



Arab Republic of Egypt  
Ministry of Education &  
Technical Education  
Central Administration of  
Book Affairs

# Search and Learn

# Science

For Primary Stage

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غير مصرح بقتاله هذا الكتاب خارج وزارة التربية والتعليم والتعليم الفني



# مقدمة

## عزيزي التلميذ / التلميذة

يسعدنا ونحن نقدم هذا المنهج لأبنائنا تلاميذ الصف الرابع الابتدائي أن نؤكد على أن تعلم العلوم متعة وبهجة، متعة في القيام ببعض الأنشطة العلمية البسيطة، وبهجة فيما يمكن الوصول إليه من نتائج. فتعلم العلوم يعتمد على الملاحظة والتفكير والتجربة واستخلاص النتائج. وقد تم اختيار عنوان لهذا المنهج يعكس فلسفته: وهو «ابحث وتعلم».

وقد شارك في إعداد هذا المنهج مجموعة من المتخصصين في المناهج وطرق تدريس العلوم والخبراء وال媢جهين والمعلمين، كما تم فيه تجربة الاستعارة بمجموعة من تلاميذ المرحلة المستهدفة تأكيداً لفلسفة المنهج من حيث مراعاة طبيعة المرحلة العمرية وطبيعة المعرفة والمجتمع.

ويهدف هذا المنهج إلى مساعدة التلميذ على إدراك العلاقة بين العلم والتكنولوجيا ورؤية العلم من منظور شخصي ومجتمعي وفهم تاريخ وطبيعة العلم وتنمية مهارات التفكير العليا وأمتال المفاهيم العلمية الأساسية. ولتحقيق هذه الأهداف تم استخدام أسلوب علمي تقدم فيه المفاهيم في شكل وحدات دراسية في ترابط منطقي مع بعضها البعض وتكامل مع المواد الدراسية الأخرى. كما أن الموضوعات المتضمنة في هذا المنهج تتناول المفاهيم الرئيسية في مجالات الكائنات الحية والمادة والطاقة والفلك مما يساعد على تشجيع البحث والاستقصاء العلمي.

ويتضمن الفصل الدراسي الثاني وحدتين لكل منهما عنوان يدل على محتواها. فقد جاءت الوحدة الأولى بعنوان الكائنات الحية والوحدة الثانية بعنوان القوة والطاقة. وتشمل كل وحدة مجموعة دروس مترابطة ومتكاملة.

**يعتمد المنهج على إثارة رغبة التلاميذ والللميدات في المعرفة والتعلم، والاستفادة من الخبرات المحيطة بهم من كل جانب وذلك من خلال الاعتماد على الأنشطة والتدريبات المتنوعة.** كما يعتمد المنهج على استراتيجيات التعلم النشط في تنفيذ دروسه، ولذلك تم تزويد الدروس بمصادر المعرفة ووسائل التكنولوجيا الحديثة بما يشجع مهارات البحث والتعلم الذاتي وتنمية مهارات التفكير الناقد ومساعدة التلميذ على التأمل والتقييم الذاتي فيما يدرسه ويتعلمه، وتكوين ملف الإنجاز الخاص به بما يتفق وفلسفة التقويم الشامل.

ونحن إذ نقدم هذا الكتاب نرجو الله أن يحقق الفائدة منه.

والله ولـى التوفيق

**المؤلفون**

# Contents

## Unit One



## Living Things

1- Human Digestive System	7
2- Human Respiratory System	16
3- The cell .. The building unit of Living organism.	25
4- The importance of sunlight to Living organisms .	34
• General Exercises on Unit (1)	43

## Unit Two



## Energy and its Forms

1- Forms of Energy and their Changes	49
2- The Electricity	61
• General Exercises on Unit (2)	72

## Unit One

# Living Things

- Structure and function in living organisms.
- Levels of organization in organisms bodies.

## Unit Lessons

- 1- Human Digestive System
- 2- Human respiratory System.
- 3- The Cell ..The building unit of Living organism .
- 4- The importance of sunlight to living organisms.

Living organisms depend on each other in the environmental systems.

# Objectives

**By the end of this unit, a student will be able to:**

1. Identify some systems of the human body.
2. Name the Biological functions of the human body systems.
3. Infer the integration among the living organism body systems.
4. Examine a model for the digestive and respiratory systems.
5. Identify the functions of digestive and respiratory systems organs.
6. Show the importance of a human keeping to his body.
7. Have his classmates conduct right behaviors in feeding.
8. Identify the levels of organization of the living organism body.
9. Show that the cell is the building unit of living organisms.
10. Examine the animal and plant cells.
11. Compare an animal cell to a plant one.
12. Use the magnifying lens and Compound microscope for examining cells.
13. Explain the role of the sun in photosynthesis process.

**1****LESSON ONE**

# Human Digestive System

## Lesson Objectives

**By the end of the lesson, a student will be able to:**

1. Identify some human body systems and their importance.
2. Recognize the concept of digestion.
3. Name the digestive system organs.
4. Determine the function of each organ of the digestive system.
5. Identify the function of the digestive juices.
6. Conclude the role of digestive juices.
7. Examine a digestive system preliminary model (torso).
8. Draw a simplified diagram for the digestive system.
9. Show the importance of food for human body.
10. Give suggestions to his classmates in order to keep their digestive systems healthy.

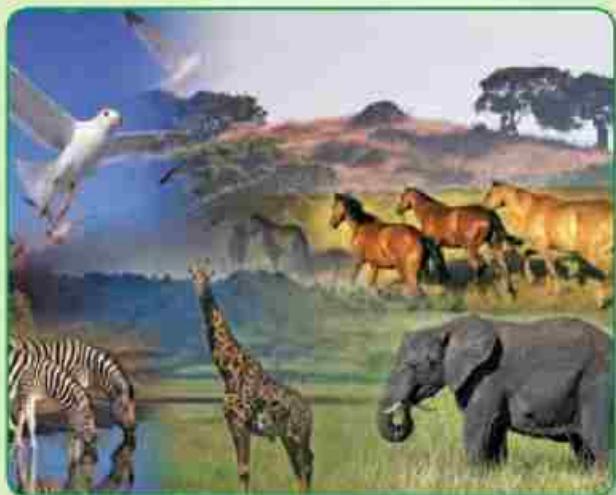
### Lesson Items

- Studying some human body systems.
- Digestive system structure.
- Digestive system functions.

### Life Issues

- General health

We are surrounded by countless number of living things which all have common properties and characteristics such as nutrition, transport, respiration, excretion, motion, sensation, reproduction ..These properties are performed via specialized systems within the living organism body to assist his existence and survival.



## The structure of the living organism body

A living organism body consists of a set of systems, these systems can be obviously shown through the studying of some human body systems.

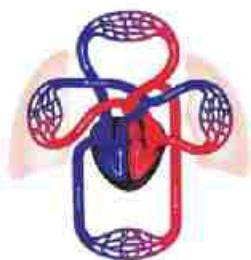
### Activity (1) Human Body Systems

Work with your classmates using some photos to the human body systems then write the name of the suitable system in front of its proper function to complete the following table.

	Function	System's name
1	Nutrition and Digestion	..... system
2	Distribute the digested food and oxygen all over the body.	..... system
3	Respiration	..... system
4	Get rid the body of harmful substances.	..... system
5	The ability to feel , hear and smell.	..... system



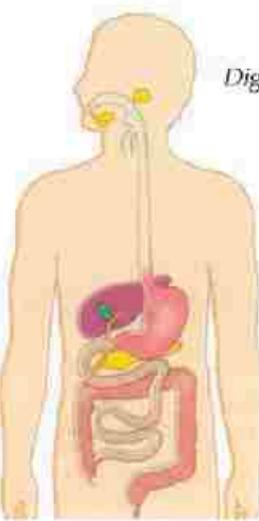
Urinary System



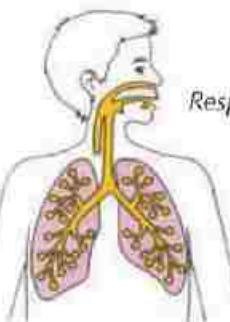
Circulatory System



Nervous System



Digestive System



Respiratory System

The human body is made up of a number of systems. Each system performs a certain function. For example, the digestive system digests and absorbs food, the respiratory system carries out the process of breathing and the circulatory system distributes the digested food and oxygen all over the body cells. The urinary system helps the body get rid of harmful substances, the nervous system lets us have the ability to feel, hear, see, smell, and taste, whereas the reproductive system makes us give birth for new individuals who will look like us. And all these systems are working in full harmony and integrity together to keep the human life goes on.

Let's study the digestive system together to know How this system are structured.

## The Human Digestive System

When you sit with your classmates having your breakfast.....

Have you ever asked yourself where this food goes? And what is happening to it?



The food you have had such as bread, cheese, jam and beans is in a complex form. During its journey through the digestive system, it completely changes into a simple form to let your body be benefited.

**Digestion:** Changing the food from a complex form into a simple one to let the body get benefited.

### Activity (2): Digestive System Structure

The opposite figure shows the digestive system. Recognize its contents then write them down.

A-The contents of digestive system are:

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....

B-Digestive canal supplementaries are:

1. ....
2. ....
3. ....



Digestive system in human being

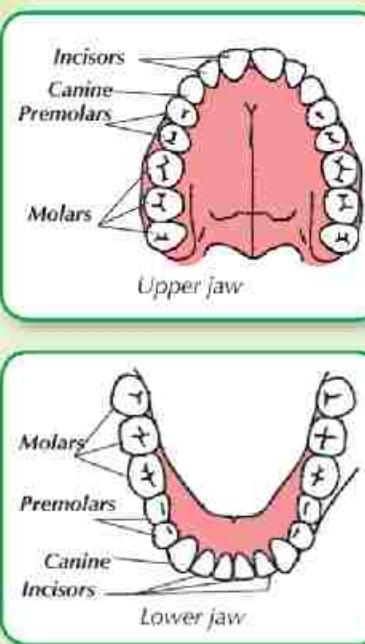
Digestive system in a human being is made up of a set of organs which contact with each other in a shape of a long pipe (duct) known as the digestive canal with length of 9 - 10 m. This canal starts with the mouth and ends in the anus. Three types of glands are connected with this canal: the salivary glands, the liver and the pancreas. These glands are called the digestive canal supplementaries.

## (1) Mouth

The mouth is a cavity in where teeth and tongue are existed and the salivary glands open to it as well.

### • Teeth

The teeth number in an adult are 32, each jaw has 16 teeth divided into (4 incisors, 2 canines and 10 molars).



- Incisors and canines cut and tear food into small pieces, where molars grind the food to ease its swallowing process.

### • Tongue

It turns food inside the mouth cavity and mixes it up with saliva assisting the process of food swallowing and tasting.

### • Salivary glands

They are three pairs of glands secrete a liquid known as the saliva which contains digestive substances called enzymes that digest starches, then convert them into simpler substances known as sugars.



### Read and Learn

#### Milk teeth:

Are weak teeth, formed through the childhood phase in a number of 20 teeth (ten teeth in every jaw, divided into 4 incisors, 2 canines and 4 molars). These teeth are completely replaced by strong ones before the age of twelve.



### Read and Learn

The tongue has several functions. It is the speech organ since it changes the sound coming from larynx into understandable words.



### Read and Learn

#### Mumps

Is a viral disease infects the salivary gland which is located under the ear causing its inflammation.

## (2) Pharynx

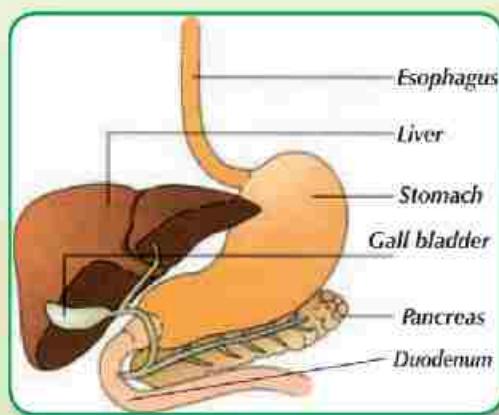
It is a common cavity between digestive system and respiratory system and leads to the trachea and esophagus.

## (3) Esophagus

It is a muscular tube that the food travels through from your pharynx to your stomach.

## (4) Stomach

A muscular sac works on mixing food up by its digestive juices. After a few hours food changes into semi - liquid substance, in where an incomplete digestion of protein takes place by a gastric juice, then food travels to the small intestine.



## (5) Small intestine

Its length is about seven meters, it coils inside the abdominal cavity. It starts with a part known as duodenum where the bile juice (secreted by liver) and pancreatic juice (produced by pancreas) are poured in. Duodenum is followed by a part of the small intestine known as ileum, where the digestion to different types of food is completed.

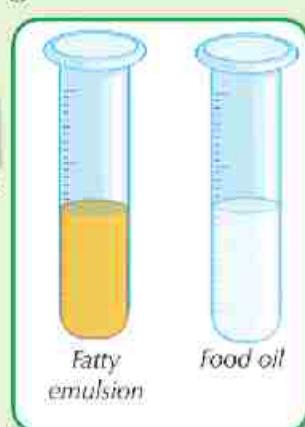
### Activity (4): Bile Juice Function

Materials Test tube - some food oil - bird's bile juice

Have a test tube contains an amount of food oil then add some bird's bile juice to it. Shake it well.

What do you observe?.....

Conclusion .....



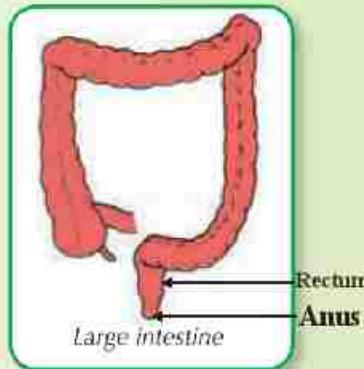
**Bile juice:** helps to digest fats where it changes fats into a small molecules that are easily blended with water (fatty emulsion).

## • Absorption

Digested food is absorbed through small nipples called villi that found in the small intestine walls then it reaches blood which distribute it all over the body organs.

## (6) Large Intestine

It starts from the end of small intestine ending in the anus which is located at the end of the rectum. Water is absorbed in rectum from food remains, then these wastes are ejected outside the body through the anus.



### Exercise

Work with your classmates in a team representing the digestive system organs and each classmate describes what is happening to food when passes through him.

### Keeping The Digestive System Healthy

To keep your digestive system healthy, you have to follow the following instructions:

- 1- Chew the food well.
- 2- Don't eat much food that contains large amounts of fats such as fast meals.
- 3- Skip having food containing the additive compounds and flavourings.
- 4- Skip buying food from streets to avoid infectious diseases.
- 5- Practice sports regularly.
- 6 - Stay Away From Smoking Because it causes Indigestion, Stomach and Duodenal Ulcers.



### Read and Learn

Process of digestion requires great amount of water because water helps to break down the complex food substances into simpler substances which the body gets benefited from.



### Read and Learn

#### Importance of food

- 1- Carbohydrates and fats supply the body with energy.
- 2- Proteins help body to grow and act for healing wounds.
- 3- Vitamins protect human from getting infected by diseases.



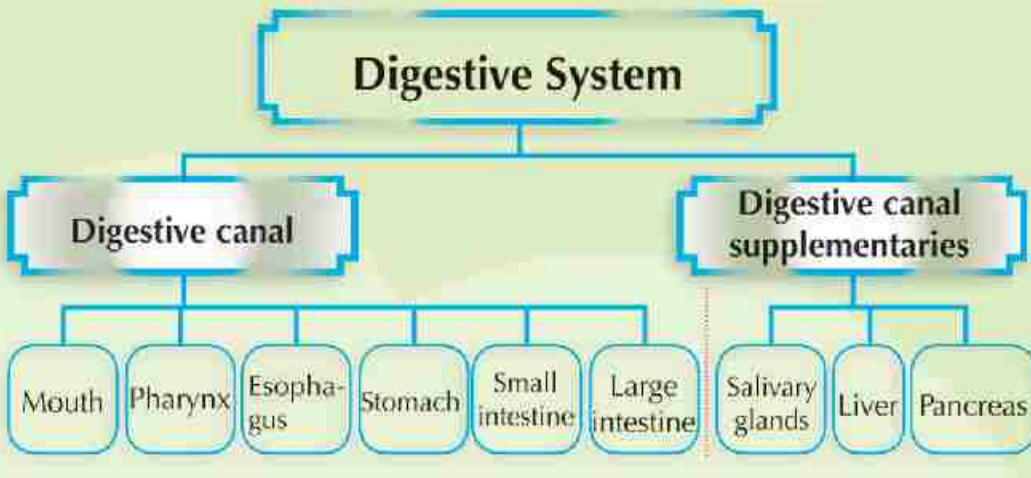
## Optional Activity

Choose one of the following activities and perform it.

- Shortly write about food journey inside your body.
- From the materials in your environment, design a model of the digestive system.



## Summary



## Exercises and Activities

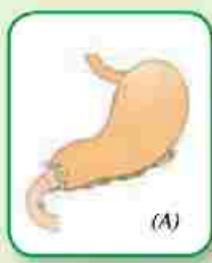
**Question 1:** Choose the right answer

- 1- Digested food is absorbed in the .....
 

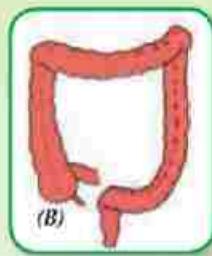
(a) esophagus	(b) stomach
(c) small intestine	(d) large intestine
- 2- Starches digestion starts by the.....
 

(a) gastric juice	(b) intestinal juice
(c) saliva	(d) bile juice

**Question 2:** Figure (A) shows a part of the digestive system known as .....



**Question 3:** Figure (B) shows a part of the digestive system Known as .....

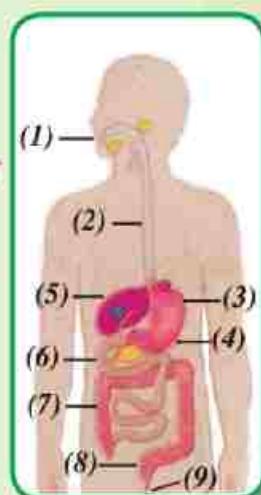


**Question 4:** Which of the following is a correct statement.

- A- Gastric juice digests fats.
- B- Saliva digests protein.
- C- Bile juice helps to digest fats.

**Question 5:** Label the opposite figure then answer the following:

- A- Name the organs where starches are digested in.
- B- What is the benefit of the stomach?
- C- What is the organ that secrete a bile juice?



**Question 6:** Look at the figure, then complete

- A- Protein digestion starts in .....
- B- Starches digestion starts in .....
- C- Fat digestion starts in .....

**Question 7:** What is the advice that you should give your classmates to keep their digestive system healthy?



#### Self reflection and Self evaluation

My dear student: After you have studied the digestion and the digestive system, fill in the following card.

- A- What are the parts you like in the lesson?
- B- What are the parts you didn't like in the lesson?
- C- What is the problem you faced during the performance of the previous activities?
- D- What are the benefits you gained by studying the digestive system?

## 2 LESSON Two

# Human Respiratory System

### Lesson Objectives

**By the end of the lesson, a student will be able to:**

1. Identify what respiration means.
2. Name the respiratory system organs.
3. Draw a simplified diagram of the respiratory system.
4. Perform experiments show the respiration mechanism.
5. Indicate the relation between the human digestive and respiratory system.
6. Highlight the harms of environmental pollution and smoking on the respiratory system health.



#### Lesson Items.

- Structure of respiratory system.
- Function of respiratory system.



#### Life Issues

- Addiction: Reasons and protection.

Man requires the process of respiration to get the needed energy from nutrients in order to enable the body systems doing their different functions such as transport, motion, excretion, sensation

...etc



### Activity (1): Structure of Respiratory System

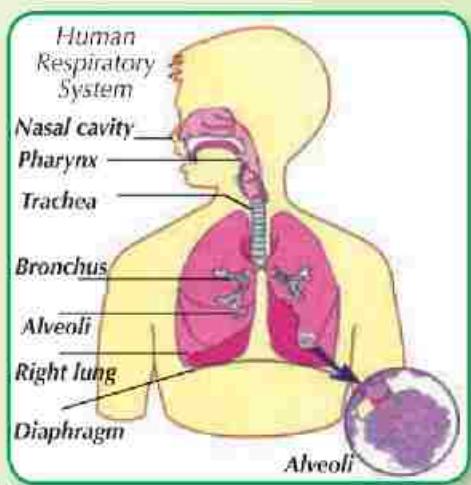
The opposite diagram shows the respiratory system. Identify its components then write them down according to their order in the diagram.

1. ....
2. ....
3. ....
4. ....
5. ....

Respiratory system consists of the nose, pharynx, trachea, the two bronchi and the two lungs

#### (1) Nose

It is lined with a mucous layer and hair to obstruct and filter dust and microbes before the entering of air into the lungs. It also contains blood capillaries (tiny blood vessels) to warm the air as it passes through.



#### Read and Learn

Inhaling through the mouth causes human infection with many thoracic diseases.

## (2) Pharynx

A common cavity between digestive system and respiratory system leads to the trachea and esophagus.

## (3) Trachea

- Trachea is a tube supported with incomplete cartilaginous rings that make it permanently open and it is also lined with cilia to eject up the strange objects.
- At the top of trachea there are the larynx (voice box) and epiglottis which closes off the opening of trachea during swallowing, this forbids food from entering the trachea.
- The bottom of the trachea branches into two narrow tubes called bronchi which enter the lungs.



## (4) Lungs

Bronchus is divided into bronchioles inside each lung ending in alveoli which is surrounded by a network of blood capillaries in where gas exchange occurs.

The two lungs occupy the thoracic cavity and they are anteriorly surrounded by the ribs. Diaphragm separates the thoracic cavity from the abdominal cavity.



### Read and Learn

We inhale the atmospheric oxygen by the two lungs, whereas the fish inhales the dissolved oxygen in water by gills.



### Activity (2): Respiration

Find how many times of respiration of your classmate during a minute (use a stop watch) in each of the following cases:



(1)



(2)



(3)

- 1- While sitting.
- 2- While walking.
- 3- During running.

Record how many times he respires per a minute in each case in the opposite table.

- Describe the motion of your classmate's chest during respiration in each case.....

Conclusion .....

Position of the body	Times of respiration per minute
- Sitting	
- During walking	
- During running	

**Respiration:** is the process carried out by human in order to get energy from burning of the digested food.

- The more active your body is, the more your respiration times increases.

### Activity (3): Mechanism of Respiration

Try to perform the following experiment with a classmate in order to understand the mechanism of respiration.

■ **Materials:** a plastic bottle - two balloons - scissors - an adhesive Tape

- a rubber membrane - a tube with two branches
- Cooperate with your classmate to design a model represents the two lungs as shown in the figure.
- Pull the rubber membrane which represents the diaphragm down.

What do you observe? .....



Inhalation

- Release the rubber membrane to turn back to its original position.

What do you observe? .....



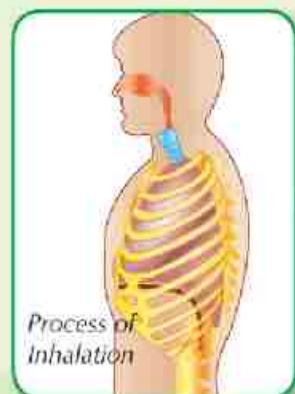
Inhalation

Conclusion .....

The air enters to the two balloons when pulling the rubber membrane down and the air exits when releasing the membrane up, interpret the inhalation and exhalation processes in a human being.

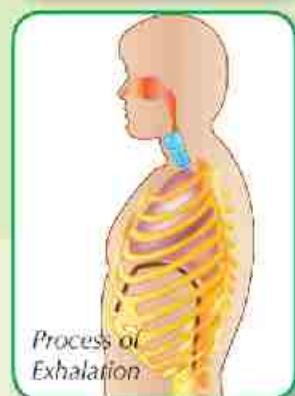
### Process of inhalation

- The diaphragm muscle contracts and moves down and the thoracic cavity enlarges.
- The air rich in oxygen enters the two lungs through the nasal passage



### Process of exhalation

- The diaphragm muscle relaxes and moves up and the thoracic cavity becomes narrow.
- The air rich in carbon dioxide moves outside the lungs through the nasal passage.



### Exchange of gases

Exchange of gases occurs between the air existed in alveoli and the blood flows in the capillaries via their thin walls where blood leaves carbon dioxide and carries the oxygen and distributes it all over the body cells.



#### Read and Learn

Lungs are out of muscles, so they can't shrink or relax alone, but this shrinking and spreading out are done through muscles located between the ribs of thoracic cavity and the diaphragm muscle.

### Components of exhaled air

#### Activity (4): Detecting carbon dioxide in exhaled air

- **Materials:** A test tube - clear lime water- a thin tube

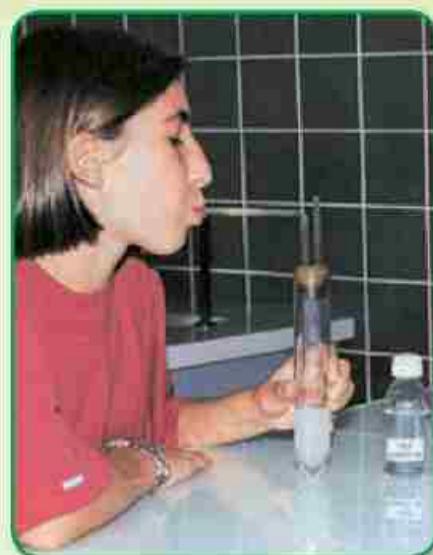
### ■ Procedures

- Blow the air gently through the tube in the cup which contains clear lime water.
- Continue in blowing air for two minutes.

What do you observe? .....

Conclusion .....

The turbidity of lime water is an evidence for the presence of carbon dioxide in the exhalation air.



### Activity (5): Detecting for water vapour in the exhaled air

Bring a mirror or a glass sheet and place it in front of your mouth then exhale on its surface.

What do you observe? .....

Conclusion .....

Water droplets are formed on the glass sheet and this is an evidence for the presence of water vapour in the exhalation air.



**Exhalation air contains carbon dioxide and water vapour as products of respiration process.**

## Keeping the respiratory system healthy

To Keep your respiratory system healthy you should stick to the following:

- 1- Skip being in crowded or poor ventilation places.
- 2- Keeping off the severe cold.
- 3- Eating fruits rich in vitamin (c) such as oranges, guava to protect yourself from cold.
- 4- Stop smoking or being a passive smoker, because it leads to cancer causig death.



## Optional Activities

Choose one activity from the following ones carry it out.

- 1- Write a short brief about the air journey till the entrance to the lungs and alveoli.
- 2- Design a model for the respiratory system using materials from your environment.
- 3- Smoking is considered a reason of why the respiratory system gets infected by cancer.

How can you advise one of your smoking relatives to stop smoking?



## Summary

### Human Respiratory System

Consists of

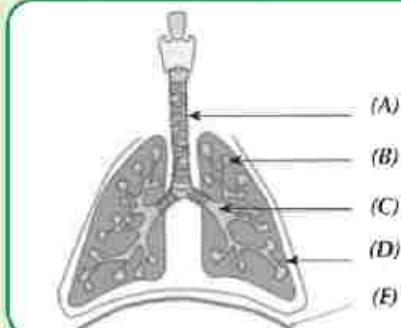


- **Respiration:** is the process by which human can get energy from burning of the digested food .
- Exhalation air contains carbon dioxide and water vapour.

## Exercises and Activities

**Question 1:** The opposite diagram shows the respiratory system in a human being. Use the words below to complete the table:

Alveoli - Bronchus - Diaphragm -  
Trachea - Lung



Letter	Organ's name	Function
A		
B		
C		
D		
E		

**Question 2:** Complete the following sentences.

- 1- .....muscle helps the mechanism of respiration.
- 2- Exchange of gases occurs in lungs between .....and .....
- 3- Air enters into the lungs during the process of .....and leaves them during the process of .....

**Question 3:** Why is exhalation air considered different from inhalation air? Explain

**Question 4:** Breathing through the nose is preferable than breathing through the mouth. Explain

**Question 5:** Protecting the environment against pollution is an important factor for keeping respiratory system safe. If you face a pollution problem in your environment, how can you solve it?

- Problem: .....
- Your suggestions to solve it: .....
- Use Egyptian knowledge Bank to suggest solving of this problem .
- Ideal solution: .....



### Self reflection and Self evaluation

My dear student, after you have learnt respiration and the respiratory system, fill the next card.

(a) What are the parts you like in the lesson?

.....

(b) What are the parts you didn't like in the lesson?

.....

(c) How much is your overlapping with your classmates in carrying out the activities included in the lesson?

.....



3

## LESSON THREE

# The cell ... The building unit of Living organisms

### Lesson Objectives

**By the end of this lesson, a student will be able to:**

1. Recognize the levels of organization in living organisms.
2. Infer that the cell is the building unit of living organisms.
3. Use the microscope to examine a plant and an animal cell.
4. Compare between the plant cell and the animal one.
5. Examine the yeast fungus.
6. Show the importance of the yeast fungus.



#### Lesson Items.

- Levels of organization in a living organisms.
- The plant and animal cells.
- The yeast fungus.



#### life Issues

- Resources best use, and development.

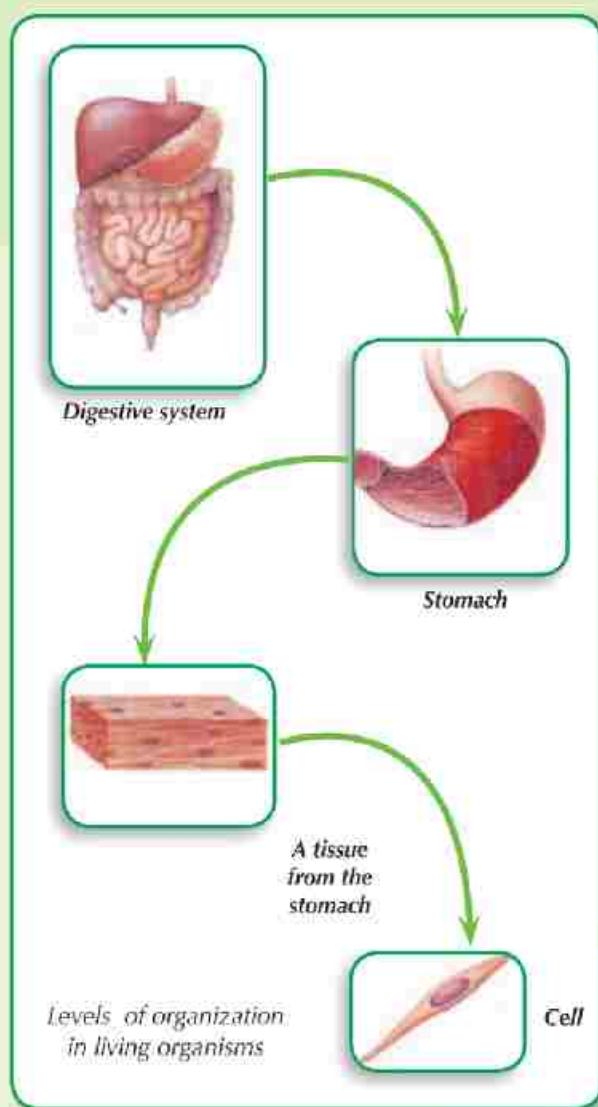
Previously you have known that the body of a living organism consists of a group of systems working integrally together to keep life on, and you have also learnt that both digestive and respiratory systems consists of a set of organs.



## What is an organ made up of?

An organ consists of similar or different tissues, and each tissue is made up of a symmetric set of cells. Plants are also made up of organs such as roots, stems and leaves, each organ is made up of tissues and every tissue is made up of symmetric units known as cells.

Animal cell is the building unit of an animal body and the plant cell is the building unit of a plant.



## Activity (1): Plant cells examination

- **Materials:** an onion plant - forceps - a magnifying lens - microscope - a glass slide

### ■ Procedures

- Remove an internal leaf from the onion plant and try to remove the transparent epidermis from a part of this leaf using the forceps.
- Use the magnifying lens to examine the onion leaf epidermis.
- Describe what do you observe.  
.....
- Know how to use the microscope from your teacher.
- Put the onion leaf epidermis on the glass slide and add a drop of water on it.
- Check the slide by using the microscope.
- What do you observe? .....



Steps of a plant cell examination

Conclusion: .....



Plant cell



Plant tissue

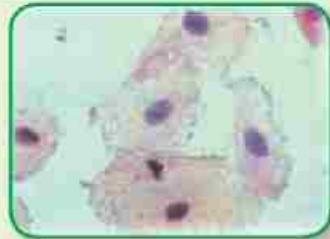
The epidermis tissue of the onion plant leaf consists of similar units known as the plant cells.

## Activity (2): Animal cells examination

■ **Materials:** A mouth lining membrane ready made slide - microscope.

### ■ Procedures

- Check the slide by using the microscope.  
What do you observe? .....
- Conclusion: .....
- The mouth lining membrane is made up of similar units known as animal cells.



Mouth lining tissue

**The cell** is the building unit of the living organism's body.

## The cell simplified structure

All cells are units contain:

- 1- **Nucleus:** organizes the biological operations inside the cell and it is responsible for cell division.
- 2- **Cytoplasm:** Fill the space and biological operation are acted by it.
- 3- **Plasma Membrane:** surrounds the cell and controls the substances entering into the cell or leaving it.



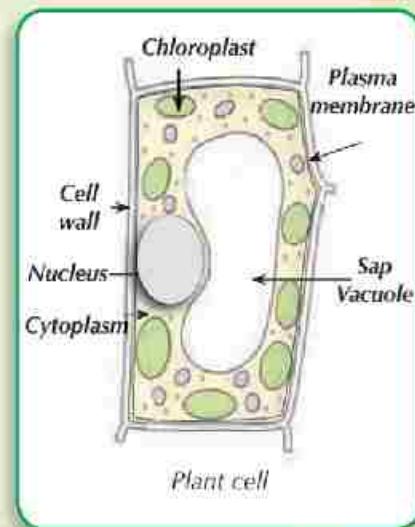
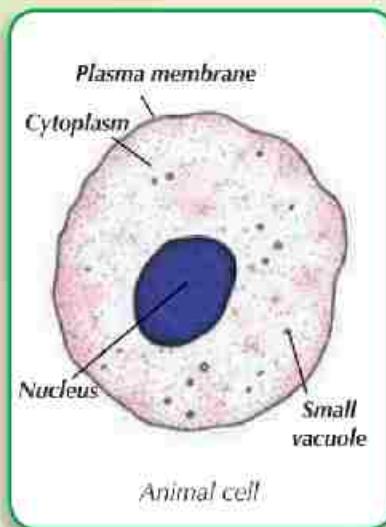
### Read and Learn

Cells are units that differ in shape and size according to their locations and functions. The tissue cells are similar in shape and functions, but, they differ from other cells. For example, stem cells in plants differ from the leaf cell and your skin cells differ from your muscular cells, as well as the cells of plants differ from cells of animals.



### Activity (3): Comparing between a plant cell and an animal one

- Recognize the contents of both the plant and animal cells in the next diagram then conclude the difference.



- Put (✓) in front of the part which is existed in the animal or the plant cell in the next table:

Cell parts	Plant cell	Animal cell
1- Cell wall		
2- Plasma membrane		
3- Nucleus		
4- Cytoplasm		
5- Chloroplasts		



#### Read and Learn

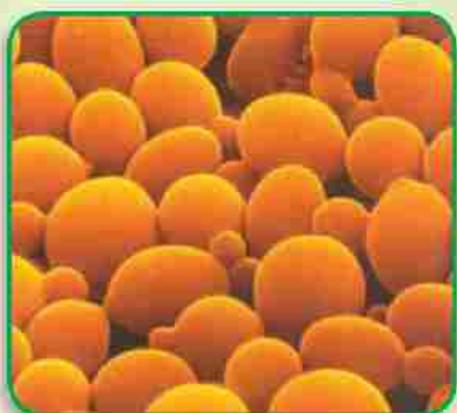
On examination the animal and the plant cell by using the compound microscope we can't see all the internal components of the cell since they are very tiny, but after discovering of the electronic microscope scientists become able to see all the cell components.

The plant cell, than the animal one, is characterized by the presence of a cell wall surrounding it and contains chloroplasts which are responsible for making food in a process known as photosynthesis.

## Unicellular organisms

There are a lot of unicellular micro-organisms around us which can't be seen by the naked eye such as bacteria and yeast Fungus.

The unicellular organism is considered as an integrated living organism has the ability to do all the biological functions and it is a model to the cell ability as a unit of structure and function of a living organism body.



*Yeast fungus*

### Activity (4): Yeast fungus Examination

■ **Materials:** A prepared slide of yeast fungus, Microscope.

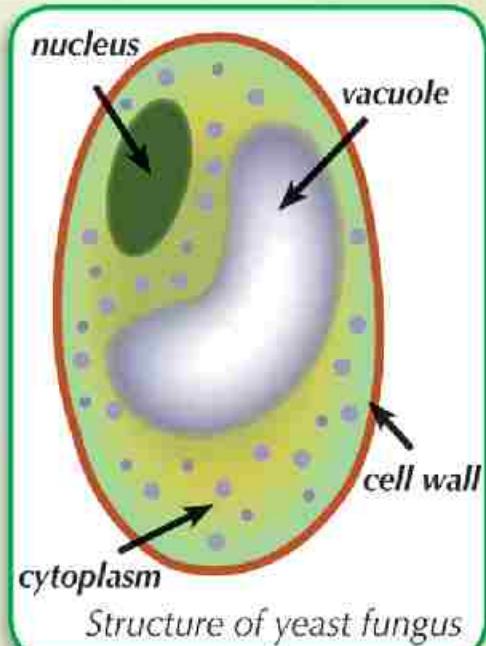
■ Use the compound microscope to examine the prepared slide of yeast fungus then describe what you see .....



#### Read and Learn

Some unicellular organisms are harmful such as bacteria that causing a lot of diseases, and others are useful such as the bacteria used in making yoghurt and some types of cheese ,as well as the yeast fungus used in making bread.

**Structure of yeast fungus:** It is an unicellular living organism that made up of nucleus, cytoplasm and a Cell wall that determines the cell's shape. The fungus has a great economic value.



### Economic importance of the yeast fungus

Yeast fungus is used in a lot of industries such as:

- 1- Making bread
- 2- Making alcohol



### Optional Activities

Choose an activity of the following and carry it out.

- 1- Collect photos to different shapes of plant and animal cells, then write a short brief beside each photo expressing the place and the function of the cells.
- 2- Unicellular organisms have several uses. Write a short brief expressing their most useful life applications.



## Summary

Cell is the unit of structure in a living organism.



Yeast fungus is an unicellular living organism which is used in a lot of industries such as :

- A. Making bread    B .Making alcohol

  - The animal cell is consist of nucleus , cytoplasm and plasma membrane .
  - The plant cell is consist of nucleus , cytoplasm , plasma membrane, sap vacuole , chloroplast and cell wall .

## Exercises and Activities

**Question 1: Choose the correct answer:**

**Question 2:** Relate the following organs to the human body different systems ( stomach- trachea )

**Question 3:** Compare the structure of the plant cell, animal cell and yeast fungus in the opposite table.

**Question 4:** Give an example to each of the following:

- A- A unicellular living organism.
- B- An organ related to the digestive system in the human body.
- C- A tissue in a plant.
- D- A system carries out the transport function in the human being.

**Question 5:** Have a bottle containing a diluted solution of cane honey and add a piece of yeast to it , then place a balloon on the glass mouth. Let it in a warm place for few hours ..... Record your observations.



### Self reflection and Self evaluation

My dear student, you can fill in the following card.

**A-** What are the items you like in this lesson?

.....

**B-** What are the items you dislike in this lesson?

.....

**C-** What are the activities you did and helped you to understand the lesson?

.....

**D-** What is the activity you found it difficult to carry it out?

.....

**E-** What is the importance of your overlapping with your classmates during the performance activities?

# The importance of sunlight to living organisms

## Lesson Objectives

**By the end of this lesson, a student will be able to:**

1. Identify the importance of sunlight as an energy resource for plants.
2. Conclude what photosynthesis is.
3. Show experimentally the effect of sunlight absence on the green plants.
4. Do experiment to know the photosynthesis products.
5. Identify what a producer living thing is.
6. Give examples of the producers.
7. Give examples of the consumers.
8. Identify the bacteria and fungi which feed on the organic wastes.
9. Show the importance of decomposers in nature.
10. Compare the producers, consumers and decomposers.
11. Explain the importance of conservation the green plants and trees in their environment.



### Lesson Items

- Sun is the energy resource for plants.
- Producers, consumers and decomposers.



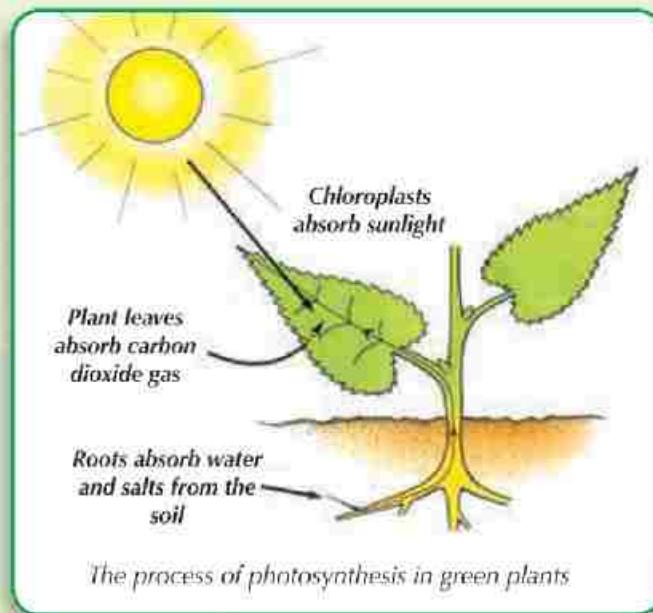
### Life Issues

- Pollution control.

A lot of animals depend mainly on plants to get their food. Plants supply animals with the required energy for survival. For example, we see cows and sheep feed on the plants, and birds feed on the seeds of some plants. How do plants manufacture their own food?



## Plants manufacture their own food



Plant cells contain chloroplasts which give the plants the green colour and absorb sunlight as well.

Plants absorb the light energy of the sun, water and salts from the soil, and carbon dioxide from the air in order to form their food. This process is known as photosynthesis.

**Photosynthesis Process:** A biological process takes place in the plant green parts to make a food of sugars and starches in the existence of sunlight, water, carbon dioxide and some mineral salts and oxygen is released .

### Activity (1): Importance of sunlight for green plants

Have two flowerpots, each one contains a green plant. Cover one of them by a constructed paper sack with narrow holes to let air goes through.

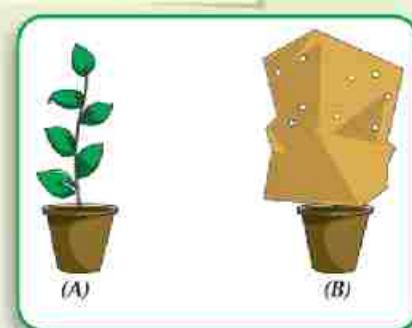
Leave the two flowerpots for two days and keep watering them regularly.

What happened to both pots after two days?

Record your observations.....

Conclusion .....

The covered plant becomes yellowish and weak, this is related to the absence of sunlight and the plant stopped manufacturing its food.



**Sunlight (light energy) is necessary for plants to make their own food. Sunlight is considered as the resource of energy for plants.**

### Products of photosynthesis process:

- 1- The plants make their food (sugar - starch ) and you can check its existence by using iodine solution where the color of strach chance into blue.
- 2 - Oxygen is released.

**Search for the Products of photosynthesis process through Egyption Knowledge Bank, and discuss your teacher and your classmates for how to check it out.**

**Producers (Amyothrophic):** are the living organisms that can make their own food by themselves through the process of photosynthesis

### Examples of producers:

- Green plants - algae - types of bacteria

### Exercise

Plants are known as amyotrophic living organisms- Explain this sentence.

.....  
.....



### Read and Learn

Green plants use carbon dioxide in the process of photosynthesis and release oxygen whereas they take oxygen in and release carbon dioxide out in the process of respiration

## **Consumers :**

Consumers are the living organisms depending on producers to get their own food directly or indirectly.



### **Examples of consumers:**

- Cows, sheep and chicken .... animals feed on producers (green plants).
- Lion, snake, hawk ..... animals feed on consumers that previously fed on producers.



## **Decomposers :**

### **Activity (2): Decomposing Fungi**

- Put some pieces of bread wet with water in a plastic sack and block the sack well and leave it for a few days.
- What do you observe? .....
- Let an orange , tomato or yoghurt out of refrigerator for few days

What do you observe? .....

Conclusion .....



#### **Attention**

Don't touch the decayed food with your hand, put on gloves before you touch it.

#### **Attention**

When you buy a reserved food, be sure of the validity date stated on the cover.

The rot formed on the bread and the orange is a living organism called fungi which known as the decomposers.

## Decomposers

Are living organisms can't make their own food by themselves since chloroplasts are not existed in their cells. Decomposers get their food through decomposing the organic wastes such as dead bodies, plant remains and decayed food.

### Examples of decomposers:

- 1- Some types of bacteria.
- 2- Some fungi such as bread mould fungus.

### Importance of decomposers:

- 1- Get rid of the organisms dead bodies and the plant remains.
- 2- Increase the soil fertility.
- 3- Used in a lot of industries.



### Read and Learn

A lot of industries depend mainly on decomposers such as production of organic fertilizers, biogas and tanning leathers and others.

### Exercise

Classify the following living organisms according to the way of their feeding



Tiger



Bread mold fungus



Wild cat



Green plant



## Optional Activities

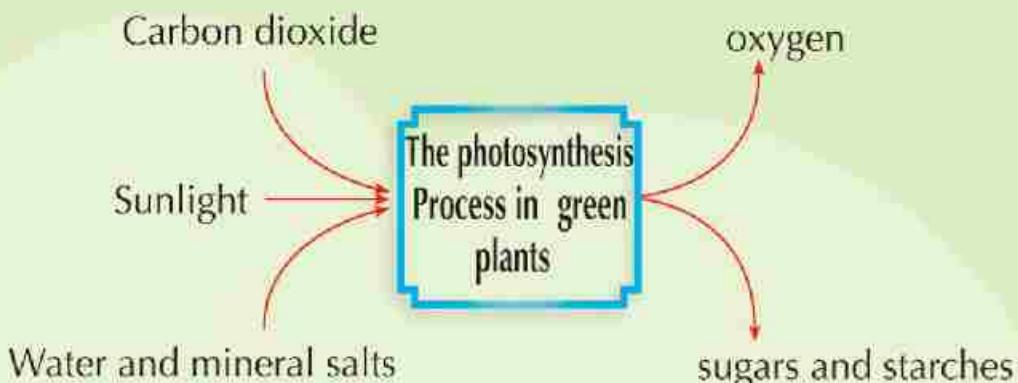
**Choose an activity of the following and carry it out .**



- Write a short brief on the role of some bacteria and fungi in nature by using Egyptian Knowledge Bank.
- Collect photos to producers , consumers and decomposers.



## Summary



### Types of living organisms according to their feeding

#### Producers

- Green plants
- Algae

#### Consumers

- Animals
- Human

#### Decomposers

- Some fungi
- Some bacteria

## Exercises and Activities

**Question 1: Choose the correct answer**



**Question 2: Complete the following sentences.**

- 1- The green plants produce ..... gas during the process of photosynthesis.
  - 2- To check the existence of starch in the plant leaf by using .....
  - 3- the process of photosynthesis needs the presence of ....., ....., .....

**Question 3:** Classify the following living organisms into producers, consumers and decomposers:

dog - lion - corn plant - green alga- yeast fungus - human-  
yoghurt bacteria

**Question 4: Give reasons**

- 1- Decomposers have a great economical and environmental importance.
- 2- There are chloroplasts in the cells of the producers.

**Question 5: Compare between producers, consumers and decomposers, then give an example for each type.**

---



**Self reflection and Self evaluation**

After you have learnt the sunlight and living organisms, try to fill in the following card.

**A-** What are the items you got like in this lesson?

.....

**B-** What are the items you dislike in this lesson?

.....

**C-** What is the activity that attracts your attention and got pleased with it?

.....

**D-** State the difficulties you faced when performing the activities of this lesson and how you overcome them.

.....

## General Exercises on Unit (1)

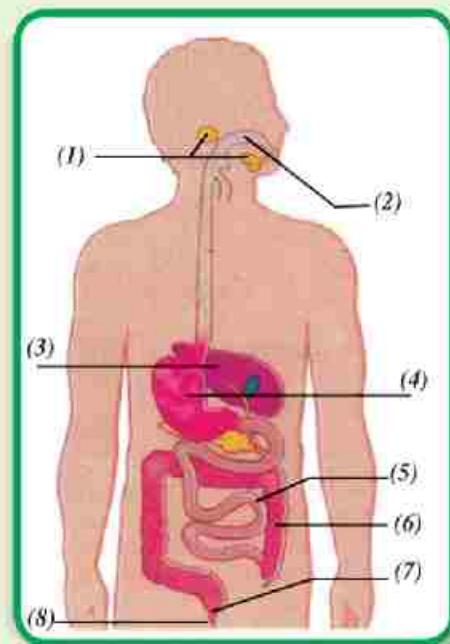
**Question 1: Complete the following sentences :**

- 1- During the process of photosynthesis ..... gas is evolved while ..... gas is released as a product of a respiration process.
  - 2- The living organism body is made up of systems integrated with each other, and every system is made up of ..... containing ..... each of them has its own function.
  - 3- Proteins are digested in ..... and .....
  - 4- The living organisms which are responsible for decomposing remains of living organisms are known as .....
  - 5- One example of digestive juices in the human body ..... and .....
  - 6- One example of the unicellular living organisms is .....
  - 7- In green plants, ..... energy is changed into ..... energy stored in a form of food .

**Question 2: Choose the correct answer:**

**Question 3:** Answer the following questions depending on the following figure.

- 1- At which part saliva is secreted?
  - 2- What is the relation between the organ number (3) and digesting fats?
  - 3- State the number of the organ which absorbs the digested food and write its name.



**Question 4:** The opposite experiment represents the process of respiration. Explain the respiration mechanism through your performance to this experiment.



**Question 5: Compare between the plant cell to the animal cell regarding:**

- 1- Chloroplasts
- 2- Cell wall

**Question 6:** State the Name of juices secreted by the following glands (salivary glands – liver)

**Question 7: Write the scientific term for each of the following sentences.**

- 1- The building unit in a living organism.
- 2- A liquid secreted in the mouth and helps in starches digestion.
- 3- A juice is secreted from the liver and affects fats digestion.
- 4- Small organelles spread in the cytoplasm of the plant cells and make photosynthesis process.
- 5- The living organisms that can make their own food by themselves through the process of photosynthesis.

**Question 8: What happens in each of the following cases:**

- 1- The absence of chloroplasts from the corn plant cells.
- 2- The absence of decomposers from nature.
- 3- Removing the small intestine from a human body.
- 4- Removing the epiglottis from a human body.
- 5- There were no any mucous or hair in the nose.

**Unit  
Two**

# **Energy and its Forms**

## **Unit Lessons**

**1- Forms of Energy and their  
Changes**

**2- The Electricity.**

**Energy around us in all times and places**

## Objectives

**By the end of this unit, a Student will be able to:**

1. Explain the meaning of energy.
2. Perform out simple experiments about energy, sound and electricity.
3. Give examples to show home Equipments that depend on energy in their work.
4. Share his (her) classmates in designing activities and games showing energy.
5. Describe some phenomena related with electricity.
6. Recognize the contribution of scientists in field of energy.
7. Discuse his (her) classmates about the effect of energy in his (her) environment.

## 1 LESSON One

# Forms of Energy and their changes

### Lesson Objectives

By the end of the lesson, a student will be able to:

1. Infer the concept of energy.
2. Mention examples of different forms of energy.
3. Design simple experiments showing the origin of sound.
4. Mention examples for changes of energy.
5. Identify the ways of energy changes from one form to another.
6. Determine the changes of energy in some equipments.
7. Infer the changes of energy in his environment.
8. Explain to his classmates the importance of changes of energy for man and environment.



#### Lesson Items

- Energy .
- Forms of energy
- Changes of energy



#### Life Issues

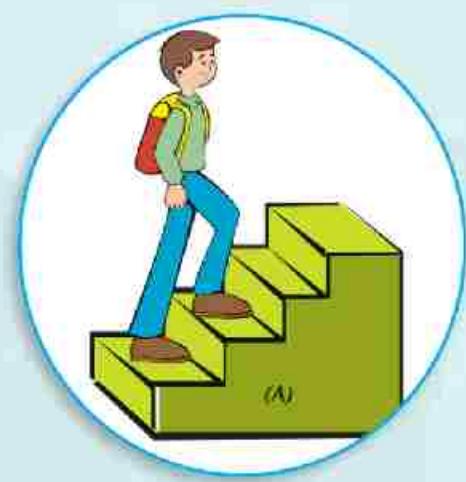
- Rationalizing of energy consumption.

You obtain energy from food that enables you to move, also the car needs fuel as a source of energy that causes its motion and the electric lamp needs an electric energy to light. There are other forms of energy that can be changed from one form to another.



## Energy :

### Activity (1): Energy meaning



- Look at the pictures in front of you.
- What do the pupil do in picture (A) and the pupil in picture (B)?
- What does the pupil exert to enable to ascending the ladder and riding the bicycle?

Conclusion: .....

- The pupil in picture (A) exerts a work in ascending the ladder and the pupil in picture (B) exerts a work in riding the bicycle.

**Energy:** It is the ability to do work.

### Forms of energy :

There are a lot of equipments in your home which supply us with different forms of energy. Lets us to identify the forms of energy.

### Activity (2): The equipments and forms of energy

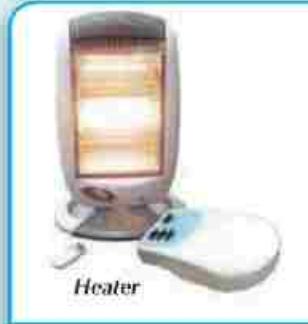
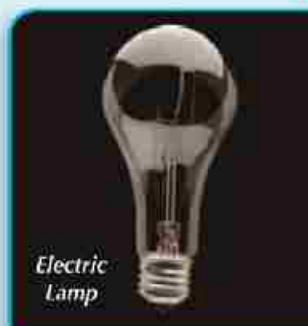
Look at the following equipments and determine the kind of energy that we get it from each equipment.



### Read and Learn

If you was sitting on a chair to watch television or to read a book, do you believe that you exert work or not?

In this case you don't exert a work because you don't move. If you carried a bag in your hand and wait in your place at rest for 30 minutes. During this you don't exert work except during rising the bag.



- Does the spring of a toy car store energy?  
Yes ( ) No ( ) and what kind of it? .....
- The electric lamp gives ..... energy.

- The electric fan gives..... energy
  - The electric heater gives..... energy
  - The Piano gives ..... energy
  - The dry cell gives..... energy
- Conclusion: .....

### The are several forms of energy:

- 1- Potential energy: Like the energy stored in a spring of a toy car.
- 2- Light energy: Like the energy produced from the electric lamp.
- 3- Kinetic energy: like the energy produced from the electric fan.
- 4- Heat energy: Like the energy produced from the heater.
- 5- Sound energy: like the energy produced from the Piano.
- 6- Electric energy: Like the energy produced from the dry cell.

All these equipments have ability to do work.

### Sound energy:

Perform the following activity to show sound energy meaning:

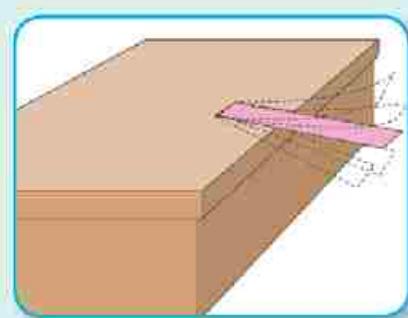
#### Activity (3) :

##### ■ Materials:

A wooden ruler - a table .

##### ■ Procedures:

- Fix one end of the wooden ruler on the table.
- Pull the other end downwards then leave it.



What do you hear?.....

Vibration of the ruler produces sound.

Conclusion: .....

**Sound is a form of energy, That reaches ear causing hearing.**



### Read and Learn

Sound is produced from vibration of objects.

Touch your larynx by the tips of your fingers while you are speaking.

Is the larynx vibrate? The larynx moves and the vibrations inside the larynx causes the occurrence of sound, and when you put your hand on a speaker produces sound you found it vibrates. So that, sound is produced due to vibration of objects.

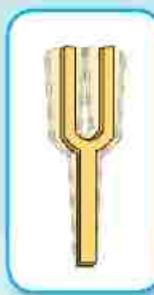
### Activity (4): Sound and vibration of objects

#### ■ Materials:

A tuning fork.

#### ■ Procedures:

- Catch the handle of the tuning fork and tap it on a wooden table.
- Close the two prongs of the tuning fork to one of your ears quickly.



Have you hear a sound? .....

- Touch one of the prongs of the fork by your finger after tapping it.

What do you feel? .....

Conclusion: .....

You hear a sound when you tap the tuning fork and feel by vibration of its prongs when you touch it.

**Sound is produced due to vibration of objects.**

### Changes of energy:

There are a lot of equipments that change the energy from one form to another.

### 1- Changing of potential energy into kinetic energy

Carry out the following activity to prove the change of potential energy into kinetic energy:

## Changing of potential energy into kinetic energy :

- Bring a toy car that works by spring.
- Fill the spring then put the car on a table.

What do you observe? .....

Conclusion: .....

On rotating the spring, work is exerted and kept in it as potential energy and on leaving it potential energy changes into kinetic energy that causes the motion of the car.

**Potential energy changes into kinetic energy in spring of children toys.**



### Read and Learn

There is an electric generator in the car to feed the battery by electric energy. The battery gives this energy to motor which change the electric energy into kinetic energy that rotates the motor to push the car, then it moves.

## 2- Changes of kinetic energy:

### Activity (6): Changing of kinetic energy into sound energy :

#### ■ Materials:

A rubber band - two nails -a piece of wood (its length 30 cm)- a small hammer.

#### ■ Procedures:

- Fix the two nails in the piece of wood at a distance of 25 cm by the hammer as figure (A).
- Tie the two ends of the rubber band in the two nails as figure (B).
- Pull the rubber band then leave it.

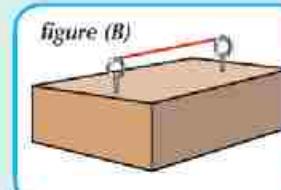
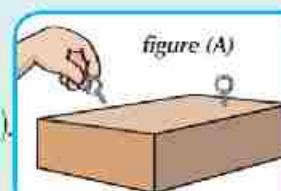
What do you hear ? .....

Conclusion: .....

**Kinetic energy of rubber band is changed into sound energy that you hear it.**

#### Attention!

Take care on using the hammer



### **Activity (7): Changing of kinetic energy into heat energy:**

Rub your hands together.

What do you feel? .....

Conclusion: .....

**Kinetic energy of your hands is changed into heat energy.**



### **Activity (8): Changing of kinetic energy into electric energy**

On increasing the speed of the bicycle, you notice the increase in lamp lighting of the bicycle.

- Have you know why? .....

There is a small equipment touches the tire called "Dynamo" that changes kinetic energy of the tire into electric energy that causes the lighting of the lamp.



Conclusion: .....

**In Dynamo, kinetic energy changes into electric energy.**

### **3- Changes of electric energy:**

#### **Changing of electric energy into light energy:**

On passing of an electric current in a lamp, it lights up.

**In electric lamp, electric energy changes into light energy.**



### **Activity (9): Changing of electric energy into kinetic energy**

Switch on the electric fan in your school laboratory or in your home.

What do you observe? .....

Conclusion: .....

Passing of an electric current in the motor of fan causes its rotation.



**In the motor of fan, electric energy changes into kinetic energy.**

### **4- Changes of light energy:**

#### **Activity (10): Changing of light energy into heat energy**

■ **Materials:** a convergent lens - a paper.

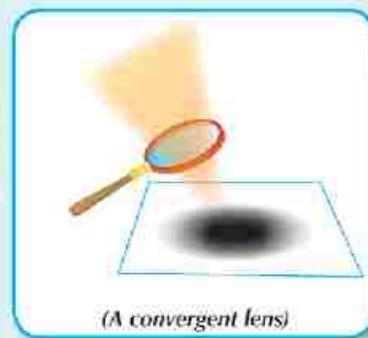
■ **Procedures:**

Put the lens over the paper.

- Expose the lens to sun rays for a period of time.

What do you observe? .....

Conclusion: .....

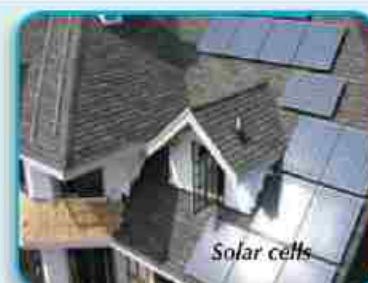


(A convergent lens)

**Light energy of the sun changes into heat energy by the magnifying lens( convergent lens) .**

### **Changing of light energy into electric energy:**

Solar cells are used in getting electric energy from light energy, and the benefit of this is providing artificial satellites by electric energy for operating their equipments and generating electric energy that is used in homes.



Solar cells

**In solar cells, light energy changes into electric energy.**



## Optional Activities

Choose one of the following activities then perform it.

**(1) Design a fan:** Use the following tools in making an electric fan.

■ **Materials:** a motor of a toy - a paper fan - a battery - a sticking tape - two pieces of connection wires.

**(2) Design a string tool:**

■ Use these tools: Thin plastic threads - nails - a hammer - a plate of wood (30 cm)



## Summary

- **Energy:** It is the ability to do work.
- **Sound:** It is a form of energy that reaches to ear causing the hearing and it originates from the vibration of objects.
- **Changes of energy:**

Equipment	Used energy	Produced energy	Equipment	Used energy	Produced energy
Fan	Electric	Kinetic	Motor	Electric	Kinetic
Lamp	Electric	Light	Violin	Kinetic	Sound
Heater	Electric	Heat	Solar cell	Light	Electric
Radio	Electric	Sound	Solar heater	Light	Heat
Dynamo	Kinetic	Electric	Battery	Chemical	Electric

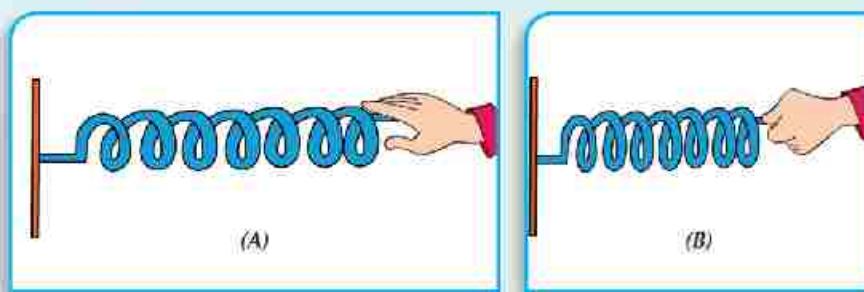
## Exercises and Activities

**Question (1): Complete the following statements:**

- 1- Energy is the ability to do.....
- 2- From the forms of energy ....., ....., .....
- 3- In electric lamp, electric energy changes into ..... energy.
- 4- Sound originates due to .....
- 5- In the motor of a car, electric energy changes into ..... energy.
- 6- Light energy changes into electric energy in .....

**Question (2):** On removing a nail from a wooden plate, the nail becomes warm. Explain why?

**Question (3):**



- Spring (A) and Spring (B) are similar, then spring (A) is pressed a little and fixed in its place, and the spring (B) is pressed by a larger degree and fixed in its place.
- What is the name of the energy stored in each spring?
- What is the spring that store a larger amount of energy?

**Question (4): What happens when.....?**

- 1- Sun rays fall on a convergent lens that put over a paper?
- 2- A piece of rubber is pulled and fixed from its ends then leaving it?
- 3- Rub your hands together.
- 4- Tap tuning fork on a wooden table.
- 5- Exposing a solar cell to the sun.

**Question (5): Mention the changes of energy in the following**

**cases:**

- 1- On going to school by a bicycle ..
- 2- Lighting of an electric lamp in your classroom.
- 3- Operating the electric fan when you return to home.



## Self reflection and Self evaluation

Dear student , after you've finished the energy and its forms lesson.

(A) What are the parts that you like in the lesson?

.....

(B) What are the parts that you don't like in the lesson?

.....

(C) what are the important information that you get about energy and its forms?

.....

(D) Mention some equipments in your home that change energy from one form to another.

.....

## 2 LESSON Two

# The Electricity

### Lesson Objectives

**By the end of the lesson, a student will be able to:**

1. Explain the concept of static electricity and current electricity.
2. Infer the phenomena related to static electricity.
3. Design activities for generation of static electricity.
4. Explain the attraction of small bits of paper to a charged ruler.
5. Compare between static electricity and current electricity.
6. Show the importance of electricity in life and its using in environment.

#### Lesson Items

- Static electricity
- Current electricity
- Domestic electric equipments.

#### Life Issues

- Rationalizing the consumption of electricity.

Most of equipments at home work by electricity such as television, computer and refrigerator. These equipments need wires to connect them by electricity and this type of electricity is called «current electricity».



There is another kind of electricity does not flow in wires and is called «static electricity»

**Here are some phenomena related to static electricity such as:**

- The vision of light in the sky that is called "lightning".
- Standing of your hair when you combing it by a plastic comb.
- Hearing a sound when you putting off your clothes in some days or vision of a flash.

What is the reason of occurrence of those phenomena in your opinion? .....



- Formation of electric charges is the reason of these phenomena and these charges are called static electricity.

**Static electricity:** It is formed from electric charges that remain on an object.



## Static electricity generation

### Activity (1): Balloon and generation of electricity

- **Materials:** a balloon - a piece of wool -a little amount of powdered sugar - a thread.

■ **Procedures:**

- Blow a balloon and tie its opening by a thread.
- Rub the balloon by the piece of wool.
- Close the balloon to sugar.

What do you observe? .....



What is your explanation for that?  
.....

Conclusion: .....

■ **Explanation:**

On rubbing a balloon by a piece of wool, electric charges are formed on its surface and attract sugar to them.

**Activity (2): Small bits of paper and the charged ruler**

■ **Materials:** a plastic ruler - small bits of paper

■ **Procedures:**

- Close the ruler to the small bits of paper

Are the bits of paper move or not? .....

- Rub the ruler by you hair several times.

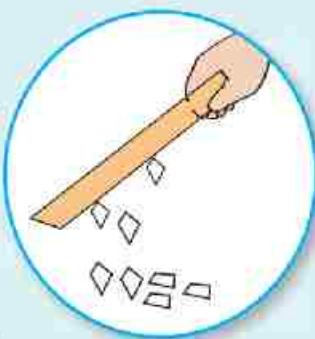
- Close the ruler to the small bits of paper.

What do you observe? .....

**Read and Learn**

**Light of lightning:**

Lightning happens when negative electric charges found in clouds meet with positive electric charges rising from earth.



Explanation: .....

Before rubbing the ruler, there is no electric charges on the ruler, while after the rubbing electric charges are formed on ruler that attracted the small bits of paper to them.

**Rubbing of objects generates static electricity.**

## Current electricity (Dynamic)

Perform the following activity to know the concept of current electricity:

### Activity (3): Electric current

■ **Materials:** a pocket torch - a battery for the torch.

■ **Procedures:** Put the battery inside the torch then press on its key, what happens to its lamp? .....

Explanation: .....

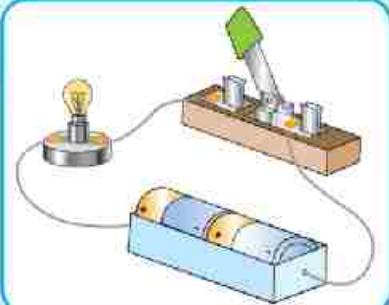
The battery pushes electric charges in wires(name as a good conductors of electricity) that reaches to the lamp causing its lighting and an electric current flows in one direction, so that it is called a direct current.

**Current electricity:** They are electric charges that flow through connecting wires for long distances.



### **Activity (4): Formation of an electric circuit**

■ **Material:** a battery - a lamp with a base - connecting wires have uncovered ends - electric switch.



#### **Procedures:**

- Set up an electric circuit as shown in the opposite figure.

Perform the following steps in the table and record your observations about the state of lamp in each step.

#### **Attention**

Don't use the electricity of homes in performance of this activity or any other activities.

Steps of performance	State of lamp	
	Light	Do not light
1- On closing the circuit by the switch . 2- On opening the circuit by the switch. 3- On removing the battery then closing the circuit. 4- On connecting the battery and closing the circuit.		

In light of your observations, answer the following questions:

What is the function of battery? .....

What is the benefit of switch? .....

What is the importance of connecting wires? .....

- **The battery:** It is the source of electric current.
- **The switch:** It is used to close and open the electric circuit.
- **The wires:** They are used to transfer electric current from battery to lamp.
- **The electric circuit:** It is the path of electric current.

## Exercise

Compare between static electricity and current electricity.



Egyptian Knowledge Bank  
المعرفة المصرية

Searching by using Egyptian knowledge Bank about some inventors of electric equipment:

**Marconi:** The inventor of radio, he was born in Bolivia in 1874.

**Jon Bird:** The inventor of television, he was born in Britain in 1888 - 1946.

**Volta:** The first inventor of generating electric current in 1800.



## Summary

- **Static electricity:** It is the electric charges that remain on an object.
  - **The charged ruler:** It attracts uncharged small bits of paper.
- **Current electricity:** It is the electric charges that flow through connecting wires.
  - **The electric current:** It is movable electric charges.
  - **The electric circuit:** It is the path of electric current.
  - Most of equipments at home work by electricity.

## **Exercises and Activities**

**Question (1): what happens when....?**

- 1-** Rubbing your hair by a plastic comb.
- 2-** Rubbing a plastic ruler by a piece of wool.
- 3-** Rubbing a flattened balloon by a piece of wool then closing it to your hair.
- 4-** Removing the battery from a closed electric circuit.

**Question (2): What is the result of ....?**

- 1-** Closing a charged balloon to a wall.
- 2-** The absence of a switch in an electric circuit.

**Question (3): What is meant by ....?**

- 1-** Static electricity.
- 2-** Dynamic electricity (current).
- 3-** Electric circuit.

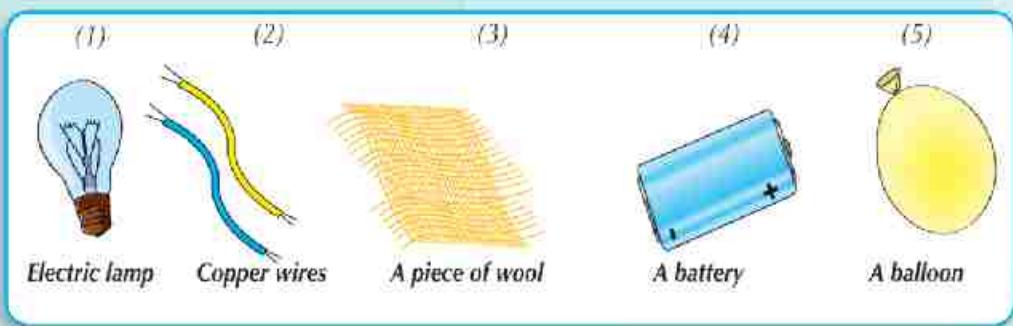
**Question (4):** Compare between the static electricity and current electricity.

**Question (5): Give reasons:**

- 1- Attracting the small bits of paper to a ruler that was rubbed by your hair.
- 2- Attracting a balloon rubbed by the wool to a wall.
- 3- It is forbidden to use electric current at home for performing an activity.

**Question (6):** Suggest a way to decrease the consumption of electricity.

**Question (7): Examine the following shapes:**



- Which of them can be used together to make an electric circuit .....?  
(a) 1, 3, 4      (b) 1, 2, 4      (c) 1, 2, 3      (d) 1, 4, 5
- Which of them can be used together in generating static electricity .....?  
(a) 2, 1      (b) 3, 2      (c) 3, 4      (d) 3, 5



## Self reflection and Self evaluation

After you've finished the studying electricity lesson fill the following card.

**(A)** what are the parts that you like in the lesson?

.....

**(B)** what are the parts that you dislike in the lesson?

.....

**(C)** what is the benefit of electricity in your life?

.....

**(D)** what are you doing to rationalize the consumption of electricity at your home?

.....

## General Exercises on Unit (2)

Question (1): Put (✓) or (✗) in front of the following sentences:

- (a) Sound stops when the vibration of tuning fork stops. ( )
- (b) On filling the spring of a toy car, kinetic energy changes into potential energy. ( )
- (c) Small bits of paper are attracted to a rubbed plastic ruler. ( )

Question (2): What is the name of produced energy when...?

- (a) Rubbing your hands together.
- (b) Knocking on the door of classroom.
- (c) Running of a pupil.
- (d) Pulling of a string .
- (e) Ringing of a school bell.
- (f) Lighting of an electric lamp.

**Question (3): Complete the following sentences:**

- 1- Sound originates from .....
- 2- Energy is the ability to do .....
- 3- We get ..... energy from the solar cells.

**Question (4): Give reasons:**

- 1- Attraction small bits of paper to a rubbed ruler by your hair.
- 2- You hear sound when you tap a tuning fork.
- 3- When you ride a bicycle, some changes of energy happen.

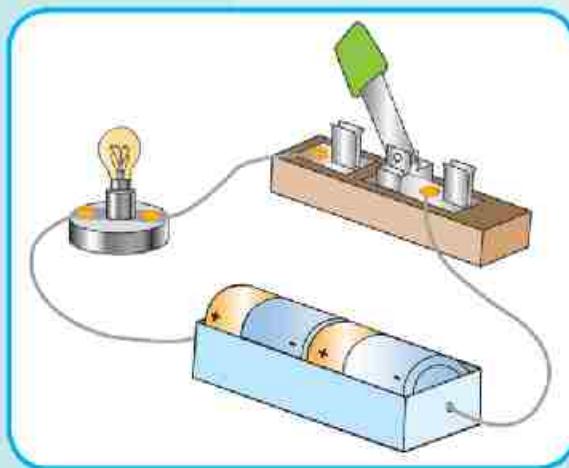
**Question (5): What is meant by.....?**

- 1- Static electricity.
- 2- Current electricity.
- 3- Sound.

**Question (6 ): What happens when ....?**

- 1- Cutting off electric current from your home for one day.
- 2- Closing a ruler rubbed by a piece of wool to small bits of paper.
- 3- Pulling the free end of a vertically hanged spring then leaving it free.

Question (7): The following figure represents an electric circuit :



Determine its components and function of each of them.

QR	Video title	Unit	
	Digestive system	One : Living organisms	1
	Respiratory system		2
	Cell		3
	Photosynthesis process		4
	Energy forms and transformation	Two : The enegy and its forms	5
	Electricity: Electrical circuits		6

**المواصفات الفنية:**

مقاس الكتاب:	١/٨ (٨٢×٥٧) سم
طبع المتن:	اللون
طبع الفلافل:	اللون
ورق المتن:	ورق أبيض ٧٠ جم
ورق الفلافل:	ورق كوشيه مستورد ٢٠٠ جم
عدد الصفحات:	٧٦ صفحة + ٤ لفلافل

**رقم الإيداع: ٢٠٢٠/١٩٨٤٣**

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