

MODEL LESSON PLAN FOR ALL TYPES OF HIGH SCHOOLS

CLASS : X

SUBJECT: Biological Science

Name of the Teacher :

Name of the School:

Name of the Lesson/Unit	Topic	No. of Periods Required	Time line for teaching		Any specific Information
			From	To	
Respiration	Human Respiration	3			A recent study has identified a new lung cell type that induces the body's innate immune defence against Streptococcus pneumonia. Safety measures regarding corona.
	Cellular Respiration	2			
	Respiration versus combustion,	1			
	Evolution in gaseous exchange system	1			
	Respiration in plants	2			
	Photosynthesis versus Respiration	1			

Prior Concept/ Skills: (Essential concepts and skills to be checked/bridged before teaching the current concept.)

Berating, Pulmonary respiration - lungs, Tracheal respiration in insects, Cutaneous respiration in earthworm, Aquatic respiration – gills in fishes, Fermentation, Areal roots, Mitochondria, Blood functions, Diffusion

Learning Outcomes: (Select from SCERT Academic Calendar and Textbook)

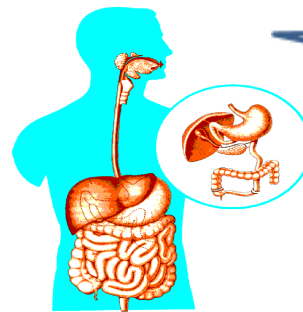
1. Differentiates Aerobic and anerobic respirations, Combustion and respiration, Photosynthesis and respirations.
2. Plans and conducts investigations / experiments to observe anaerobic respiration and to observe releasing of carbon dioxide and heat during aerobic respiration.
3. Relates pain in muscles after strenuous exercise with anaerobic respiration.
4. Explains the process of respiration in human beings, plants and animals.
5. Draws labelled diagrams / flow charts / concept maps of respiratory system and mitochondria.
6. Analyses and interprets data regarding percentage of gases in inhaled and exhaled air.
7. Applies learning to hypothetical situations, such as what happens if there is no diaphragm and epiglottis.
8. Takes initiative to know about scientific discoveries related to respiration and gases.
9. Exhibits creativity in designing models using eco-friendly resources, such as respiratory system.

**No. of Periods:
10**

TEACHING LEARNING PROCESS

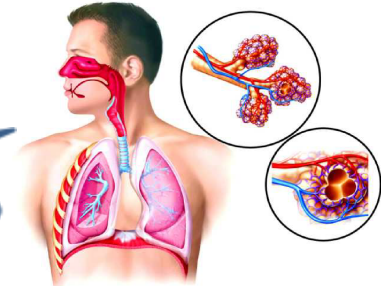
Induction/Introduction *(Generating interest, informing students about the outcomes and expectations for the lesson)*

I will give a role play script to two of my students regarding discussion on ‘releasing of energy’ between digestive system and respiratory system. Then facilitates a discussion on who is right and why? Then lead in to the topic by asking how the energy is made available to our body?



I take food and digest it. Food gives energy. So, I am responsible for giving energy

I breath and take in oxygen. Oxygen is required to produce energy. So, I am responsible for giving energy.

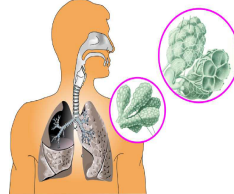


Experience and Reflection *(Task/question that helps students explore the concept and connect with their life)*

- Consult a Pulmonologist and know about human respiratory problems.
- Collect information on respiratory problems at different work places like traffic, mining, cement factories etc.
- Show a picture printed on cigarette packet and discuss regarding the evil effects of smoking and other substance misuse.

Explicit Teaching/Teacher Modelling *(I Do)*

1. Discussion on discovery of gases
2. Discussion on steps in respiration,
3. Explanation of chart showing pathway of air.
4. Discussion on mechanism of respiration in human beings – role of diaphragm and rib cage.
5. Analysis of % of gases in inhaled and exhaled air.
6. Discussion on exchange of gases and transport.
7. Discussion on Cellular respiration – Aerobic and anaerobic respirations.
8. Discussion on Respiration versus combustion – heat production.
9. Picture illustration on evolution in gases exchange system.
10. Picture illustration on Respiration in plants.
11. Discussion on Photosynthesis versus Respiration



Group Work *(We Do)*

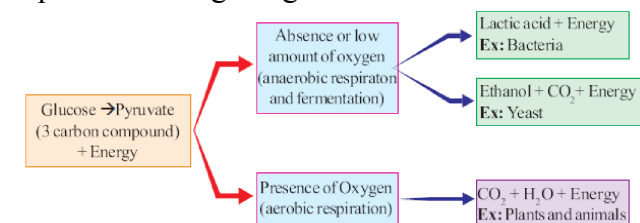
1. Observation of function of epiglottis (Activity -1)
2. Make the students prepare some questions to analyse the data given in the following table.

Gas	% in inhaled air	% in exhaled air
Oxygen	21	16
Carbon dioxide	0.03	4.4
Nitrogen	78	78

3. Some experiments with yeast (Lab Activity)
4. Activity to observe changes during combustion of sugar (Activity -2)
5. Activity to show CO₂ evolved in respiration (Activity -3)
6. Activity to show heat evolved in respiration (Activity -4)
7. Make the students prepare a questionnaire to interview a pulmonologist regarding the health of lungs.
8. Prepare models of structure of mitochondria and working modal of respiratory systems using the available materials.

Independent Work *(You Do)*

9. Give a flow chart showing pathway of air and make the students prepare their own notes on it in their own sentences.
10. Make the students prepare few sentences to indicating the similarities and differences between aerobic and anaerobic respirations using the given flow chart.



11. Draw the charts showing structure of mitochondria and respiratory system.
12. Prepare flow charts showing mechanism of respiration.

Check For Understanding Questions

1. Factual:

- What is respiration?
- Which part prevents the entry of food and water in to trachea?
- What is the site of cellular respiration?
- What are the respiratory organs in frog?
- Through which part does the gaseous exchange takes place in the stems?
- What is anabolic process?

2. Open Ended / Critical Thinking:

- What may happen if there is no diaphragm?
- Why oxygen level decreased in exhaled air?
- Why can't we breathe at higher altitudes?

Student Practice Questions & Activities *(Exercises from workbook / textbooks/ blackboard)*

- State two similarities between aerobic and anaerobic respiration.
- How are alveoli designed to maximize the exchange of gases?
- How gases exchange takes place at blood level?

TLMs *(Digital + Print)*

DIKSHA Resource link:

https://diksha.gov.in/play/content/do_31320682579392921618154

Use the language lab pen drive resource.

Some of the other digital resources are:

<https://youtu.be/E2OofgrxPMo>

<https://youtu.be/Wkziv3ZqzV0>

https://youtu.be/TSe7Zrgi_A8

https://www.youtube.com/watch?v=Eb-oxShmSGI&list=PLTmqBmlRAx4C237mll4QRmMDN_2SvT9K7

Respiratory system modal, Lungs working modal, Mitochondria modal, pathway flow chart,

Charts, Pictures showing different respiratory organs,

Thermos flask, Thermometer, glucose, water, Janus green B, yeast, liquid paraffin, stoppers, delivery tubes, , lime water, wash bottle, test tubes, spirit lamp, glass bottles, beakers, germinating and dry seeds.

Inter textbooks

Assessment *(Think of what children SAY, DO and MAKE while learning that can form the evidence of learning to be used for assessment).*

1. Differentiate Aerobic and anerobic respirations
2. How can you prove that carbon dioxide is released during respiration?
3. You may feel pain in your muscles after playing. What might be the reason?
4. Explain the mechanism of gasses exchange at bronchiole level.
5. Draw labelled diagram of mitochondria.
6. Study the given table and answer the questions?

Gas	% in inhaled air	% in exhaled air
Oxygen	21	16
Carbon dioxide	0.03	4.4
Nitrogen	78	78

- Why does the amount of Oxygen vary between exhaled and inhaled air?
- What has raised the percentage of carbon dioxide in exhaled air?

7. What happens if there is no epiglottis?

SIGNATURE OF THE TEACHER

SIGNATURE OF THE HEAD MASTER

VISITING OFFICER WITH REMARKS