

# STRONG TOWER ACADEMY

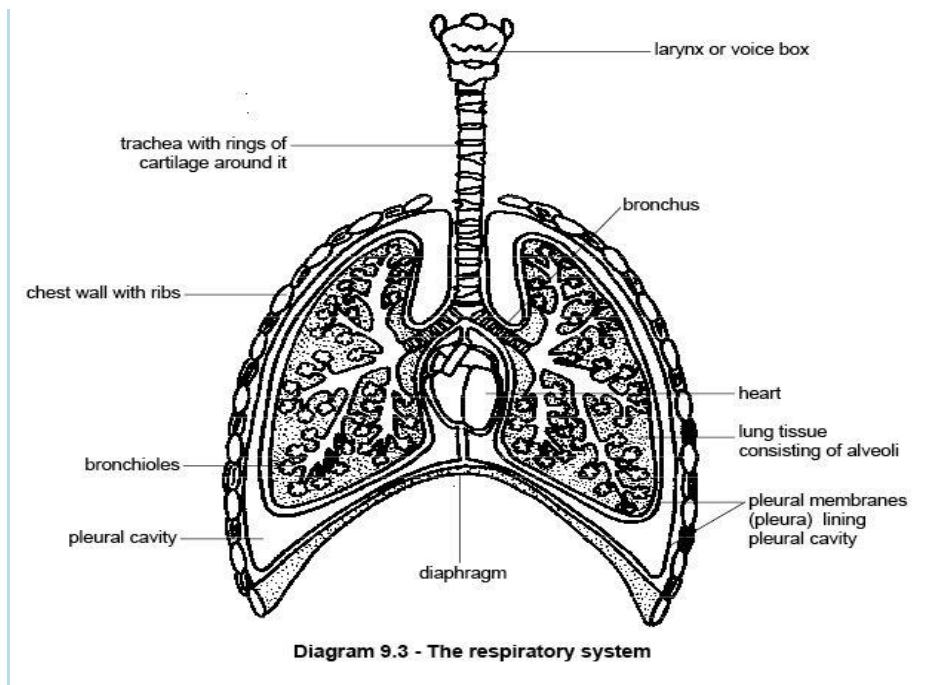
SS1 AGRIC SCIENCE

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## RESPIRATORY SYSTEM

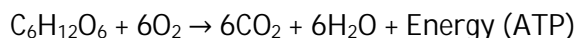
The respiratory system includes all the organs and tissues associated with the exchange of gases between the animal and its environment leading to the release of energy. The components of the respiratory system include the trachea and the lungs.

In animals, air enters the body either through the mouth or the nostrils. A short pathway opens into the pharynx, and branches at the end into two directions. One leads to the digestive tract and the other to the larynx (voice box) and the lower air pathways. During swallowing, a flap (epiglottis) covers the glottis to prevent food from entering the air pathways. The larynx leads to the trachea (wind pipe) which branches into the bronchi (sing. bronchus) which are the air tubes that enter the lungs. Each bronchus branches repeatedly within the lungs to form smaller air tubes called bronchioles. Very fine branches of the bronchioles called alveoli (sing. alveolus) form the surface for gaseous exchange. The alveoli have one-cell thick, elastic walls. The movement of O<sub>2</sub> through all the organs mentioned earlier finally ends in the alveoli inside the lungs, where exchange of gases (O<sub>2</sub> and CO<sub>2</sub>) takes place

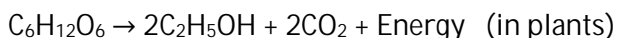


### Types of Respiration

1. Aerobic: this is respiration which takes place in the presence of O<sub>2</sub>. This is the type possessed by all farm animals. This can be expressed by the following equation:



2. Anaerobic: this is the respiration that takes place in the absence of  $O_2$ . When glucose is broken down, it releases lactic acid and energy in animals. But in plants, the end products of anaerobic respiration are alcohol,  $CO_2$ , and energy. This process is also referred to as Fermentation.



## BREATHING

During breathing, air flows from the nostrils to the pharynx, to the larynx then to the bronchus to the bronchioles and alveolus then finally to the lungs.

Nostrils → Pharynx → Larynx → Bronchus → Bronchioles → Alveolus → Lungs

Breathing involves two processes which are:

- ♣ Inspiration (inhalation or breathing in)
- ♣ Expiration (exhalation or breathing out)

ASSIGNMENT: State seven differences between inspiration and expiration.

### DIFFERENCES BETWEEN INHALED AIR AND EXHALED AIR

GAS	INHALED AIR (%)	EXHALED AIR (%)
Oxygen	21	16
$CO_2$	0.03	4
Nitrogen	79	79
Water Vapour	Variable	Variable
Rare gases	Variable	Variable

### IMPORTANCE OF THE RESPIRATORY SYSTEM

1. It supplies  $O_2$  to the body cells.
2. It can help reduce heat load in the body especially in poultry.
3. It removes  $CO_2$  from the body.

# NERVOUS SYSTEM

This is the system by which activities surrounding the animal's body coordinate to perform specific actions. It is also a system concerned with the ability of the animal to respond to stimuli or changes in the environment. It is divided into two:

- ♣ Central Nervous System (CNS)
- ♣ Peripheral Nervous System (PNS)

The **CENTRAL NERVOUS SYSTEM** consists of the brain and the spinal cord. They both help in coordinating the activities in both the internal and external environment.

The Brain: It is divided into three parts:

- Fore brain: consists of the olfactory lobe and the cerebrum
- Mid brain: consists of the hypothalamus, the optic lobe, etc.
- Hind brain: consists of the cerebellum and medulla oblongata.

Parts of the brain	Functions
Cerebrum	Responsible for intelligence, voluntary actions, memory, learning ability, speech, reasoning (imagination)
Olfactory lobe	Interpretation of smell
Hypothalamus	Controls water balance, hunger, sleep, etc.
Optic lobes	Ensures sight
Cerebellum	Controls body movement and also maintains body balance
Medulla oblongata	Controls respiration, digestion, heart beat etc.

**The Spinal Cord:** begins from the end of the medulla oblongata, passes through the vertebral column and ends at the caudal vertebra. The spinal cord controls all involuntary actions and also works with the brain by transmitting and receiving impulses from it.

The **PERIPHERAL NERVOUS SYSTEM** comprises the Somatic and the Autonomic Nervous Systems. The Somatic Nervous System is also called the Body Cell System. It controls all the skeletal movements.

The Autonomic Nervous System comprises:

- ✓ Sympathetic system: coordinates the body systems such as acceleration of heartbeat, contraction of the bladder etc. It also induces ejaculation, inhibits secretion of saliva etc.

- ✓ Parasympathetic system: coordinates body functions such as decreasing the heartbeat, increasing the secretion of saliva, contraction of the pupils etc.

NEURONES: These are the functional unit of the Nervous system. They are:

1. Sensory/Afferent Neurones: transmit impulses from the receptors (i.e. organ/cell that receives the impulse) to the CNS.
2. Intermediate Neurones: a.k.a. Association Neurones. They connect the Sensory and the Motor Neurones.
3. Motor/Efferent Neurones: transmit impulses from the CNS to the effector (i.e. organ/cell that carries out the response)

ACTIONS: These are divided into two namely:

- a. Reflex/involuntary actions: are actions carried out by the animal without thinking i.e. it is rapid and automatic in reaction. e. g. coughing, sneezing, blinking of the eye etc.
- b. Voluntary actions: are actions which an animal thinks about first before doing e.g. running away from an enemy.

#### FUNCTIONS OF THE NERVOUS SYSTEM

1. It coordinates body functions
2. It is responsible for bringing about locomotion

It enables the body to respond to external stimuli.