SCIENCE

Written by :
Ritu Jain

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New Edition

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Preface

Today's children will spend their adult lives in a multitasking, multifaceted, technology driven, diverse vibrant world, and thus they must arrive equipped to do so effectively.

This new edition of 'Science' has been completely prepared in accordance with National Curriculum framework. The most important aim of this series is to develop scientific attitude in children rather than providing information.

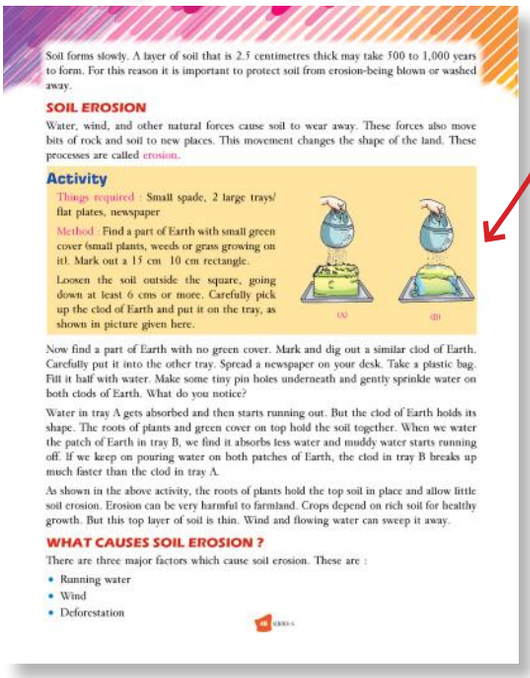
To fulfill our aim, the books are produced in large format, in full colour with attractive illustrations to enhance visual appeal. We hope that our attempt has been successful and a small step towards imparting necessary quality education to our children. Change is a way of life and our endeavour is to continue to evolve the series into a better product. Suggestions and comments are encouraged.

—Publisher

WALKTHROUGH

ACTIVITY

Various activities given in between text to strengthen the knowledge of the concept learned by the student.



Soil forms slowly. A layer of soil that is 2.5 centimetres thick may take 500 to 1,000 years to form. For this reason it is important to protect soil from erosion-being blown or washed away.

SOIL EROSION

Water, wind, and other natural forces cause soil to wear away. These forces also move bits of rock and soil to new places. This movement changes the shape of the land. These processes are called erosion.

Activity

Things required : Small spade, 2 large trays/ flat plates, newspaper

Method : Find a part of Earth with small green cover (small plants, weeds or grass growing on it). Mark out a 15 cm 10 cm rectangle.

Loosen the soil outside the square, going down at least 6 cms or more. Carefully pick up the clod of Earth and put it on the tray, as shown in picture given here.

(A) (B)

Now find a part of Earth with no green cover. Mark and dig out a similar clod of Earth. Carefully put it into the other tray. Spread a newspaper on your desk. Take a plastic bag. Fill it half with water. Make some tiny pin holes underneath and gently sprinkle water on both clods of Earth. What do you notice?

Water in tray A gets absorbed and then starts running out. But the clod of Earth holds its shape. The roots of plants and green cover on top hold the soil together. When we water the patch of Earth in tray B, we find it absorbs less water and muddy water starts running off. If we keep on pouring water on both patches of Earth, the clod in tray B breaks up much faster than the clod in tray A.

As shown in the above activity, the roots of plants hold the top soil in place and allow little soil erosion. Erosion can be very harmful to farmland. Crops depend on rich soil for healthy growth. But this top layer of soil is thin. Wind and flowing water can sweep it away.

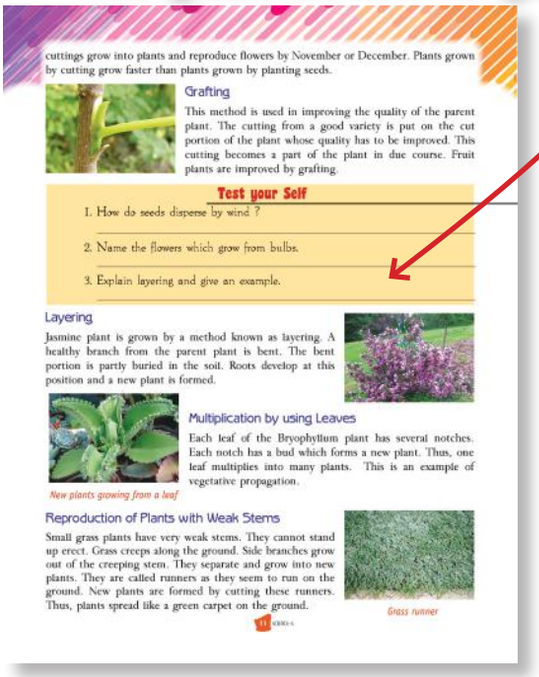
WHAT CAUSES SOIL EROSION ?

There are three major factors which cause soil erosion. These are :

- Running water
- Wind
- Deforestation

TEST YOUR SELF

Questions based on the matter to strengthen the knowledge.



cuttings grow into plants and reproduce flowers by November or December. Plants grown by cutting grow faster than plants grown by planting seeds.

Grafting

This method is used in improving the quality of the parent plant. The cutting from a good variety is put on the cut portion of the plant whose quality has to be improved. This cutting becomes a part of the plant in due course. Fruit plants are improved by grafting.

Test your Self

1. How do seeds disperse by wind ?
2. Name the flowers which grow from bulbs.
3. Explain layering and give an example.

Layering

Jasmine plant is grown by a method known as layering. A healthy branch from the parent plant is bent. The bent portion is partly buried in the soil. Roots develop at this position and a new plant is formed.

Multiplication by using Leaves

Each leaf of the Bryophyllum plant has several notches. Each notch has a bud which forms a new plant. Thus, one leaf multiplies into many plants. This is an example of vegetative propagation.

New plants growing from a leaf

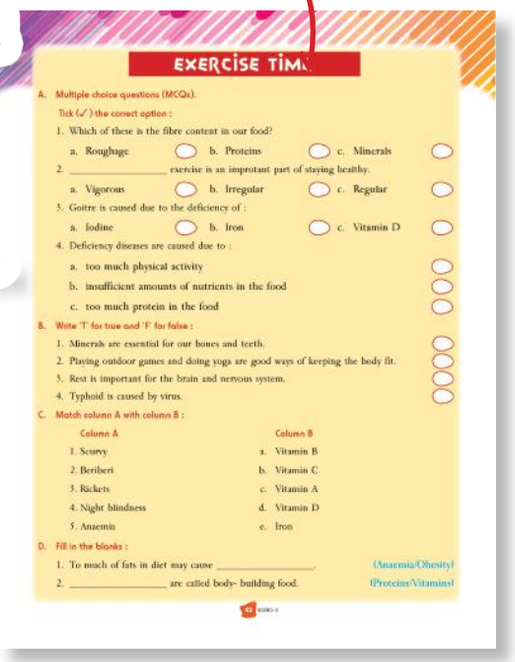
Reproduction of Plants with Weak Stems

Small grass plants have very weak stems. They cannot stand up erect. Grass creeps along the ground. Side branches grow out of the creeping stem. They separate and grow into new plants. They are called runners as they seem to run on the ground. New plants are formed by cutting these runners. Thus, plants spread like a green carpet on the ground.

Grass runner

EXERCISE TIME

Objective and subjective questions included under various segments.



EXERCISE TIME

A. Multiple choice questions (MCQs).

Tick (✓) the correct option :

1. Which of these is the fibre content in our food?
   a. Roughage b. Proteins c. Minerals
2. _____ exercise is an improtant part of staying healthy.
   a. Vigorous b. Irregular c. Regular
3. Goitre is caused due to the deficiency of :
   a. Iodine b. Iron c. Vitamin D
4. Deficiency diseases are caused due to :
   a. too much physical activity
   b. insufficient amounts of nutrients in the food
   c. too much protein in the food

B. Write 'T' for true and 'F' for false :

1. Minerals are essential for our bones and teeth.
2. Playing outdoor games and doing yoga are good ways of keeping the body fit.
3. Rest is important for the brain and nervous system.
4. Typhoid is caused by virus.

C. Match column A with column B :

Column A	Column B
1. Scurvy	a. Vitamin B
2. Beriberi	b. Vitamin C
3. Rickets	c. Vitamin A
4. Night blindness	d. Vitamin D
5. Anaemia	e. Iron

D. Fill in the blanks :

1. To much of fats in diet may cause _____. (Anaemia/Obesity)
2. _____ are called body- building food. (Proteins/Vitamins)

DO YOU KNOW?

Extra information to the concept related.

DISPERSAL OF SEEDS

Plants cannot move. Their seeds are scattered by wind, water and animals. The process of scattering of seeds away from the mother plant is called **dispersal**. Wind, water and animals are the agents of dispersal.

Dispersal by wind

1. **Dispersal by Wind** : Seeds of cotton, madar and hiptage are light. They have hair or wings. They can be easily dispersed by wind.

Do You Know ?

The poppy plant has a capsule that works like a salt and pepper shaker. When wind shakes the capsule, the seeds fall out of its holes.

2. **Dispersal by Water** : The lotus fruit has a spongy part. Coconut has fibrous cover. Both can float in water. Thus, their seeds are dispersed by water.

Dispersal of seed by water

Dispersal of seed by Explosion

3. **Dispersal by Animals** : Some seeds with hooks or spikes stick to the hairy skin of animals and are dispersed. Birds swallow some seeds which come out unharmed in their droppings. Human beings and animals eat fruits and scatter their seeds.

WAYS OF PLANT REPRODUCTION

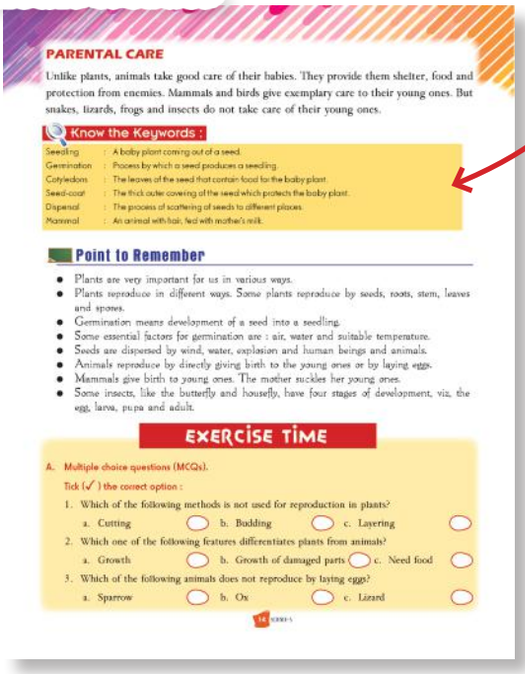
Flower help plants to reproduce. A fruit is formed from a flower. Fruits contain seeds. New plants grow from seeds. Seeds are dispersed by wind, water and animals.

Vegetative Propagation

The reproduction, multiplication or propagation of new plants with the help of any part of parent plant is called **vegetative propagation**. It is done through root, stem or leaf, and the vegetative parts of the plant.

KNOW THE KEYWORDS

Detail meaning about some difficult words.



PARENTAL CARE

Unlike plants, animals take good care of their babies. They provide them shelter, food and protection from enemies. Mammals and birds give exemplary care to their young ones. But snakes, lizards, frogs and insects do not take care of their young ones.

Know the Keywords :

Seedling	:	A baby plant coming out of a seed.
Germination	:	Process by which a seed produces a seedling.
Cotyledon	:	The leaves of the seed that contain food for the baby plant.
Seed-coat	:	The thick outer covering of the seed which protects the baby plant.
Dispersal	:	The process of scattering of seeds to different places.
Mammal	:	An animal with hair, fed with mother's milk.

Point to Remember

- Plants are very important for us in various ways.
- Plants reproduce in different ways. Some plants reproduce by seeds, roots, stem, leaves and spores.
- Germination means development of a seed into a seedling.
- Some essential factors for germination are : air, water and suitable temperature.
- Seeds are dispersed by wind, water, explosion and human beings and animals.
- Animals reproduce by directly giving birth to the young ones or by laying eggs.
- Mammals give birth to young ones. The mother suckles her young ones.
- Some insects, like the butterfly and housefly, have four stages of development, viz. the egg, larva, pupa and adult.

EXERCISE TIME

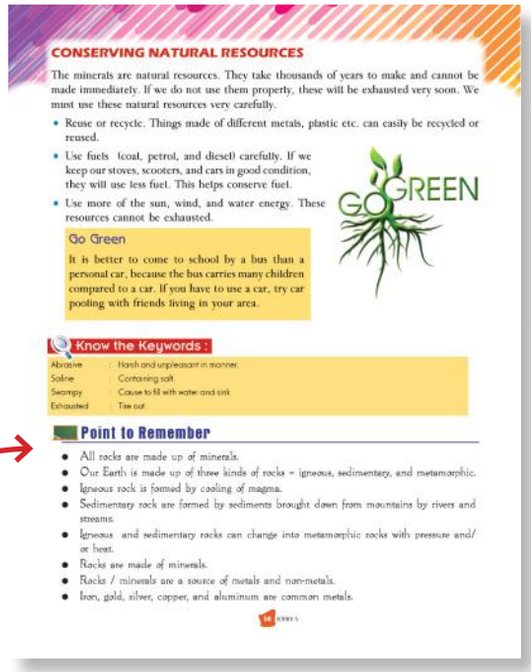
A. Multiple choice questions (MCQs).

Tick (✓) the correct option :

1. Which of the following methods is not used for reproduction in plants?
   a. Cutting ◯ b. Budding ◯ c. Layering ◯
2. Which one of the following features differentiates plants from animals?
   a. Growth ◯ b. Growth of damaged parts ◯ c. Need food ◯
3. Which of the following animals does not reproduce by laying eggs?
   a. Sparrow ◯ b. Ox ◯ c. Lizard ◯

POINT TO REMEMBER

Consolidated concepts of the chapter.



CONSERVING NATURAL RESOURCES

The minerals are natural resources. They take thousands of years to make and cannot be made immediately. If we do not use them properly, these will be exhausted very soon. We must use these natural resources very carefully.

- Reuse or recycle. Things made of different metals, plastic etc. can easily be recycled or reused.
- Use fuels (coal, petrol, and diesel) carefully. If we keep our stoves, scooters, and cars in good condition, they will use less fuel. This helps conserve fuel.
- Use more of the sun, wind, and water energy. These resources cannot be exhausted.

GO GREEN

Go Green

It is better to come to school by a bus than a personal car, because the bus carries many children compared to a car. If you have to use a car, try car pooling with friends living in your area.

Know the Keywords :

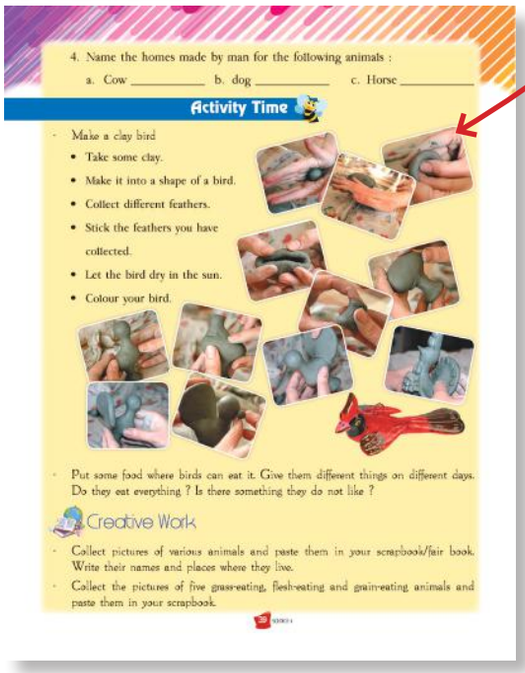
Abrasive	:	Harsh and unpleasant in manner.
Saline	:	Containing salt.
Swampy	:	Cause to fill with water and sink.
Exhausted	:	Tire out.

Point to Remember

- All rocks are made up of minerals.
- Our Earth is made up of three kinds of rocks – igneous, sedimentary, and metamorphic.
- Igneous rock is formed by cooling of magma.
- Sedimentary rock are formed by sediments brought down from mountains by rivers and streams.
- Igneous and sedimentary rocks can change into metamorphic rocks with pressure and/or heat.
- Rocks are made of minerals.
- Rocks / minerals are a source of metals and non-metals.
- Iron, gold, silver, copper, and aluminum are common metals.

ACTIVITY TIME

Various activities to strengthen the knowledge of the concepts learnt by the student.



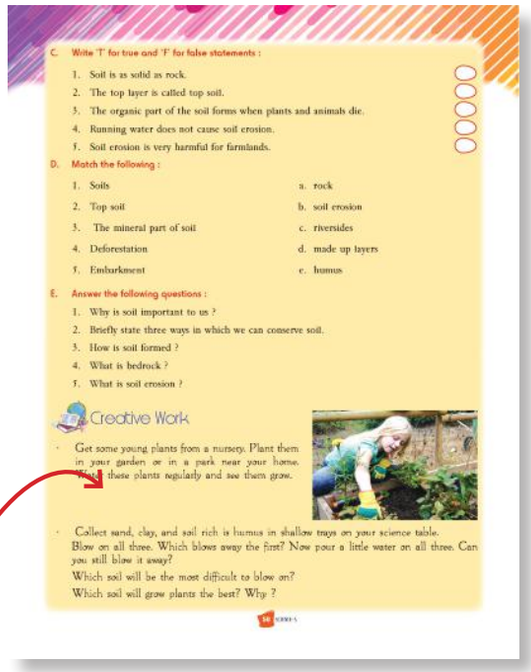
4. Name the homes made by man for the following animals :
   a. Cow _____ b. dog _____ c. Horse _____

Activity Time

- Make a clay bird
  - Take some clay.
  - Make it into a shape of a bird.
  - Collect different feathers.
  - Stick the feathers you have collected.
  - Let the bird dry in the sun.
  - Colour your bird.
- Put some food where birds can eat it. Give them different things on different days. Do they eat everything ? Is there something they do not like ?

Creative Work

- Collect pictures of various animals and paste them in your scrapbook/fair book. Write their names and places where they live.
- Collect the pictures of five grass-eating, flesh-eating and grain-eating animals and paste them in your scrapbook.



C. Write 'T' for true and 'F' for false statements :

1. Soil is as solid as rock. ◯
2. The top layer is called top soil. ◯
3. The organic part of the soil forms when plants and animals die. ◯
4. Running water does not cause soil erosion. ◯
5. Soil erosion is very harmful for farmlands. ◯

D. Match the following :

1. Soils	a. rock
2. Top soil	b. soil erosion
3. The mineral part of soil	c. riversides
4. Deforestation	d. made up layers
5. Embankment	e. humus

E. Answer the following questions :

1. Why is soil important to us ?
2. Briefly state three ways in which we can conserve soil.
3. How is soil formed ?
4. What is bedrock ?
5. What is soil erosion ?

Creative Work

- Get some young plants from a nursery. Plant them in your garden or in a park near your home. Water these plants regularly and see them grow.
- Collect sand, clay, and soil rich is humus in shallow trays on your science table. Blow on all three. Which blows away the first? Now pour a little water on all three. Can you still blow it away?
  Which soil will be the most difficult to blow on?
  Which soil will grow plants the best? Why ?

Some creative work to increase the creativity of the student.

CREATIVE WORK

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