Unit: **Human Being**	Chapter : **10. Human Body System: Respiratory System and Circulatory System** Topic : **10.1. Respiratory System**	Total lesson No: 56 / 74 Textbook page: 139 - 140

Lesson 1 / 8

Lesson Title

Breathing

Preparation

limewater, two clear plastic bags

Lesson Flow

1 Introduction (5 min.)

- Recap Gr 3 Chapter 4 'Characteristics of Animals'. State that breathing is a characteristic of animals where air is taken in through lungs or gills and ask:

Q:How do fish breathe in water? (They use their gills to breathe in water.)

Q:What about animals that live on land? (They take in air through their lungs)

Q:Why do we keep breathing? (To be alive)

- Express that air is very essential in life and without air there is no life.

2 Introduce the key question

How does air move in and out of our body?

3 Activity (35 min.)

- Organise students in groups.
- Explain the steps of the activity.
- Remind students to observe the colour of the limewater carefully after shaking.
- Have students do the activity and record their result.
- Ask them to discuss the results in their groups.

4 Discussion for findings (25 min.)

- Ask students to present their results from the activity.
- Write their results on the blackboard.
- Facilitate active students' discussions.

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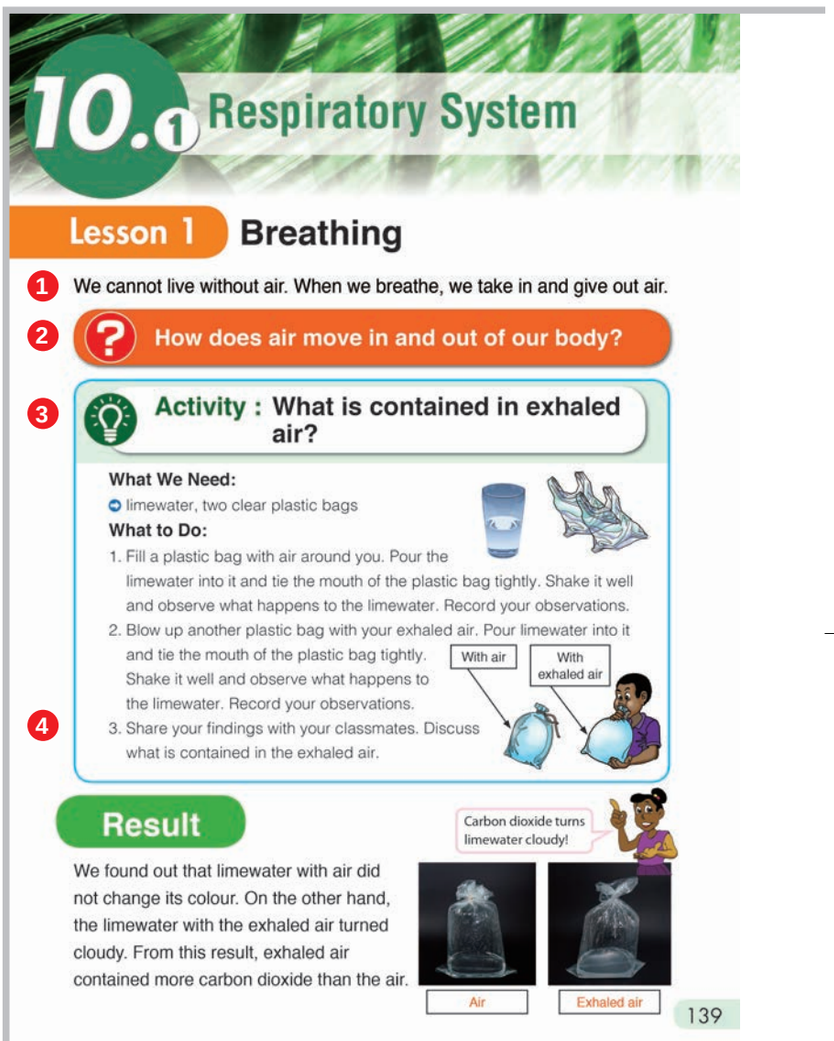


Teacher's Notes

- In Grade 3 Chapter 4, 'Characteristics of Animals' students learnt about breathing as a characteristic of animals in which animals that live on land breathe in through their lungs while those that live in water take in air through their gills.
- Lungs expand and contract, supplying life-sustaining oxygen to the body and removing a waste product called carbon dioxide.
- Breathing starts at the nose and mouth. The inhale air goes into the nose or mouth, and it travels down the back of your throat and into the windpipe or trachea and finally into the lungs.

How to prepare lime water

1. Fill up 500ml container with water.
2. Add 1 table spoon lime.
3. Shake the solution well.
4. Leave the solution to settle overnight so sediments settle at the bottom of the container.
5. Gently pour out the solution without sediments in to a cup.
6. Shake the solution for 1 minute and blow.

Tips of the Activity

1. Limewater must be prepared a night prior to the lesson.
2. Pour out limewater into a cup from the 500ml container.
3. Tie the plastic bags tightly so it doesn't spill when shaking.
4. Be careful not to allow students to taste or drink the limewater.
5. Plastic bag with exhaled air will be cloudy as it indicates carbon dioxide is present.

NOTE: Limewater is used to test for presence of carbon dioxide in breath.

Lesson Objectives

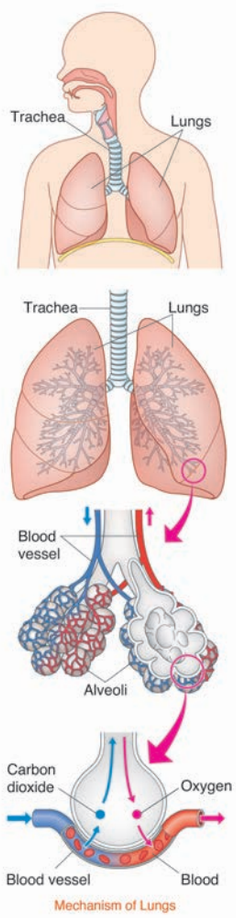
Students will be able to:
- Understand what breathing is.
- Identify how organs work in the respiratory system.
- Observe the change of colour of the limewater with exhaled air.

Assessment

Students are able to:
- Explain what kinds of gas are exchanged during breathing.
- Describe the name of the organs and their work in the respiratory system.
- Illustrate their ideas freely in the change of colour of the limewater with exhaled air.

Summary

Breathing is the process of moving air in and out of the body. When we breathe, we take in oxygen and give out carbon dioxide.
The group of organs in our body that enables us to breathe is called the **respiratory system**. An **organ** is a special part of the body that has a specific form and function. Eyes, ears, brain and heart are examples of organs. The major organs of the respiratory system are nose, trachea, alveoli and lungs. When we breathe in, we take air into our body through our nose. The air moves into our **trachea**, which connects the throat to the **lungs**. In the chest, the trachea is divided into two tubes and each of these tubes leads to one of the two lungs. Each tube is divided into smaller tubes that end in millions of tiny balloon-like air sacs which are called **alveoli**. In the alveoli, oxygen is transferred to the blood. Blood carries oxygen to all parts of our body. At the same time, carbon dioxide is transferred from the blood to the alveoli. When we breathe out, our body gets rid of carbon dioxide.



Mechanism of Lungs

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- **Based on their results,** ask these questions as discussion points.

Q:Is the exhaled air the same as or different from the air? (It is different from air)
Q:Why do you think so? (The colour of the limewater in air is different from that in exhaled air.)
Q:Carbon dioxide turns the limewater cloudy. Which of the two, air or exhaled air has more carbon dioxide? (Exhaled air.)
Q:What do you understand from the result of this activity? (When we breathe out, we give out carbon dioxide. When we breathe in, we take in oxygen)

- Conclude the discussions.

5 Summary (15 min.)

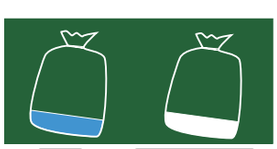
- Ask students to open their textbooks to the summary page and explain.
- Summarise today's lesson on the blackboard.
- Ask these questions as assessment:
  Q: What is breathing?
  Q: What is the respiratory system?
  Q: What are the main organs of respiratory system?
  Q: What air do we take in and give out when we breathe?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
Breathing

Key question:
How does air move in and out of our body?

Activity:
What is contained in exhaled air?



Discussion
Q: Is the exhaled air the same as or different from the air? It is different from air.
Q: Why do you think so?
The colour of the limewater in air is different from that in exhaled air.
Q: Carbon dioxide turns the limewater cloudy. Which of the two, air or exhaled air has more carbon dioxide? Exhaled air
Q: What do you understand from the result of this activity? When we breathe out, we give out carbon dioxide. When we breathe in, we take in oxygen.

Summary
- Breathing is the process of moving air in and out of the body.
- When we breathe, we take in oxygen and give out carbon dioxide.
- A group of organs in our body that enables us to breathe is called the respiratory system.
- An organ is a special part of the b ody that has a specific form and function.
- The major organs of the respiratory system are nose, trachea, alveoli and lungs

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Lesson 2 / 8

Lesson Title

Lungs

Preparation

a plastic bottle with the end cut off,
a balloon, a balloon with the half cut off

Lesson Flow

1 Introduction (5 min.)

- Revise previous lesson by asking:

Q:How does air move into our body?
Q:What is contained in exhaled air?

- Explain that lungs are the main organs of respiratory system and ask the question:

Q:How does the lung work?

2 Introduce the key question

What are the functions and structures of lungs?

3 Activity (35 min.)

- Organise students in groups.
- Explain the steps of the activity.
- Remind students to gently pull and let go of the piece of rubber.
- Have students to do the activity and record their observations on their exercise books.
- Ask students to discuss their findings and how lungs work when breathing by comparing the lung model and the figure in their groups.
- Give enough time to the students to find new ideas through the activity by themselves.

4 Discussion for findings (25 min.)

- Ask students to present their findings from the activity.
- Write their findings on the blackboard.
- Facilitate active students' discussions.
- Confirm the findings with the students.

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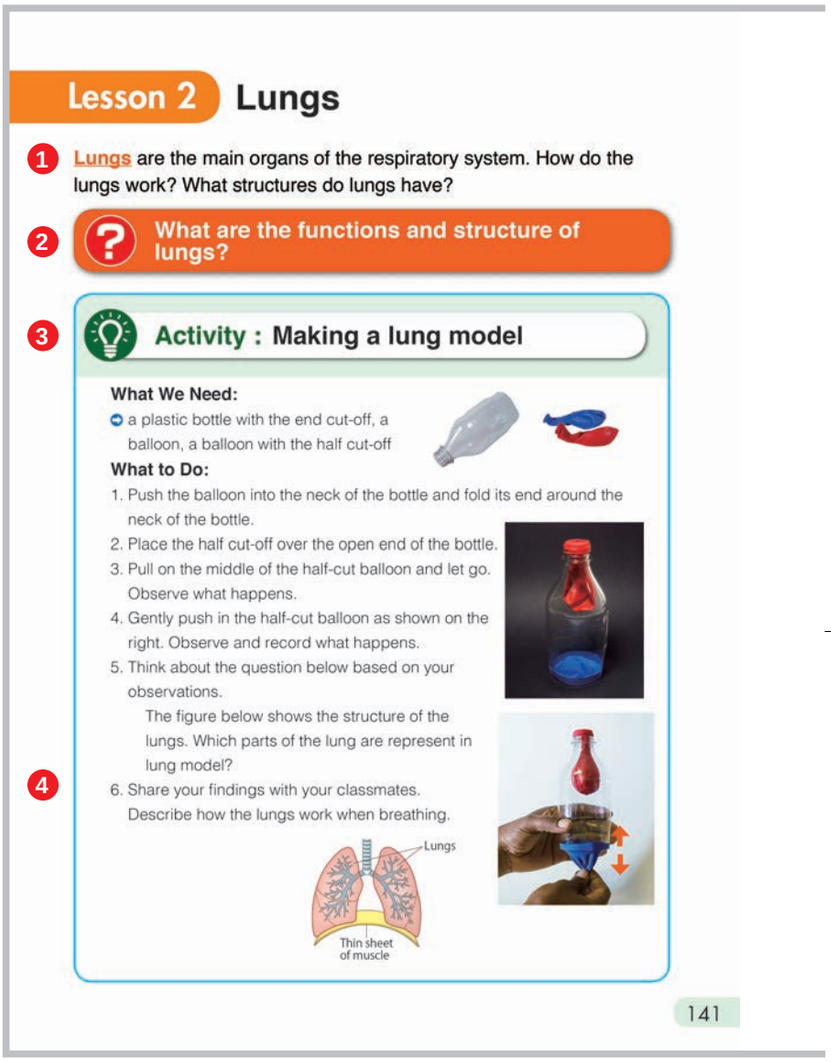

Lesson 2 Lungs

1 Lungs are the main organs of the respiratory system. How do the lungs work? What structures do lungs have?

2 What are the functions and structure of lungs?

3 Activity : Making a lung model

What We Need:
- a plastic bottle with the end cut-off, a balloon, a balloon with the half cut-off

What to Do:
1. Push the balloon into the neck of the bottle and fold its end around the neck of the bottle.
2. Place the half cut-off over the open end of the bottle.
3. Pull on the middle of the half-cut balloon and let go. Observe what happens.
4. Gently push in the half-cut balloon as shown on the right. Observe and record what happens.
5. Think about the question below based on your observations.
   The figure below shows the structure of the lungs. Which parts of the lung are represent in lung model?
6. Share your findings with your classmates. Describe how the lungs work when breathing.

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Lungs
Thin sheet of muscle

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Teacher's Notes

The act of breathing has two stages – inhalation and exhalation

- Inhalation – the intake of air into the lungs through expansion of chest volume.
- Exhalation – the expulsion of air from the lungs through contraction of chest volume.
- Inhalation and exhalation involves muscles, which is called diaphram muscle

Diaphragm muscle

1. During inhalation – the muscles contract:
   - Contraction of the diaphragm muscle – causes the diaphragm to flatten, thus enlarging the chest cavity. The chest cavity expands, thus reducing air pressure and causing air to be passively drawn into the lungs. Air passes from the high pressure outside the lungs to the low pressure inside the lungs.
2. During exhalation – the muscles relax:
   - The muscles are no longer contracting, they are relaxed.
   - The diaphragm curves and rises, the ribs descend and chest volume decreases.

Lung model

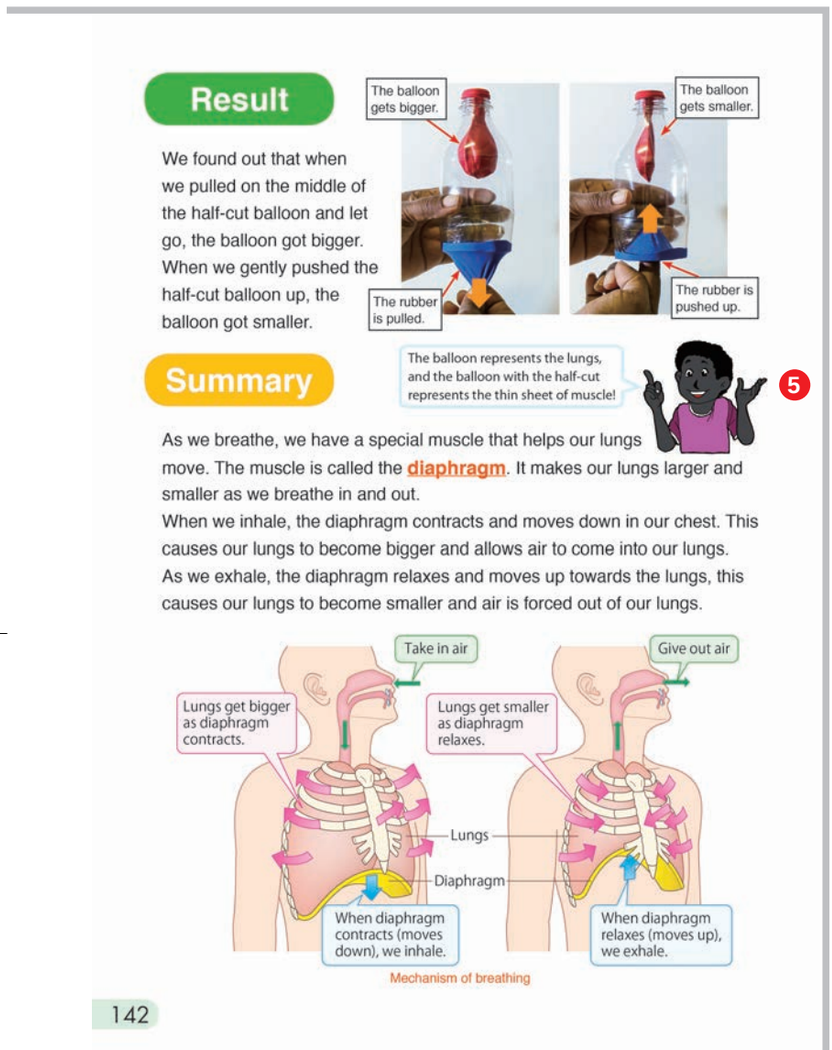
- Balloon represents lungs
- The cut out rubber is the muscle (diaphragm)
- Pulling the cut balloon shows breathing in (inhalation).
- Pushing the cut balloon shows breathing out (exhalation)

Lesson Objectives

Students will be able to:
- Identify the body parts that help human breathe.
- Describe the ways that human breathe in and out.
- Communicate their ideas to others.

Assessment

Students are able to:
- State lungs and diaphragm as the main body parts of breathing.
- Explain how lungs and diaphragm work together when breathing by comparing the lung model.
- Express their opinions during discussion.



- **Based on their findings,** ask these questions as discussion points.

Q:Which part of the lung model represents the lungs? (The balloon)

Q:Which part of the lung model represents the thin sheet of muscle? (The half cut-off balloon)

Q:What is the work of the sheet of muscle? (It changes the size of lungs, etc)

Q:How does the sheet of muscle move? (It goes up and down, etc.)

Q:Can you guess what happens to the sheet of muscle when we breath in or out? (It moves down when we breath in and moves up when we breath out.)

- Conclude the discussions.

5 Summary (15 min.)

- Ask students to open their textbooks to the summary page and explain.
- Summarise today's lesson on the blackboard.
- Ask these questions as assessment:
  Q: What helps lungs become bigger and smaller?
  Q: Which body parts help us breathe?
  Q: How does the diaphragm help when we breath in and out?
- Ask students to copy the notes on the black board into their exercise books.

Sample Blackboard Plan

Title:

Lungs

Key question:
What are the functions and structure of lungs?

Activity : Making a lung model

Results:
1. What happens to the balloon when we pull the centre of the rubber out?
   The balloon gets bigger.
2. What happens to the balloon when we push the centre of the rubber in?
   The balloon gets smaller.

Discussion

Q: Which part of the lung model represents the lungs or the thin sheet of muscle?
The lungs: The balloon
The sheet of muscle: The half cut-off balloon

Q: What is the work of the sheet of muscle?
It changes the size of lungs, etc

Q: How does the sheet of muscle move?
It goes up and down, etc.

Q: Can you guess what happens to the sheet of muscle when we breath in or out? It moves down when we breath in and moves up when we breath out.

Summary
- Lung is a respiratory organs, situated inside the rib cage, that transfer oxygen into the blood and remove carbon dioxide from it.
- Diaphragm is a special muscle that helps our lungs to move.
- When inhaling, the diaphragm moves down. This causes lungs to become bigger and allows air to come into lungs.
- When exhaling, the diaphragm moves up. This causes lungs to become smaller and air is forced out of the lungs.

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Lesson 3 / 8

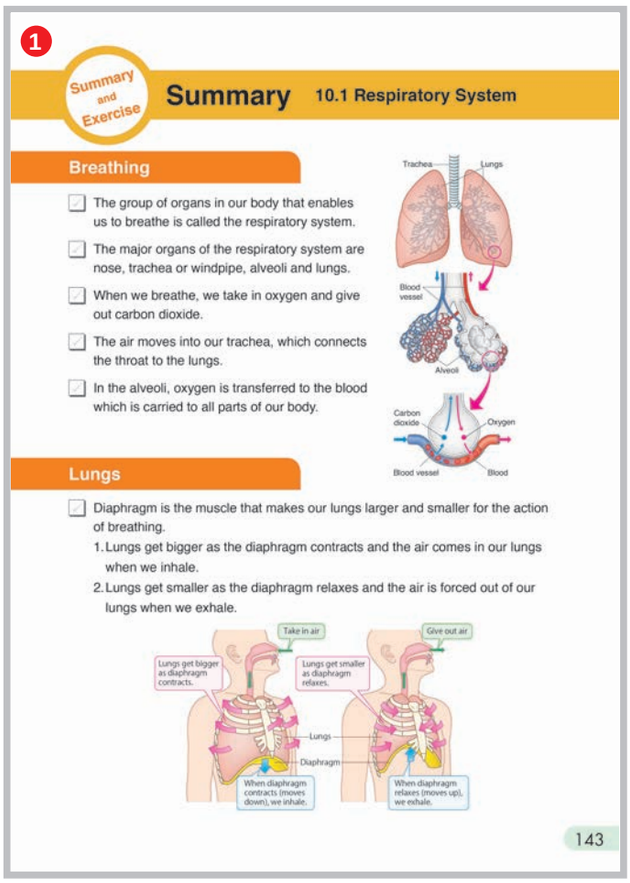
Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (40 min.)

- Recap the main learning contents covered in this topic.
- Base on the main learning contents ask students the following questions.
  - What is a respiratory system?
  - What are the major organs of the respiratory system?
  - How does breathing take place?
- Explain and correct the learning contents if they still have misconceptions.
- Verify their understanding with the summary points.
- Allow students to read aloud the main ideas of the topic and then copy into their exercise books.



1

Summary and Exercise

Summary 10.1 Respiratory System

Breathing

- ☐ The group of organs in our body that enables us to breathe is called the respiratory system.
- ☐ The major organs of the respiratory system are nose, trachea or windpipe, alveoli and lungs.
- ☐ When we breathe, we take in oxygen and give out carbon dioxide.
- ☐ The air moves into our trachea, which connects the throat to the lungs.
- ☐ In the alveoli, oxygen is transferred to the blood which is carried to all parts of our body.

Lungs

- ☐ Diaphragm is the muscle that makes our lungs larger and smaller for the action of breathing.
  1. Lungs get bigger as the diaphragm contracts and the air comes in our lungs when we inhale.
  2. Lungs get smaller as the diaphragm relaxes and the air is forced out of our lungs when we exhale.

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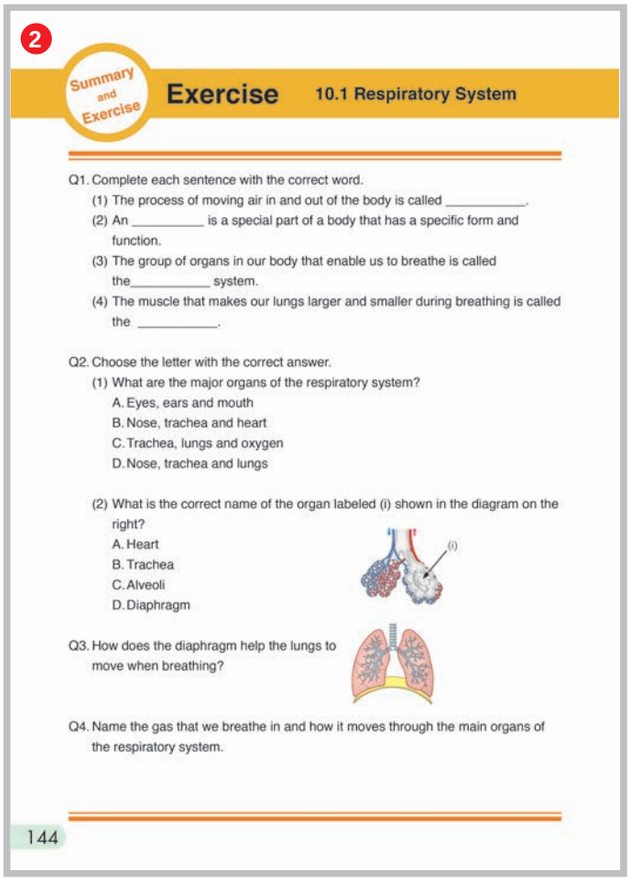
2 Exercise & Explanation (40 min.)

- Go through the instructions of the exercise.
- Allow the students to answer the questions individually and give them enough time to respond to the questions based on their understanding.
- After the exercise give them the answers to the questions and explain how to solve them using their scientific understanding and ideas.
- Make reference to the textbook or provide clear examples in daily life to strengthen the learnt concepts in this topic.



2

Summary and Exercise

Exercise 10.1 Respiratory System

Q1. Complete each sentence with the correct word.
(1) The process of moving air in and out of the body is called _____.
(2) An _____ is a special part of a body that has a specific form and function.
(3) The group of organs in our body that enable us to breathe is called the_____ system.
(4) The muscle that makes our lungs larger and smaller during breathing is called the _____.

Q2. Choose the letter with the correct answer.
(1) What are the major organs of the respiratory system?
A. Eyes, ears and mouth
B. Nose, trachea and heart
C. Trachea, lungs and oxygen
D. Nose, trachea and lungs

(2) What is the correct name of the organ labeled (i) shown in the diagram on the right?
A. Heart
B. Trachea
C. Alveoli
D. Diaphragm

Q3. How does the diaphragm help the lungs to move when breathing?

Q4. Name the gas that we breathe in and how it moves through the main organs of the respiratory system.

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Exercise answers

Q1.
(1) **breathing**
(2) **organ**
(3) **respiratory**
(4) **diaphragm**

Q2.
(1) **D**
(2) **C**

Q3.Expected answer

Lungs gets bigger as diaphragm contracts and air comes into our lungs as we inhale. Lungs get smaller as diaphragm relaxes and air is forced out of our lungs as we exhale.

Q4. Expected answer

When we breathe in, we take in oxygen into our body through our nose. The air moves into our trachea, which connects the throat to the lungs. In the chest, the trachea divides into two tubes and each of these tubes leads to one of your two lungs.