NEP Compliant inside

NEW SCIENCE AHEAD

3

New ScienceAhead

has been developed in accordance with

- the CBSE's educational initiatives for effective teaching and learning
- the guidelines laid down in the National Curriculum Framework
- tried and tested methodology in the teaching of science
- the needs of the teacher and the student

Students' Book

- carefully graded text
- experiments and activities
- appealing images
- attractive layout

Teachers' Resource Pack

- For each lesson:
  - **lesson plan**
  - **question bank** with answers
  - **worksheet** with answers
  - **answers for exercises** in the students' book
  - **activities for assessment**
- **Tests*** and **Examination papers** with answers

** for classes 3–8*

In the Students' Book

Concept Development

Learning Objectives
- encourage students to evaluate their progress and take responsibility for their learning

Mind Opener
- draws students into the lesson
- prepares them for new learning

Lesson Text
- carefully graded
- enables understanding
- visually appealing

In-lesson Activities
- help students develop a scientific temperament

You Now Know
- summarises the lesson
- enables easy revision

Reference

Did You Know?
- nuggets of interesting information

Be Inspired! Scientists and Values
- information on people who have expanded the world of science or made the world a better place

OUR HERITAGE NEW!
- an exploration of India's rich heritage in science

Internet Links
- enable students to use IT to explore topics in greater depth

Glossary
- definitions of technical terms

Smart Book for Teachers

informative, interactive and exciting, with:

- animations
- picture galleries
- audio
- interactive tasks
- presentations
- teachers' resources

including

- extra questions
- worksheets
- concept maps
- question-paper generator

Students' App

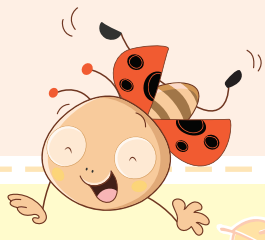
NEW!

questions that help students review lessons

for classes 3–8

Web Support

a portal dedicated to the series with free access for teachers



In the Students' Book

Skill Development

Looking Back

- within-lesson questions
- immediate feedback for the teacher

Exercises

- multiple choice questions (MCQs)
- true or false
- fill in the blanks
- diagram-based questions
- long-answer questions

…and more

Activities for Assessment

- science experiments
- written assignments
- simple projects
- presentations (IT)
- model making
- field trips

…and more

Higher-order Thinking Skills

- questions to improve students' analytical and problem-solving skills

Life Skills

- decision making
- problem solving
- critical thinking
- self management
- effective communication

…and more

Fun Activities

- activities that make learning science joyful

Testing

Tests

NEW!

- short tests to assess students' understanding of concepts

for classes 3–8

Examination Papers

- for examination practice

Contents

7 Nesting Habits of Birds

Mind Opener

Have you seen the nests of birds? How do they look? Where are they built? Have you peeked inside one?

Learning Objectives

By the end of the lesson, you will be able to:

- describe how birds reproduce
- describe the different kinds of nests that birds build
- say why some birds travel long distances

HOW DO BIRDS REPRODUCE?

All birds reproduce by laying eggs. When they have to lay eggs, they build homes called **nests**.

Usually the female bird (the mother) sits on the eggs to keep them warm. Sometimes the male bird (the father) also sits on them.

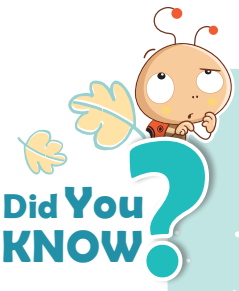
After a few days, the eggs break open and baby birds (**chicks**) come out. This is called **hatching**.

Most chicks do not have feathers. They are as helpless as you were when you were born! Some chicks have feathers and can run around. The parents protect and feed the chicks until they can look after themselves and learn to fly.

After the young birds fly away, the parents also leave the nest. Most birds build a new nest every time they have to lay eggs.

Nest with eggs

Baby birds



The ostrich lays the biggest eggs among all birds. An ostrich egg is as big as 24 hen's eggs put together in weight!

KINDS OF NESTS

Different birds build different kinds of nests. Most birds use **twigs**,[1] leaves, cotton or feathers to make their nests. Some birds use **pebbles**[2] and mud.

A weaverbird makes a ball-like nest that hangs from a tree. The nest has an opening at the bottom through which the bird enters and leaves.

A tailorbird stitches leaves together to make a nest.

An eagle builds its nest high on trees or cliffs with sticks and twigs.

A stork builds its nest on trees with sticks.

A woodpecker makes a hole in a tree trunk and uses it as its nest.

A swan builds its nest on the ground near water bodies using reeds and grass.

Some kinds of swallows build nests on cliffs and walls with mud.

A weaverbird's nest

A tailorbird's nest

An eagle's nest

A stork's nest

A woodpecker's nest

A swan's nest

A swallow's nest

A penguin's nest

[1] twig a small, thin branch of a plant
[2] pebble a small, smooth stone

Some kinds of penguins build nests with stones. The emperor penguin holds its egg on its feet and warms it with its body!

Looking Back

Answer the following questions.

1. What is hatching?
2. Why do birds build nests in places that are difficult for us to see or reach?
3. How does the weaverbird build its nest?

MIGRATION

Birds are great **travellers**.[3] Many birds that live in cold places fly thousands of kilometres to warmer places during winter. They lay their eggs there. When the winter is over, they fly back with their young ones. Their long journey is called **migration**. For example, Siberian cranes fly from Siberia in Russia to China or Iran in the winter. They fly back to Siberia in the summer. No one knows how these birds find their way. Perhaps they use the position of the Sun and the stars.

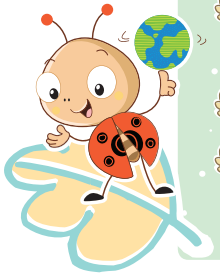
Migration of birds

Did You KNOW?

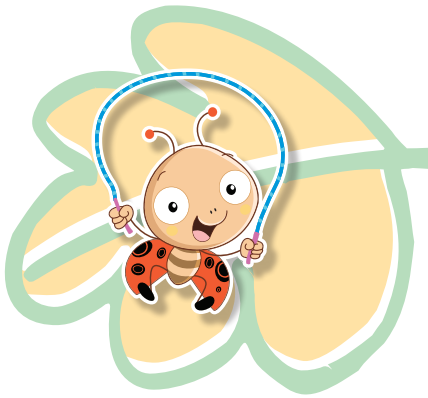
The Arctic tern travels from the Arctic region to Antarctica, where it spends the winter. It flies back to the Arctic region in the summer. It flies approximately 40,000 kilometres every year!

[3] traveller a person who travels

You Now Know...



- Birds build nests when they have to lay eggs.
- The parent birds sit on the eggs to keep them warm.
- The parent birds protect and feed the young ones till they learn to fly.
- Different birds make different kinds of nests.
- Birds living in cold places fly to warmer places during winter. This is called migration.



Exercises

A. Multiple choice questions

1. Which of these things do birds use to build nests?
   a) pebbles b) grass c) twigs d) all of these
2. Where does a woodpecker make its nest?
   a) on a tree branch b) in a tree trunk
   c) amongst tall grass d) on the roof of a building
3. Which bird builds its nest on the ground?
   a) eagle b) swan c) woodpecker d) weaverbird
4. During which season do birds migrate?
   a) winter b) summer c) rainy season d) all seasons

B. Mark ✓ for true and × for false statements.

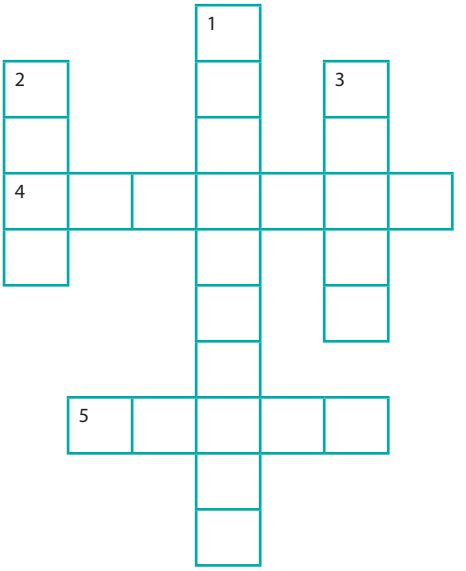
1. All birds lay eggs.
2. Once a bird makes a nest, it always lives in it.
3. Most baby birds that come out of eggs can fly immediately.
4. Eagles build nests with pebbles.

C. Answer the following questions.

1. What do birds do to make their eggs hatch?

2. How do parent birds take care of their young ones?
3. What are the different things with which birds build nests?
4. What is migration?

D. Solve the crossword with the clues given.



Across

4. It builds a mud nest

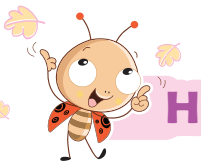
5. A newly hatched baby bird

Down

1. It stitches leaves together for its nest

2. The place where a bird lays its eggs

3. It builds its nest of sticks on trees



Higher-order Thinking Skills

Siberian cranes used to migrate to India about 10–15 years ago. In which months do you think they were seen here?

Life Skills

Birds take care of their young ones. Your parents take care of you. Therefore respect and listen to your parents. Make a card to show them your love.

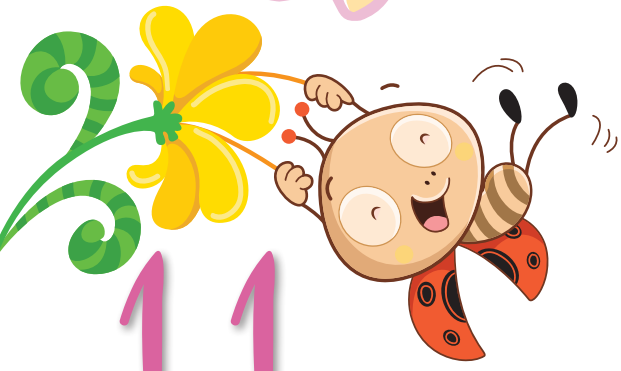
Enrichment Activities

Find a nest near your house or in a park. Observe what the birds are doing and note it down in your note-book. Try to draw the parent birds and colour them too!

Internet Links

http://birding.about.com/od/birdprofiles/ig/Wild-Bird-Nests/House-Finch-Nest.htm

https://www.youtube.com/watch?v=6JCSNvoQl20



11 Light, Sound and Force

Mind Opener

You see shadows when you are out during the day and also indoors. When do you not see shadows? How do you think shadows are formed?

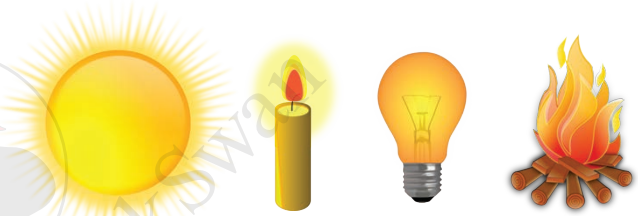
Learning Objectives

By the end of the lesson, you will be able to:

- identify some sources of light
- describe how shadows are formed
- explain how we see objects
- describe how sound is produced
- state the relationship between force, work and energy

LIGHT

You get light from the Sun. You also get light from an electric bulb. Things that give out light are called **sources** of light.

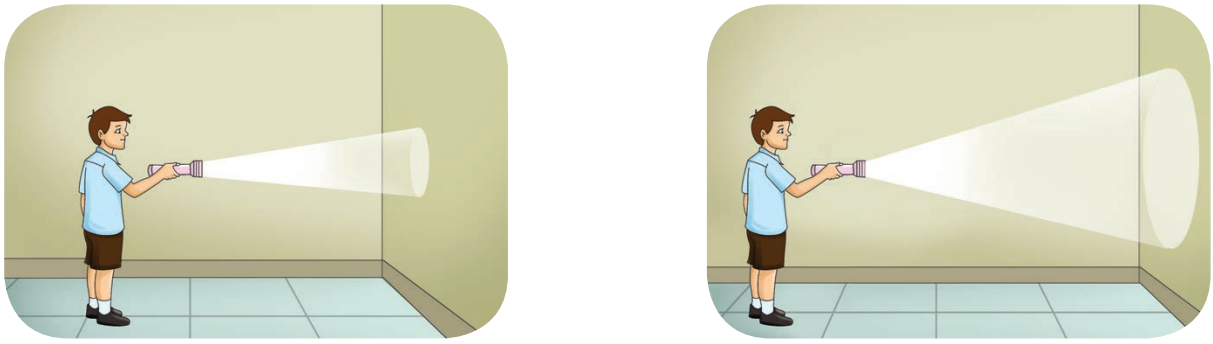


Some sources of light

Light is very important. You can see things only when there is light. Plants can make food only with sunlight.

Shine a torch on a wall. Now, move away from the wall. The lighted area gets larger and less bright.

In the same way, the Sun shines from far away and spreads its light all over the Earth.



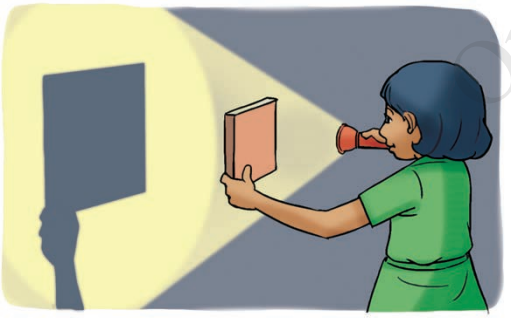
Light shining from far away spreads out.

SHADOWS

Shine a torch on a wall again. This time, hold a book between the torch and the wall. Can you see the shadow of the book and your hand on the wall? Is the shape of the shadow the same as that of the book?

Now, hold a toy between the torch and the wall. What is the shape of the shadow now? Does it look like the toy?

*A **shadow** is formed when something blocks the path of light.* Your hand, a toy and a book block light. Some things allow light to pass through them. Glass lets light pass through it.



The shadow of a book

HOW DO YOU SEE THINGS?

You need light to see things. You can see things that give out light, such as a lighted candle or a lighted electric bulb.

But an apple does not give out light. How do you see the apple? When light from the Sun or an electric bulb falls on the apple, it bounces off. When this bounced light falls on your eyes, you can see the apple.

We see things when light bounces off them.

You see things when they bounce light to your eyes. You can see the Moon when it bounces sunlight to your eyes. *Bouncing of light by an object is called **reflection**.*

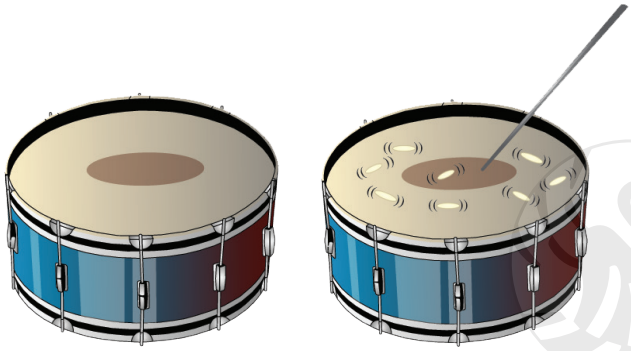
SOUND

The world around you is noisy. You can hear cars moving, music playing, birds chirping and dogs barking.

Pluck a guitar string. You can hear the sound it produces. Look at the

string carefully. Why does it look hazy?[1] Touch it carefully. Do you feel something?

Beat the skin of a drum. You can hear the sound it makes. Quickly place some rice grains on the skin. Do the rice grains jump? Beat the skin again and touch it carefully. Can you feel the skin moving very fast?



The skin of the drum vibrates when it is hit.

The string of a guitar and the skin of a drum produce sound by moving back and forth very fast. **Sound** is produced when anything moves back and forth very fast.

Pleasant sound

Unpleasant sound

This type of movement is called **vibration**.

Some sounds are pleasant. The sound of a guitar and the chirping of a bird are pleasing to the ears. But some sounds are annoying.[2] *Loud and unpleasant sound is called* ***noise***.

The loud noise made by drills, firecrackers, thunder, aeroplanes and vehicles can damage your ears. Even music, if played very loudly, can damage your ears.

Answer the following questions.

1. Can you see the shadow of a windowpane?
2. Why can you not see in the dark?
3. What is noise?

[1] hazy not clear

[2] annoy to irritate or make someone angry

FORCE AND ENERGY

Lift a book. Why does it move? It moves because you **pulled** the book towards you. Open a window. Why does it move? It moves because you **pushed** it away from yourself.

A pull or push is a force.

Things move when you pull or push them. *This pull or push is called a **force**.* Force can move things. If something is heavy, you use more force to move it. You use less force to move light things.

When you move something, you do some **work**. Your muscles need **energy** to do work. Where do you get this energy from? You get energy from food.

From where does a car get the energy to move? It gets energy from petrol or diesel. A battery-operated toy car gets energy from the **batteries** in it.

A car gets energy from petrol.

A toy car gets energy from batteries.

You Now Know...

- Some things, like the Sun and electric bulbs, give out light.
- A shadow is formed when an object blocks the path of light.
- We can see things when they reflect light to our eyes.
- Sound is produced when something moves back and forth very fast (vibrates).
- A push or a pull is a force.
- We need energy to do work.

Exercises

A. Multiple choice questions

1. Which of these is **not** a source of light?
   a) Moon b) Sun c) flame d) bulb
2. Which of these is produced when the path of light is blocked?
   a) reflection b) shadow c) sound d) energy
3. Which of these would allow light to pass through it?
   a) a TV b) a book c) a window pane d) all of these
4. Which of these sounds can cause damage to your ears?
   a) the chirping of a bird b) the sound of a whisper
   c) the bursting of firecrackers d) the sound of leaves in a breeze
5. Which of these has energy stored in it?
   a) food b) battery c) petrol d) all of these

B. Fill in the blanks.

1. We can see a book when it _____ light to our eyes.
2. _____ allows light to pass through.
3. Quick _____ and _____ movements produce sound.
4. To move something we have to _____ or _____ it.
5. Our body gets energy from _____.

C. Draw a circle around the sources of light.

1. 2. 3. 4. 5. 6.



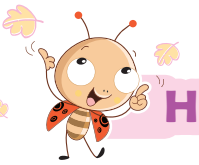



D. Mark ✓ for true and × for false statements.

1. Only the Sun can produce its own light.
2. When the path of light is blocked by an object, a shadow is formed.
3. Back and forth movement of something produces sound.
4. Music can damage your ears if played very loudly.
5. You need more force to move heavy things than light things.

E. Answer the following questions.

1. What is reflection? How do we see things?
2. How is sound produced?
3. What is force?
4. When do you need energy? Where do you get energy from?



Higher-order Thinking Skills

1. Why is an aquarium tank made of glass?
2. Is it advisable to live near an airport? (*Hint*: Think of the noise.)
3. If you shift the tables and chairs in your classroom, what would you have done?

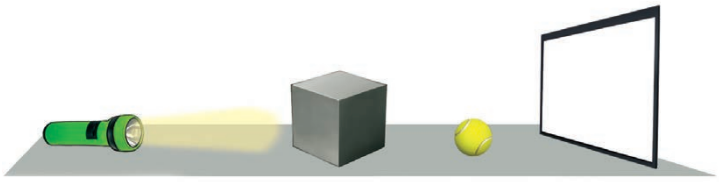
Life Skills

You know that loud sounds can damage your hearing. You should try to reduce the loudness of sounds so that it does not harm anyone's ears.

- Do not play loud music at home.
- Ask people not to blow vehicle horns near a hospital or a school.
- Do not fire loud crackers.
- Ask people not to use loudspeakers near houses, schools and hospitals.

Enrichment Activities

1. Do this in class. You will need a torch, a square piece of cardboard and a ball. Shine the torch on the cardboard and place the ball behind the cardboard, as shown.



Which one of the following is seen on the wall?

a)  b)  c)  d) 

2. Do a project on musical instruments. Pick any three instruments that you like. Paste their pictures in your project file and write about them. Mention how they are played and the kind of sounds they produce. Also write down the name of a famous player of each instrument.

Be Inspired!

CV Raman

Sir CV Raman was the first Indian to win a Nobel Prize in science in 1930. He did experiments on light and explained the blue colour of seawater and the sky. His discovery is commonly known as the 'Raman effect'.

CV Raman

Internet Links

http://www.sciencekids.co.nz/gamesactivities/lightshadows.html

http://www.primaryresources.co.uk/science/science4c.htm

OUR HERITAGE

The Pung cholom

The Pung cholom is a dance of Manipur. Manipur is a state in northeast India. The dance is based on a drum known as 'pung'. The dancers dance and play the pung at the same time. The dance has many steps that involve jumping.

NEW SCIENCEAHEAD
CLASS 3

Orient BlackSwan

The National Education Policy (NEP) 2020 emphasises certain crucial parameters based on content and pedagogy. The New ScienceAhead series provides a rich range of exercises and activities for each of the parameters. Here is a quick reference guide to some of the examples in this book.

The New ScienceAhead series is mapped perfectly to the National Education Policy 2020.

21st Century Skills

A broad set of skills, knowledge, work habits and character traits that are important for success in the 21st century

The NEP parameters	Features	Page nos.
The 4Cs		
Collaboration and Communication	Activity	96
Critical Thinking	Higher Order Thinking Skills	21
Critical Thinking	Higher Order Thinking Skills	34
Social and Emotional Learning	Life Skills	26
	Life Skills	80
Multiple Intelligences	Life Skills	7
	Enrichment Activities	48
	Activity	96

Experiential/ Constructivist Approach

Learners construct their knowledge, based on what they already know, through experience or by doing and reflection

The NEP parameters	Features	Page nos.
Experiential/Constructivist Approach	Enrichment Activities	7
	Activity	53
	Enrichment Activities	68

Integrated Approach

An approach to teaching and learning that works by connecting knowledge and skills across the curriculum, by bringing real life examples to the classroom

The NEP parameters	Features	Page nos.
Subject Integration	Enrichment Activities (General Awareness)	26
	Text (Mathematics)	82–84
	Text (Astronomy)	94–97
Art Integration	Enrichment Activities	43
	Enrichment Activities	99
Health and Wellness	Life Skills	67–68
	Text	69–72
	Life Skills	80

The NEP parameters	Features	Page nos.
Values	Life Skills	99
	Be Inspired!	113
Life Skills	Life Skills	42
	Life Skills	112

Sustainable Development Goals

A framework of 17 global goals designed to be a blueprint to achieve a better and more sustainable future for all

The NEP parameters	Features	Page nos.
Sustainable Development Goals	Life Skills	13
	Life Skills	92
	Life Skills	107

The NEP parameters	Features	Page nos.
Know more about India	Our Heritage	35
	Our Heritage	43
	Our Heritage	81

India Knowledge

A strong focus on ancient knowledge from India, traditional values, modern developments and future aspirations

Digital Integration

The use of digital tools to enhance and support the teaching–learning process

ICT/Digital resources

Orient BlackSwan Smart App - MCQ-based Quizzes for Practice and Revision

Teacher's Smart Book - Flipbook, Audio, Animations, Presentations, Picture Galleries, Interactive Activities, Embedded Questions, Worksheets with Answer Key, Games

Teacher Empowerment

Teachers' Resource Pack - Lesson Plans with Enrichment Activities, Question Bank with Answer Key, Worksheets with Answer Key, Periodic Tests with Answer, Sample Papers for Assessment with Answers, Students' Book Answer Key

Teachers' Portal - Lesson Plans, Question Bank with Answer Key, Worksheets, Sample Assessment, Answer Key (for Exercises and Assessment Papers in the Students' Book; Worksheets and Assessment Papers in the TRP), Periodic Tests with Answer Key

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