



# Grade 11



# SCIENCE



## Unit – Biological Processes in Human Body

### Learning outcomes-

1. State what digestion is?
2. Explain the functions of the parts of the human digestive system
3. List out the products of digestion and the enzymes responsible for such digestion
4. Forward diseases related to digestive system and preventive methods for each disease
5. Do simple activities to explain the external respiratory mechanism
6. State what excretion is
7. List out excretory products and parts of the excretory system
8. Forward the diseases related with blood circulatory system and the preventive measures of those diseases

### Activity – 11.6.1 Does a digestion take place in the buccal cavity

- Stay few minutes, not chewing little amount of rice in mouth.
- Find approximately the time taken to feel sweetness.
- Wash the mouth properly and stay few minutes. Again have the same amount of rice and chew.
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Answer the following questions, by using the observations you obtained in two instances.

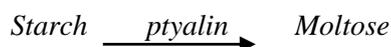
1. In which instance you feel the sweetness with in shorter period of time?
2. How do you name the process of digestion in the buccal cavity by teeth?
3. Somebody recited chemical digestion starts in the buccal cavity. Which enzyme is facilitated for that in Saliva?
4. Complete the following chart relevant to the digestion of the above enzye.

Starch  $\xrightarrow{\quad ? \quad}$  .....



### For your knowledge

- ❖ Food digestion and absorption of digested food are done by the digestive system.
- ❖ Food digestion takes place as physical and chemical digestion.
- ❖ Physical digestion starts in the buccal cavity by teeth. Chemical digestion takes place in several places in the digestive system starting from mouth.
- ❖ Physical digestion makes the chemical digestion easier. (speeds up)
- ❖ Ptyalin (salivary amylase) digests starch in the mouth to maltose (simple sugar)



## 11.6.2 Demonstrate peristalsis movements

1. Provide a glass ball (jill ball) and a rubber tube. Glass ball should be little bigger than the hole of the rubber tube you found.
2. Insert the jill ball to the rubber tube and pressure that by hand, downward.
3. Make the jill ball move downward by hand slowly.

Answer the following questions by the experiences you gained by the activity and the knowledge you gain when do the lesson.

1. The rubber tube you used for the activity is equivalent to a particular part in the digestive system. Name that part.
2. From which place to which place this digested food, transferred in the digestive system?

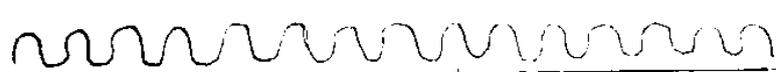
### For your knowledge

- Oesophagus locates from the mouth to stomach.
- Food transferred in oesophaqus by peristalsis movements
- Movements in the muscular wall of oesophaqus push the food bollus down by the constructions and relaxations.

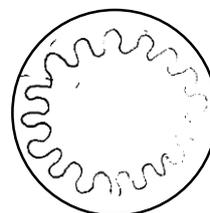


### 11.6.3 Demonstrate villi, which increase the internal surface area of the small intestine

- Take a ribbon of cardboard of length 6 inches and breath 2 inches.
- Take a colour paper ribbon cut by an A<sub>4</sub> sheet having 15 inches length and 21 inches breath



- Paste the colored paper on the cardboard
- Paste the above creation as follows



Answer the following questions by using the experiences you gained through the activity and the knowledge you gain in the class room.

1. Why the surface area being increased by the villi in the small intestine?
2. What adaptations you studied, to increase the efficiency of food absorption in the small intestine?

#### For your knowledge

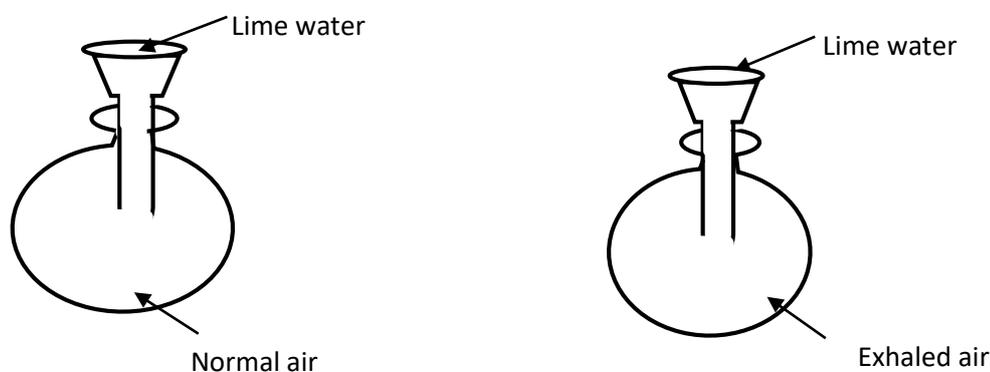
- ❖ *Final products of digestion are absorbed to the digestive system, in the small intestine.*
- ❖ *There are lot of adaptions to increase the efficiency of absorption in the small intestine.*
  - *Villi locate on the walls of small intestine*
  - *Microvilli locate on the villi*
  - *Having very thin walls in villi*
  - *Have good vascular system to villi*
  - *Presence of lengthy small intestine*



### 11.6.4 Does exhaled air consist more CO<sub>2</sub> than inhaled air or less?

#### Method :-

- Take two transparent polythene bags of same size.
- One bag should be filled with an atmospheric air and tight it.
- Blow exhale air to the other bag as the same amount of filled water to other bag and tight.
- Add little amount of lime water to both bags according to the diagram.



Answer the following questions by the observation and knowledge you gained

1. How a sample of lime water is prepared?
2. What is the initial colour of lime water?
3. In the above experiment, more milky colour obtained from,
  - the where it contains normal air
  - the where it contains exhaled
4. What is the conclusion?
5. Write the chemical equation for the colour change of lime water

#### For your knowledge :-

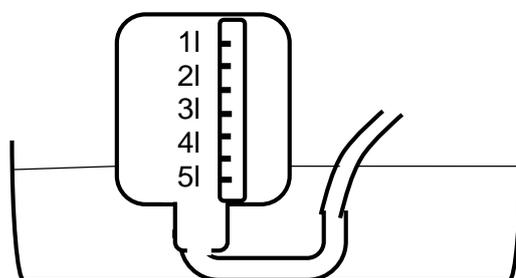
- ❖ Gaseous by product released by the exhaled air is CO<sub>2</sub>
- ❖ Because of this reason exhaled air contains more CO<sub>2</sub> concentration than inhaled air
- ❖ CO<sub>2</sub> gas can be identified by the colour change of lime water from colourless to milky colour.



### 11.6.5 Do you know the volume of air retain in your lungs. Find.

#### Method :-

- Take empty water bottle
- Paste a strip of paper on the bottle.
- Take a bottle that can fill 1l volume.
- Take 1l of water to the bottle with the capacity of 1l and transfer that volume to 5l bottle mark the level of water on the paper, pasted.
- Add another 1l of water to the same volume in 5l bottle. Mark the final level of water on the paper strip.
- Add till 3l, 4l and 5l and mark each on the paper strip else it as the scale.
- Separate equal distance of the marked scale as your wish and make it more convenient paste a cello tape strip on the paper scale and cover the scale properly.
- Fill 5l bottle fully by water and invert that in a water basin.
- Arrange the setup as follows by fixing a rubber tube.



- Take a heavy breath to fill lungs. Blow air in to the bottle as maximum you can.
- Find the volume of air in the bottle approximately by observing the final water volume indicated in the scale.
- The volume of that air approximately equal to the capacity of your lungs.

Answer the following questions by the knowledge gained by observations and in the class room.

- 1 Does the volume of lungs vary with the age of a person@
- 2 Does the volume of lungs vary with the gender@
- 3 What activities you can do to increase the volume of lungs



For your knowledge :-

- ❖ *Volume of air inside lungs vary according to age and gender.*
  
- ❖ *Less volume of air exhaled than inhaled air by a man. That means a little volume of air retain in lungs*

11.6.5 Report activities and industries which cause respiratory diseases to human.

For your knowledge :-

- ❖ *Smoking affects more for the respiratory System*
- ❖ *Smoking is two fold, active and inactive.*
- ❖ *If you don't smoke, it is inactive smoking. When you are close by to a person who smokes.*
- ❖ *By smoking ,*
  - *distort lungs*
  - *damage heart*
  - *distorted child birth and infant death.*
  - *Diabetics*
  - *Optical/visual disorders*
  - *diseased skin.*

*Like diseases affect for the whole body of a human.*

**11.6.6 Find substances dissolved in water emit from the body by sweat or urine**

- Take a glass slide and put a drop of sweat or urine on to the slide.
- Heat the glass slide, slightly by holding on fire of a spirit lamp or a bunsen burner (Hold over the flame of the gas cooker at home )
- Examine whether white powder remains on the slide when the water gets evaporated from the slide after sometime.



Answer the following questions by the experience you gained through the activity and the knowledge in the classroom

1. What excretory substances can be contained in urine @
2. What excretory substances can be contained in sweat@

### **11.6.7 Attention on blood testing**

Prepare a file containing the reports taken by a doctor when investigating discuses related to blood and blood circulatory system.

Ex. ECG.

- Blood glucose (HB A/C)
- Cholesterol (lipid profile)
- Liver blood tests
- Full blood count (FBC)
- Group save test (or Group and screen)
- Urea and Electrolytes (U and E)
- Brain Natrioretic peptide (BNP)



## Evaluation

Answer the following questions.

2016, 2017, 2018, 2019 and 2020 O/L questions related to;

- Digestive system of man
- Respiratory system of man
- Excretory system of man
- Blood circulatory system of man
- Coordination and homeostasis in man

Excretion of human

Year	MCQ	Structured Essay	Essay
2016			
2017	03	01 (v)	
2018	06		
2019			
2020			

Coordination and homeostasis

Year	MCQ	Structured Essay	Essay
2016			(8) A, J, II, III, IV
2017	15.26		(5) A, V
2018			(5) A, I, III, B, I, II, III
2019			

