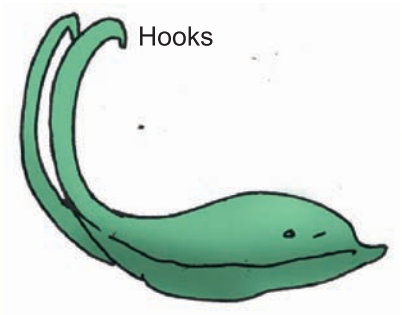


Coconut seeds floating on water

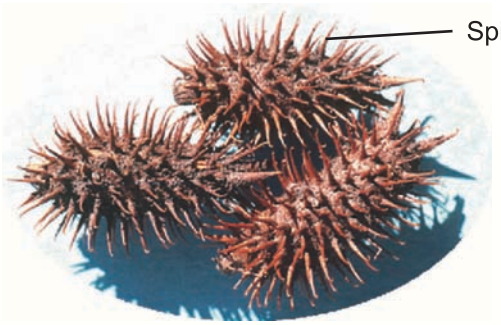
3. Animals

Some seeds have hooks or spikes. They stick to the hairy skin of animals. They then get dispersed to distant places.

Human beings and animals eat certain fleshy fruits. After eating these fruits, they throw away their seeds. In this way, these seeds get dispersed.



Tiger nail



Xanthium seed

A bird eating fruits

Birds swallow some seeds which come out as droppings. These seeds germinate in places far away from the mother plant.

4. Explosion

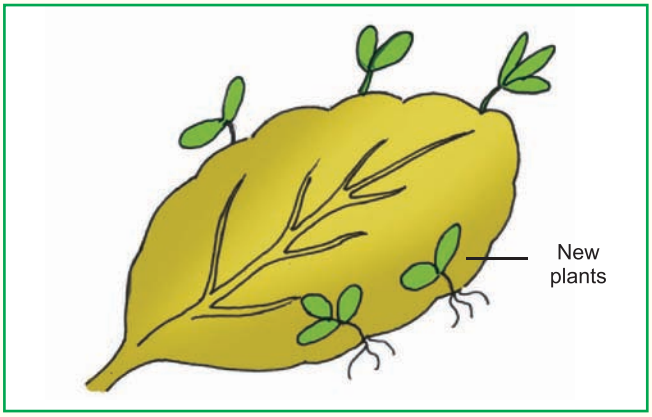
Some fruits on drying burst open or explode. Bursting of fruits helps to scatter the seeds. Pea, geranium and balsam burst open when they ripen. The seeds pop out and are scattered.

Balsam plant with bursting pod

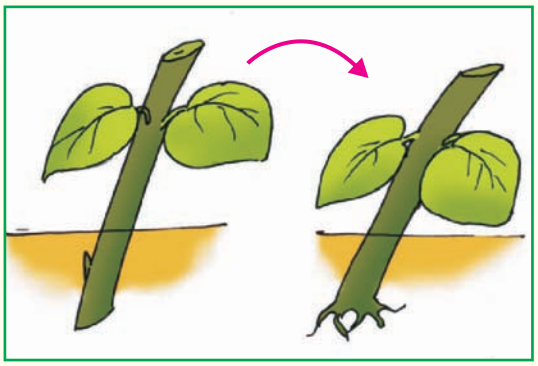
Reproduction Through Different Parts

Some plants do not bear flowers and fruits. Therefore, they do not produce seeds. How do these plants reproduce ? Many of them reproduce through their stems or roots. Some of them reproduce through their leaves, while some reproduce through special structures called spores.

Reproduction from leaves : Some plants reproduce from their leaves. The leaves of a bryophyllum bear buds along their edges. New plants grow from these buds.



Bryophyllum leaf bearing buds along its margin



Stem cutting of rose sprouting leaves and branches

Reproduction from stems : New plants can be grown from stems. Some plants like rose, sugarcane, bougainvillea and hibiscus grow from the cuttings of their stems.

Farmers grow sugarcane by taking a cutting from the stem and planting it in the soil. Cuttings have buds on them which after some time grow into new plants.

Activity 3

To study the process of reproduction from stems.

Materials required : Rose plant, flowerpot, soil and water.

Procedure : Take a flowerpot and fill it with soil. Cut the stem of a rose plant. Now, plant this cutting into the flowerpot. Keep this flowerpot in a place where it receives enough sunlight.

Observation : You will observe the stem cutting gives rise to new leaves and branches.

Potato and ginger are underground stems. They have buds which are known as eyes. These buds grow into new plants.

Reproduction from roots : Sweet potato, radish, carrot and asparagus are roots that have modified to store food. If these roots are replanted, they will grow into new plants.

Radish

Asparagus

Sweet potato

Activity 4

To study the process of reproduction from roots.

Materials required : Radish, flowerpot, soil and water.

Procedure : Take a flowerpot and fill it with soil. Cut off the top portion of a radish that has leaves. Now, plant this cutting into the flowerpot and pour some water into it. Keep this flowerpot in a place where it receives enough sunlight. Water it regularly.

Observation : Observe after a few days. A new plant comes out from the radish top.

Reproduction from spores

Some plants such as algae, fungi, ferns and mosses do not have flowers. Therefore, these plants do not have any seeds. They have special structures called **spores**. These spores grow into new plants.

Fern leaves

Mushroom

You can see spores at the underside of a leaf of the fern plant. Many dark coloured patches are present at the underside of the leaves of a fern plant. Rub these patches between your thumb and forefinger. The powdery substance that can be felt between your fingers are called spores. Fungi such as mushrooms also produce spores.

Key Words

Seed coat	:	the outer covering of a seed
Cotyledons	:	the seed leaves containing food for the baby plant
Embryo	:	the baby plant
Seed dispersal	:	the process of spreading seeds away from the mother plant

Let us Remember

- The process through which living things produce their own kind is called reproduction.
- Plants reproduce through seeds, stems, leaves, roots and spores.
- A seed has three parts : seed coat, cotyledons and embyro.
- The process of growing of a seed into a new plant is called germination.
- Seeds need enough air, water and sunlight for germination.
- The process by which seeds are scattered away from the mother plant is called dispersal.
- Seeds are dispersed by wind, water, animals or by explosion.

EXERCISES

[A] Answer the following questions :

1. Name the different ways of plant reproduction with examples.
2. What is germination ?
3. All seeds are not able to grow into new plants. Why ?
4. Why is dispersal of seeds necessary ?
5. What are the various agents of seed dispersal ?

[B] Mark tick (✓) for the correct and cross (×) for the wrong statement in the box :

1. Plants produce a large number of seeds. ☐
2. All seeds grow into new plants. ☐
3. The seed coat protects the baby plant within a seed. ☐
4. Germinating seeds do not absorb water. ☐
5. Seeds are dispersed by wind, water and animals. ☐

[C] Fill in the blanks :

1. A seed has three parts _____, _____ and _____.
2. The baby plant is called the _____ .
3. Germinating seeds need air for _____.
4. The leaves of a bryophyllum bear _____ along their edges.
5. Farmers grow sugarcane by taking a _____ from the stem.

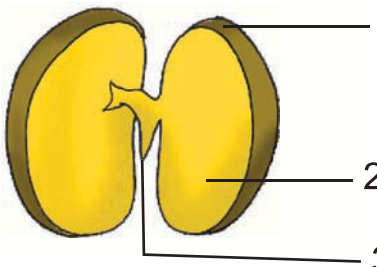
[D] How are these seeds dispersed ? Tick (✓) the correct option :

1.	Mango	wind	water	animal	explosion
2.	Coconut	wind	water	animal	explosion
3.	Waterlily	wind	water	animal	explosion
4.	Pea	wind	water	animal	explosion
5.	Madar	wind	water	animal	explosion

[E] Match the following :

Column A		Column B	
1	Bryophyllum	a	spores
2	Carrot	b	seeds
3	Rose	c	buds
4	Mango	d	stem
5	Bread mould	e	root

[F] Label the diagram given below :



Mention the function of these parts.

More to Do

1. Visit a farmhouse or a field and collect seeds of different shapes, size and colours. Paste them in your scrapbook.
2. Take a potato and a piece of ginger. Plant them in different pots. Observe how the new plants grow from these.
3. Prepare a class project on germination of a bean seed showing different stages.
4. Bring grains and seeds of different plants and make a poster for each type of seed which shows the name of the plant; a sample of the seed(s); a sketch of the plant and its seed.

Did You Know ?

- ★ Seeds of orchid plants are so light that 30,000 seeds weigh just 1 gram !
- ★ The world's biggest tree, the giant redwood, grows from tiny seeds that are less than 2 mm long.
- ★ The world's largest seeds are those of coco-de-mer (double coconut) which can weigh up to 20 kg.

Coco-de-mer

Teacher's Guidelines

1. The main aim of this lesson is to teach students the different ways by which plants reproduce.
2. Ask the students to visit the school garden and make a list of plants growing there. Also find out the conditions which help them to grow well.
3. Explain the role of seed dispersal in the life cycle of a plant.