

Class 7	Subject: Science	Topic: Respiration in Organisms
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SUMMARY SHEET		
Pedagogical Approach: Student – led		
Learner Previous Knowledge	Organs of respiratory system, function of respiratory system, physical movement of breathing	
Target Knowledge for this Topic	Definition of respiration Organs of respiratory system Mechanism of breathing Respiration in Earthworm, insects, fish and mammals	
Learning Goals		
More Complex Learning Goal- Students will be able to predict what will happen in given situations with respect to respiratory system.		
Target Learning Goal-Students will be able to describe mechanism of breathing, define respiration and explain how exchange of gases occurs in plants and different types of animals.		
Simpler Learning Goal- Students will be able to list organs of respiratory system in humans as well as different types of animals and define the process of respiration.		
Per iod No.	Lesson Objectives	Teaching Learning Materials Required
1	- Understand cellular respiration - Explain and understand aerobic respiration - Explain and understand anaerobic respiration - Differentiate between aerobic and anaerobic respiration - Define respiration and list the respiratory organs of human body.	- Board and markers - Worksheet 1 - Respiratory System wall chart

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2	Explain the process of breathing.	- Board and markers - Worksheet 2 - Respiratory System wall chart
3	Find out components of exhaled air through experiments.	- Board and markers - Reference sheet 1
4 and 5	Explain the process of respiration in different animals and plants.	- Board and markers - Worksheet 3 - Respiratory System wall chart

Lesson Plan 1

Lesson Objectives

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

- Understand cellular respiration
- Explain and understand aerobic respiration
- Explain and understand anaerobic respiration
- Differentiate between aerobic and anaerobic respiration
- Define respiration and list the respiratory organs of human body.

Teaching Learning Materials required

- Board and markers
- Worksheet 1
- Respiratory System wall chart

Details of Teaching Learning Experience

Seating Arrangement: - Individual

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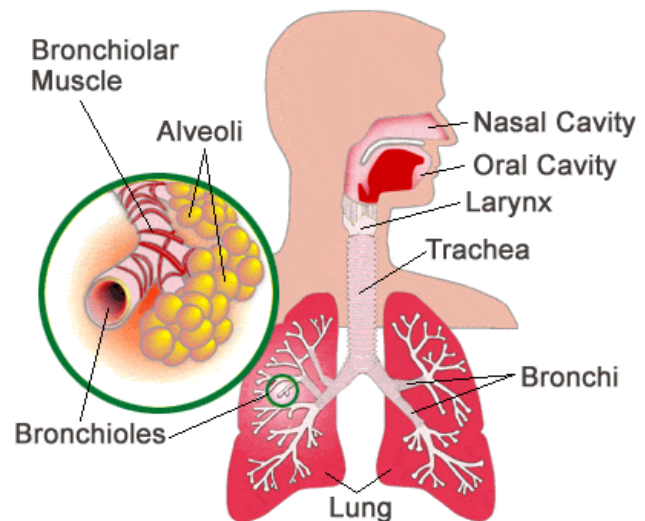
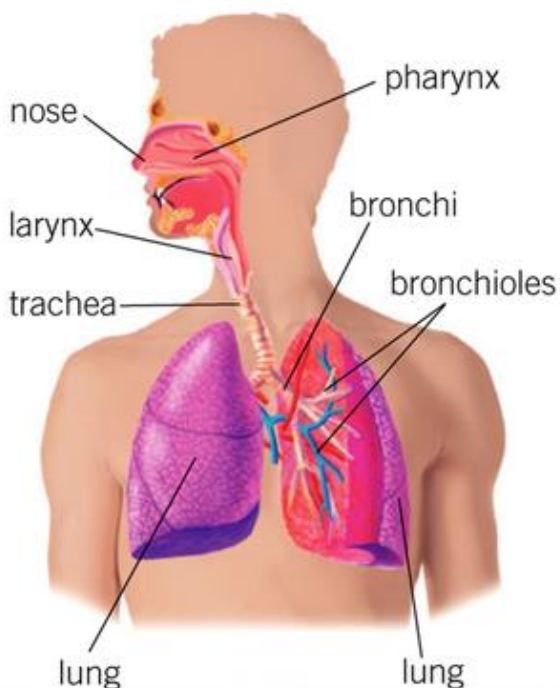


Lesson Beginning <u>Time:</u> 10min <u>Purpose:</u> Introduce the topic.	- Introduce the topic by asking students what happens when they do some form of rigorous physical activity. What change do they observe in themselves? - Collect response and arrive at the conclusion that rigorous activity results in rapid breathing and increased heart rate. - Pose the question: ‘Why does activity result in rapid breathing and increased heart rate? Which human system can be responsible for this?’ - Arrive at a consensus that respiratory system is responsible. Inform the students that they will now find out about it in this class. - Hang the chart of respiratory system on the wall. - Ask the students to read out the labels in order, from nose to bronchioles. - Now ask the students ‘what is respiration?’ After collecting response from few students inform them that they will find out from given data.
Lesson Middle <u>Time:</u> 20 min. <u>Purpose:</u> Develop conceptual understanding	<u>Worksheet</u> - Now, distribute worksheet 1. - Instruct the students to attempt worksheet 1 - Let there be a whole class discussion and all the answers can be discussed together. - Ensure that the whole class is on the same page.
Lesson End <u>Time:</u> 5min <u>Purpose:</u> Recap students' learning	- Wrap up the class by clearing their doubts. Home Assignment - Homework part of the assignment.

Worksheet 1

Skill: Comprehension

Information

The respiratory system

- All living things are made of cells and these cells perform different types of functions.
- To function properly, the cells need energy.
- The food is stored in the form of sugar or glucose in cells. This glucose when combined with oxygen breaks down, to give carbon dioxide, water and energy. The energy is then used for the functioning of cells.
- When we breathe, we breathe in air rich in oxygen. The oxygen breaks down food inside the cell to release energy. The carbon dioxide produced during the process is given out when you breathe out.

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- Respiration is said to happen only when oxygen is used to break down food and energy is released.
- Since respiration occurs in cells, it is called cellular respiration. Oxygen is used in the respiration and so it is also called as aerobic respiration.
- Some animals break down food in absence of oxygen into carbon dioxide and alcohol. This type of process is called anaerobic respiration and the animals carrying out this respiration are called anaerobes. Eg. Yeast
- When you do rigorous exercise, your requirement of energy is more. Sometimes, the supply of oxygen does not meet the demand of energy needed for exercise. In such cases, muscles provide energy in absence of oxygen, by breaking down the food stored inside it. Partial breakdown of glucose results in lactic acid and energy. This lactic acid gets stored in the muscles which may result in cramps. When the supply of oxygen increases, the lactic acid breaks down into carbon dioxide and water.

Attempt the following questions on the basis of above information.

1. Based on the information, which of the following is the most accurate definition of respiration?

- Breathing in oxygen rich air and breathing out carbon dioxide is called respiration.
- The process in which food is broken down with the help of oxygen into carbon dioxide and water and energy is released and it is called respiration.
- Breathing in and out is called respiration.

2. What is cellular respiration?

3. Fill in the gaps using suitable words from the brackets.

(energy, oxygen, carbon dioxide, water vapour, cellular, anaerobe, aerobic)

When respiration is carried out in absence of _____ it is called anaerobic oxygen. Yeast is an _____ which respire anaerobically. The common products of aerobic and anaerobic respiration are _____ and _____.

4. Given below are two word equations representing aerobic and anaerobic respiration. Identify them from the given products.

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1. Glucose With the use of oxygen → carbon dioxide + water + energy

2. Glucose Without the use of oxygen → carbon dioxide + alcohol + energy

5. Based on your knowledge now, write the definition of respiration and cellular respiration.

a. Respiration

b. Cellular Respiration

Homework

I. Define:

a. Respiration: _____

b. Anaerobes: _____

II. Fill in the blanks:

a. When oxygen demand is not met, muscles carry out _____ for more energy.

b. _____ is produced due to partial breakdown of glucose by muscles.

c. Alcohol is a product of _____ respiration.

d. The trachea divides into two _____ and each one enters a lung.

e. Each bronchus divides into _____ and each _____ ends into alveoli.

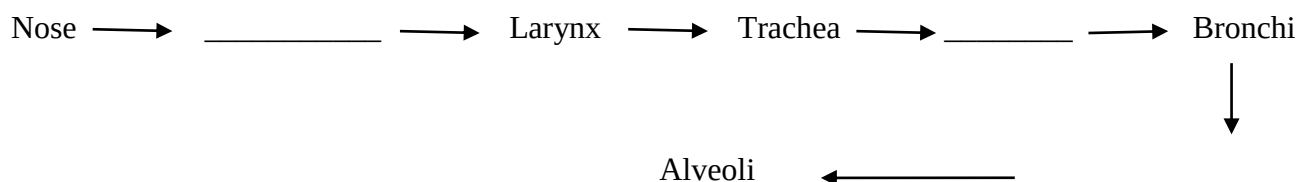
III. Answer the following

1. List the organs of respiratory system.

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2. Observe the diagram and fill in the blanks in the following flow chart which shows route of the air breathed in:



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Period 2

Lesson Objectives

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

- Explain the process of breathing.

Teaching Learning Materials required

- Board and markers
- Worksheet 2
- Respiratory System wall chart

Details of Teaching Learning Experience

Seating Arrangement: In groups of 4-5

Lesson Beginning <u>Time:</u> 5min <u>Purpose:</u> • Activate prior knowledge	<u>Homework Sharing</u> • Ask the students to share their homework in groups. • Let there be a whole class discussion where the answers are discussed. • Ask them to think how the carbon dioxide from all over the body reaches the lungs and what happens there. • Collate their responses on the board.
Lesson Middle <u>Time:</u> 25min. <u>Purpose:</u> • Develop conceptual understanding	• Let few students come in front of the class. Ask them to inhale and exhale slowly so that other can observe them. • Ask the students to share their observations. • Discuss the process of the breathing with the help of the respiratory chart. • Distribute worksheet 2. • The students must attempt questions all the questions. • Have an open forum discussion in which all the questions are discussed. • Arrive at a common consensus.

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Lesson End <u>Time:</u> 5 min <u>Purpose:</u> • Finish Up	<u>Finish Up</u> • Wrap up the discussion by clearing doubts if the students have.
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Worksheet 2

Skill: Comprehension

Answer the questions:

1. What is diaphragm? Where is it located?

2. Which organs form respiratory system?

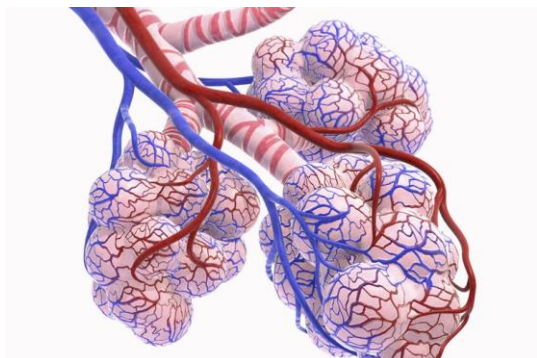
3. Breathing involves _____ which means taking in air and _____ which means giving out air.

4. What happens to the respiratory organs during inhalation?

5. What happens to the respiratory organs during exhalation?

6. Where does the air that you inhale, reach ultimately inside the lungs?

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7.

What does the above diagram tell you?

8. How does the carbon dioxide get inside the lungs?

9. Where does exchange of gases take place exactly in the lungs?

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Period 3

Lesson Objectives

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

- Find out components of exhaled air through experiments.

Teaching Learning Materials required

- Board and markers
- Reference sheet 1
- Material for activity 1 (for each group)- mirror, cloth and a syringe
- Material for activity 2 (for each group)- test tube, freshly prepared lime water and straw

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4-5 students

Lesson Beginning <u>Time:</u> 5 min <u>Purpose:</u> Activate prior knowledge	<u>Brainstorming</u> • Ask the students the following questions to have an active brainstorming session. ○ When you inhale air, which gases are present in abundant? ○ When you exhale air which specific gas is present in abundance? ○ How can you test presence of carbon dioxide in any sample or air or liquid? ○ What is condensation? ○ Give an example of condensation. • Collate their answers on the board. • Now inform the students that they will find out the components of air that is breathed out through activities.
Lesson Middle <u>Time:</u> 30 min. <u>Purpose:</u> • Develop conceptual understanding	<u>Experiment</u> • Make groups of the students and provide the materials to them. Discuss the steps to be followed given in the reference sheet. • Ask them to follow the instructions and do the activities. • Ask the students to write down their observation. • Have a whole class discussion on the observation. • Ensure that the whole class arrives at a consensus.

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Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Finish Up	<u>Finish Up</u> Wrap up the class by answering doubts if the students have.

Reference sheet 1

Activity 1

Material: Mirror, cloth, syringe

Instructions

1. Wipe the mirror with a cloth.
2. Blow out exhaled breath on the mirror.
3. Observe and record your observation.
4. Clean the mirror and blow air on the mirror with a syringe.
5. Observe and record your observation.

Activity 2

Materials: Test tube, freshly prepared lime water, plastic straw.

Instructions

1. Take a test tube and add some freshly prepared lime water in it.
2. Blow gently through the straw a few times in the test tube.
3. Observe and record your observation.

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Period 4 and 5

Lesson Objectives

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

- Explain the process of respiration in different animals and plants.

Teaching Learning Materials required

- Board and markers
- Worksheet 3

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 or 5

Lesson Beginning <u>Time:</u> 10 min <u>Purpose:</u> Activate prior knowledge	<u>Brainstorming</u> • Begin the class by having brainstorming session. • Ask questions such as: ○ Do all living things undergo respiration? ○ Do all animals have lungs and similar respiratory organs? ○ Do you think microorganisms need oxygen too? ○ Why is respiration essential for all organisms? ○ Which gases will be exchanged in living things during respiration? • Ask one representative of each group to answer questions. The groups may pose their own questions too. • Collect response from the students. They must be in consensus with the answers. Inform the students that they will now read page numbers 115 and 116 of their NCERT book.
Lesson Middle <u>Time:</u> 50 min. <u>Purpose:</u> • Develop conceptual understanding	<u>Videos</u> • Distribute worksheet 4 to them. • Ask the students to first read the pages 115 and 116 • They must read them carefully and attempt the questions. • After the students have attempted the questions, let there be a discussion on the answers within the groups. • Discuss the answers with them. If required explain the topics while

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	discussing the answers.
Lesson End <u>Time:</u> 10 min <u>Purpose:</u> Finish Up	<u>Finish Up</u> Wrap up the class by clearing doubts.

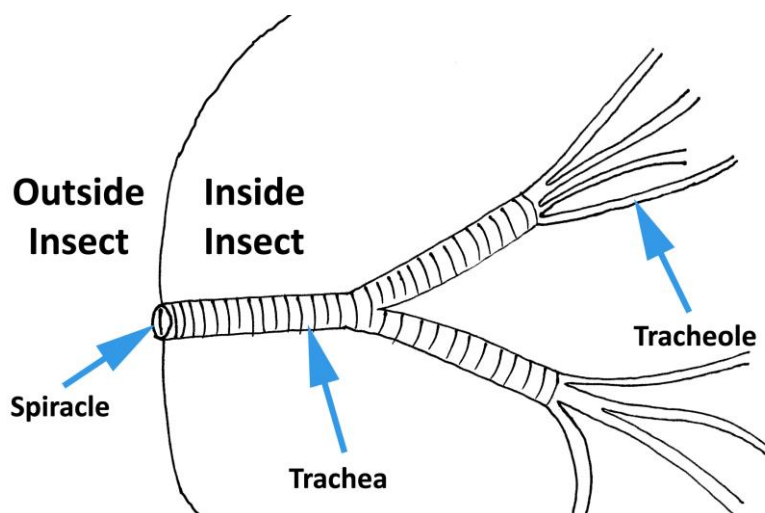
Worksheet 3

Skill: Observation and Comprehension

I. Name few animals which have respiration process is similar to that of human being's way of respiration?

Answer the following:

A.



Q1. What is the spiracle show in the above diagram?

Q2. The air tubes in insects are called trachea. With reference to trachea, explain how exchange of gases takes place in insects.

Q3. Name few animals which have respiratory system similar to the above diagram.

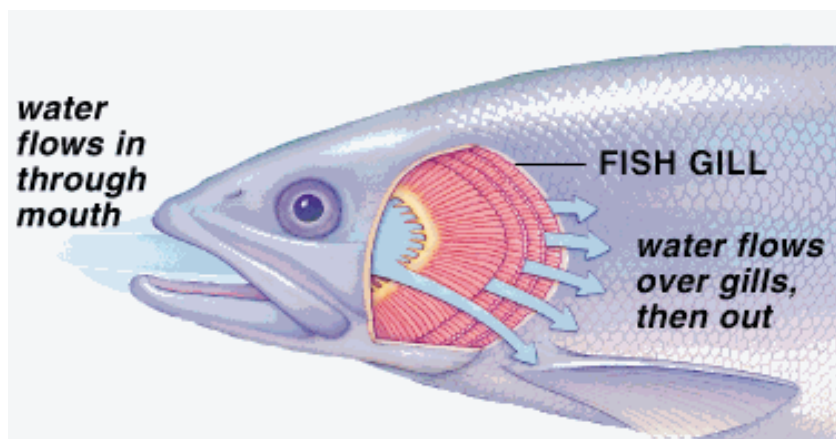
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B.



Q1. How do earthworms respire?

C.



Q1. How do fishes breathe?

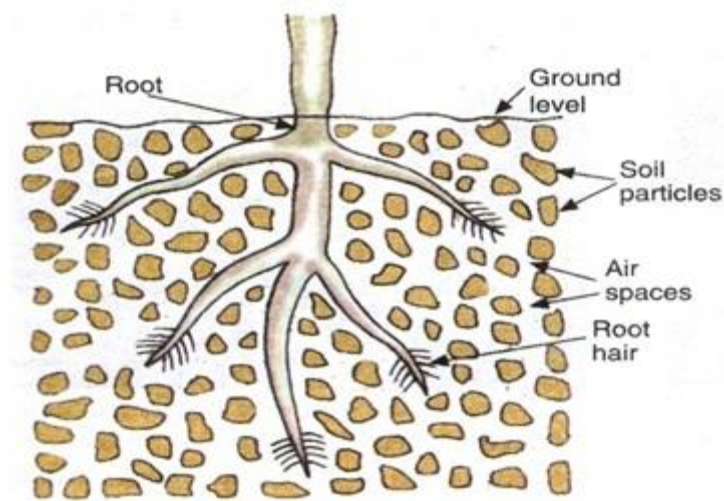
Q2. Why do you think the gills of fish are surrounded by lot of blood capillaries?

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Part 2

Answer the following:

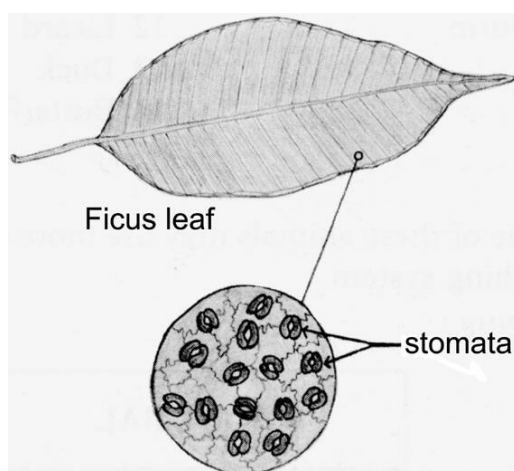
A.



1. How do roots of plants find oxygen for respiration?

2. What are root hairs? What do they do?

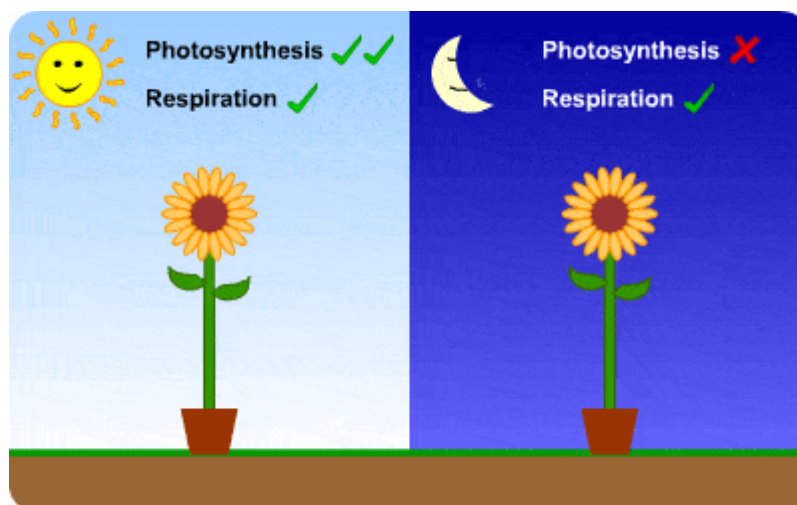
B.



3. How do leaves breathe?

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C.



4. How are photosynthesis and respiration different?
