

# Notes For Parents

## On Concept [1.1]

Lessons	Activities	What you should do with your child
<b>1</b>	<b>Activity 1</b>	Discuss with your child what he/she already know about cells.
	<b>Activity 2</b>	Let your child observe the images that show animal cells and plant cells.
	<b>Activity 3</b>	Explain to your child some characteristics of the animal cell and plant cell.
	<b>Activity 4</b>	Discuss with your child the cell needs.
<b>2</b>	<b>Activity 5</b>	Explain to your child some of the early work associated with the discovery of cells.
	<b>Activity 6</b>	Discuss with your child the structure of a microscope and how to use it to examine a slide of plant cells or animal cells.
<b>3</b>	<b>Activity 7</b>	Help your child to know some main parts in the animal cell and plant cell.
	<b>Activity 8</b>	Explain to your child the functions of some common parts in the animal cell and plant cell.
<b>4</b>	<b>Activity 9</b>	Let your child compare between the animal cell and the plant cell.
	<b>Activity 10</b>	Help your child to plan a model of a cell city.
<b>5</b>	<b>Activity 11</b>	Let your child build a model of plant cell city and another model of animal cell city and compare between them.
<b>6</b>	<b>Activity 12</b>	Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation.
	<b>Activity 13</b>	Discuss with your child the work and tools of cell biologists.

# LESSON ONE

## Activity 1 Can You Explain ?



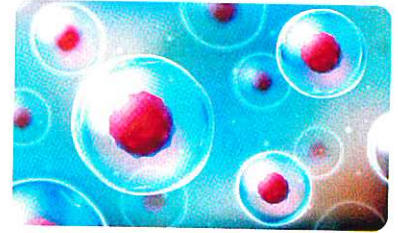
- In the previous picture, we notice that the brick is the building unit of a wall or a building.
- In this activity, we will study that the cell is the building unit of the living organism's body.

### ► What is the cell ?

- Living organisms' bodies are built up of tiny structures called "cells".

#### The cell :

It is the main building unit of the living organism's body that carries out all its own vital activities.



Cells

- Cells are found only in the bodies of living organisms which include humans, animals, plants and also micro-organisms that we cannot see with our naked eye (unaided eye) such as bacteria.
- Cells are not found in non-living things.
- Cells carry out all vital activities that living organisms need to survive such as growth, reproduction, repairing the damaged cells, .... etc.
- Cells are tiny particles that cannot be seen by naked eye but we need a special device called "microscope" to see cells and their structures.



Microscope

### ► In this concept, we will study :

- Cell needs.
- Using microscope to view cells.
- The structure of the plant cell and animal cell.
- Functions of cell components.

brick  
micro-organisms  
vital activities

طوب  
كائنات دقيقة  
أنشطة حيوية

reproduction  
tiny  
cell

التكاثر  
صغير جدًا  
خلية

bacteria  
naked eye / unaided eye  
damaged cells

البكتريا  
العين المجردة  
الخلايا التالفة

## Activity 2 Building Blocks of Living Organisms

### ► Put (✓) or (x) :

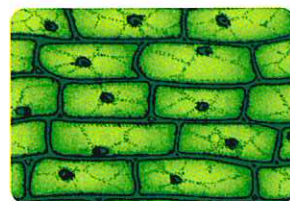
1. Microscopes are used to see the structure of cells. ( )
2. Living organisms and non-living things are made up of cells. ( )

### ► Cells as building blocks :

- The cell is the main building unit of life, structure and function of all living organisms on Earth.
- Living organisms are different in **shape** and **structure** but all of them are similar in that they are made up of **one cell** or **more**.
- As you can see in the opposite figures that the animal cells differ from plant cells in **shape** and **structure**.



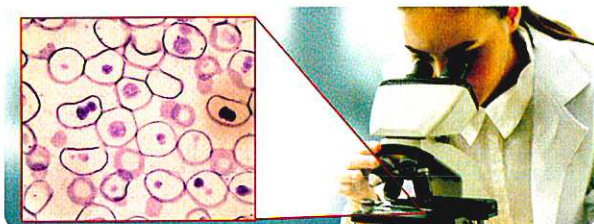
Animal cells



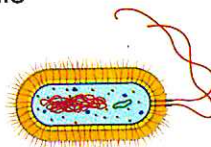
Plant cells

### ► Size of cells :

- The naked eye can see objects that are about 0.1 mm long but if the size of these objects is smaller than that, it is difficult to see them.
- The length of most of cells are tiny, where :
  - The length of common animal cells and plant cells ranges between **0.1 mm** and **0.005 mm**.
  - Bacteria is a living organism that its body consists of one cell only with length **less than 0.005 mm**.
  - **So**, we need a **microscope** to see these tiny cells.
- Some cells may be too large and you can see them with your naked eye without using a microscope such as a **bird's egg** that contains **only one big cell**.



Animal cells



Bacteria



Bird's eggs

### Check your understanding

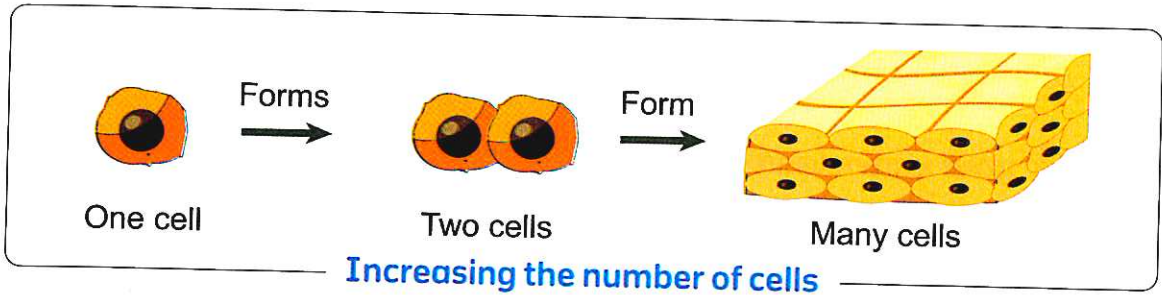
#### ► Put (✓) or (x) :

1. Most of living organisms' cells can be seen without using a microscope. ( )
2. The cell is the building unit of living organisms' bodies. ( )

## Activity 3 What Do You Already Know About the Cell as a System

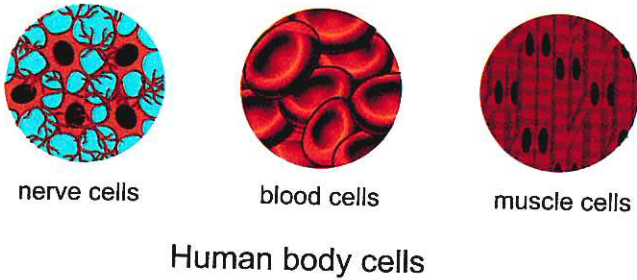
- Living organisms grow and reproduce as a result of **increasing the number of the cells** that make up their bodies. This means that new cells are formed as shown in the following figure :

**Note**  
During the growth of a living organism, the cells **don't increase in size**.

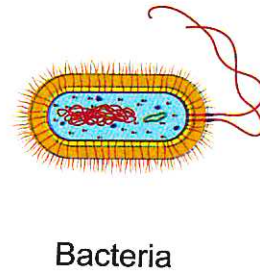


- The body of some living organisms are made up of :

- Many cells such as **human body**.

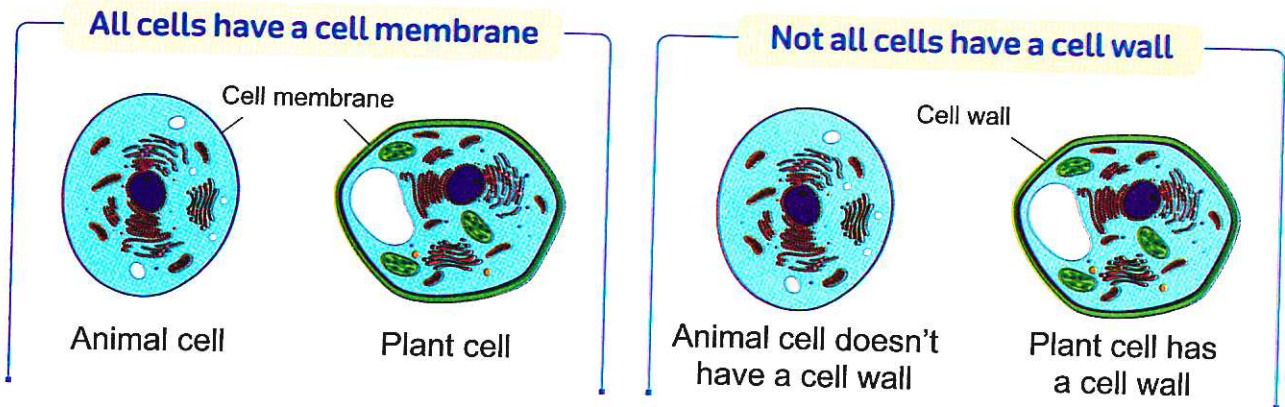


- One cell only such as **bacteria**.

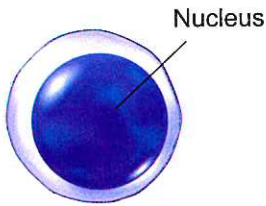


## Characteristics of cells :

Let's see some similarities and differences between cells.



Not all cells have a nucleus



Animal cell has a nucleus

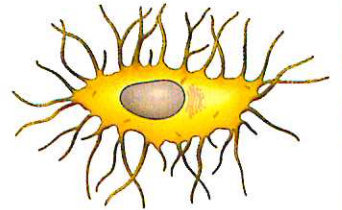


Animal cell doesn't have a nucleus

The cells of one living organism are not identical



Human muscle cell



Human bone cell



Check your understanding

► Put (✓) or (✗) :

1. Increasing the size of cells causes the growth of a living organism. ( )
2. All the cells of living organisms contain a cell wall. ( )

## Activity 4 Cell Needs

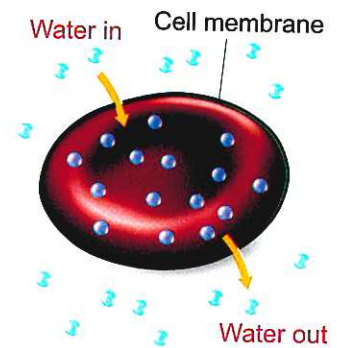
- In the previous activity, you have known that during the growth of a living organism, the new cells are formed from cells that already exist in its body.

### ► What are the needs of the cell ?

- The cell has needs that are completely similar to the needs of all living organisms.
- The cell needs **energy** to carry out all its own life activities to survive and get rid of waste materials.
- The cell needs some materials such as :
  - Food (nutrients) and oxygen to get energy.
  - Water to stay alive.

### ► How does the cell get its needs of water ?

- The **cell membrane** allows water to enter and exit the cell according to its needs.
- **So**, the cell keeps the water balance on both sides of the cell membrane (i.e. inside and outside the cell).



### ? What happens if ...?

There is much water enter the cell.

The cell will swell until it bursts.

### ✍ Check your understanding

#### ► Put (✓) or (x) :

1. Cells need nutrients and oxygen only to survive. ( )
2. Increasing the number of cells means the formation of new cells. ( )

#### ► Complete the following sentence :

The ..... allows water to enter and exit the cell according to its needs.

In the Assessment Book :

Try to answer :

Self-Assessment ①

needs  
exist  
enter

احتياجات burst  
يوجد survive  
يدخل exit

ينفجر swell  
يبقى حيًا water balance  
يخرج

ينتفخ  
توازن الماء

# Exercises on Lesson 1

● Understand

● Apply

● Higher Thinking Skills

## 1 Choose the correct answer :

- The smallest tiny structures that build up all living organism's bodies are .....  
a. systems.                      b. cells.                      c. organs.                      d. bricks.
- We can see the cell of ..... without using a microscope.  
a. bacteria                      b. plant                      c. human                      d. bird's egg
- The ..... is responsible for the entry and exit of water into and out of the cell.  
a. cell membrane                      b. muscle cell  
c. nucleus                      d. bone cell
- The number of cells which build up a baby's body is ..... the number of cells which build up his father's body.  
a. more than                      b. less than                      c. equal to                      d. double
- The structure(s) found in the plant cell and not found in the animal cell is/are .....  
a. cell membrane only.                      b. cell wall only.  
c. cell membrane and nucleus.                      d. cell wall and nucleus.
- The cell needs ..... to get its needed energy and to stay alive.  
a. oxygen only                      b. water only  
c. food and water only                      d. food, oxygen and water
- Growth of a living organism is resulted from increasing the ..... of cells in its body. (Sohag 2024)  
a. length                      b. size                      c. number                      d. mass
- The body of ..... is composed of one cell only. (Dakahlia 2024)  
a. human                      b. bacteria                      c. a big tree                      d. an elephant

## 2 Put (✓) or (X) :

- We can see the cells of all living organisms with the naked eye. ( )
- All living organisms are similar in that they are made up of one cell only. ( )
- The new cells are formed from other cells existed in the body of a living organism. ( )
- All animal cells have a nucleus. ( )
- The cells that are present in different living organisms are not similar. ( )
- Growth of living organisms depends on increasing the number of cells in living organism's body. ( )

- 7. The cell gets its energy from nutrients only. ( )
- 8. The cell membrane allow water to go inside and outside the cell. ( )
- 9. The cell is the building unit of both living organisms and non-living things. ( )
- 10. The cells that build up a fish body are similar to that of onion plant. ( )

### 3 Complete the following sentences using the words below :

(bird's egg – bacteria – cell membrane – cell wall – energy)

- 1. All cells of living organisms bodies have ..... but plant cells only have .....
- 2. The cell needs ..... to carry out its own life activities.
- 3. Some cells may be too large like .....
- 4. The length of some cells may be less than 0.005 mm like .....

### 4 Write the scientific term of each of the following :

- 1. The main building unit of living organisms bodies that can do all vital processes. (Giza 2024) (.....)
- 2. The component of cell that allows water to enter and exit the cell. (.....)
- 3. A device that is used to see the structure of living organisms cells. (.....)
- 4. Living organisms which contain cell wall in the structure of their cells. (.....)

### 5 Complete the following sentences :

- 1. Some cells may be large enough to be seen with our naked eye such as .....
- 2. The plant cell has ..... which is not found in animal cell.
- 3. Human body cells need food and oxygen to get ..... which is needed to do all vital processes.
- 4. Your body grows up due to the increase in number of your body .....
- 5. All cells allow water to go inside and outside them through the .....
- 6. To see the structure of bacteria, we need to use a .....

### 6 Give reasons for :

- 1. The cell needs energy.  
.....
- 2. The cell allows water to go outside it. (Giza 2024)  
.....
- 3. You cannot see the body of bacteria with your naked eye.  
.....



**7 What happens if ...?**

1. There is much water enter the cell.

.....

2. The cell doesn't get its needs of nutrients, oxygen and water.

.....

3. The number of cells increased in the body of a baby.

.....

**8 Look at the opposite figure, then answer the following questions :**

1. This device is called .....

2. If the examined cell has a cell wall,  
it may be a cell of .....

a. plant's leaf.

b. lion's body.

c. human body.

d. mouse body.

3. This device must be used to see the structure of all the following  
cells , except .....

a. plant cells.

b. human body cells.

c. bird's egg.

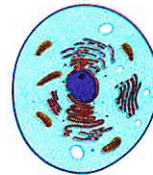
d. bacteria cells.



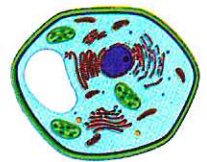
**9 Look at the opposite figures, that show the structure of different cells, then complete the sentences below :**

1. The cell wall is found  
in cell number ..... only.

2. By examining a part of your skin under  
microscope you can see the same  
structure of the cell number .....



Cell ①  
(Animal cell)



Cell ②  
(Plant cell)

# LESSON TWO

## Activity 5 Brief History of the Cell

### ► Put (✓) or (x) :

1. Scientists use microscopes to study cells. ( )
2. All cells can be seen by naked eye. ( )

### History of the cell :

- In 1665, **Robert Hooke** used his microscope to observe the tiny particles of some samples of plant parts that cannot be seen by naked eye, and he named each of these tiny particles "the cell".
- Robert Hooke was the first person who use the word "cell".



Robert Hooke

### Importance of microscopes :

- **The modern microscopes help scientists to make new discoveries, such as :**
  - The cell is the building unit of living organisms bodies.
  - All living organisms are made up of cells however these cells are large or small.
  - The body of some simple living organisms consists of one cell only.
  - The body of living organisms that contains complex systems consists of many different cells.
  - The different parts of the cell and their functions.
  - The nucleus that is found inside many cells.

### **Note**

Scientists can exchange information of their research between each other to better understand cells.

### **Check your understanding**

#### ► Complete the following sentences using the words below :

( Robert Hooke – exchange information – modern microscope )

1. Scientists can ..... of their research between each other.
2. The first scientist who discovered the cell was .....
3. Different parts of the cell and their functions can be observed using the .....

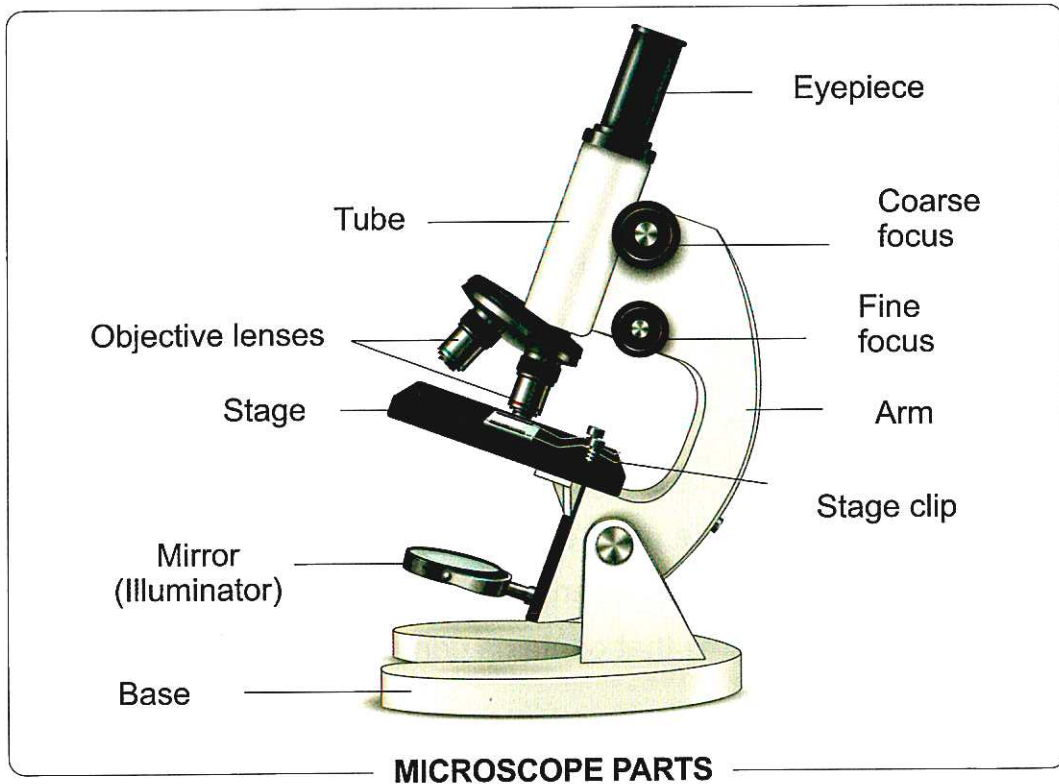
## Activity 6 Using a Microscope to View Cells

► In this activity, we are going to study :

- The structure of microscope.
- How to prepare a slide of plant cells.
- How to use the compound microscope.

### Structure of microscope :

► The microscope consists of many parts as shown in the figure below :

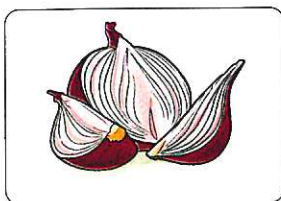


### Note

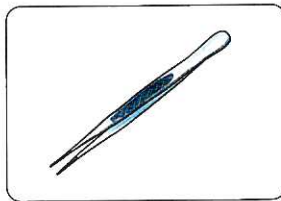
The objective lenses have different focusing power to form different degrees of magnified images to allow us see the components of cells.

### Preparing a slide of plant cells :

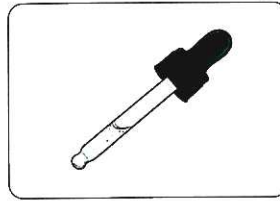
#### Tools



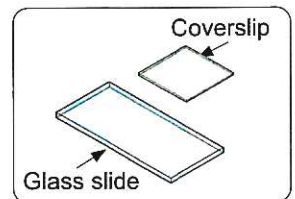
Onion



Forceps



Dropper



Glass slide and coverslip

prepare  
coarse focus  
fine focus

يعد/يجهز  
المقبض الضابط الكبير  
المقبض الضابط الدقيق

objective lenses  
base  
onion

عدسات شبيئية  
قاعدة  
بصل

dropper  
eyepiece  
stage

قطارة  
عدسة عينية  
منصة

magnify  
forceps  
coverslip

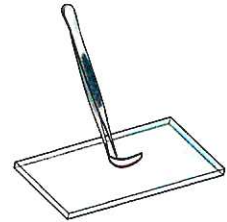
تكبير  
ملقط  
غطاء شريحة

**Steps**

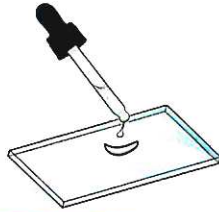
1. Use the forceps to separate the thin membrane of one of the onion pieces.



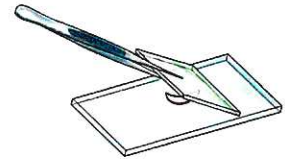
2. Put the thin membrane on the glass slide.



3. Add a drop of water on the thin membrane using the dropper.



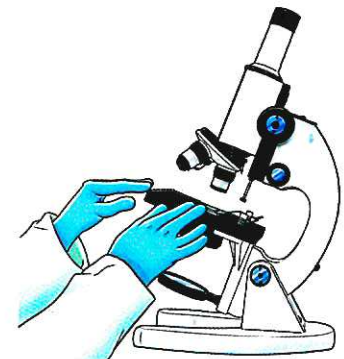
4. Cover the slide with the coverslip.



**Using the compound microscope to examine the slide :**

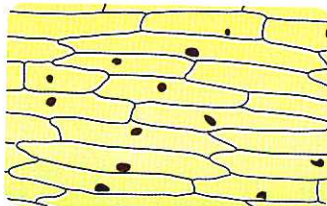
**Steps**

1. Put the slide on the stage and fix it with the stage clip.
2. Choose the suitable objective lens and look through the eyepiece.
3. Rotate the coarse focus and the fine focus to see a clear image for the sample on the slide.
4. Replace the slide of plant cells with a prepared slide of animal cells.

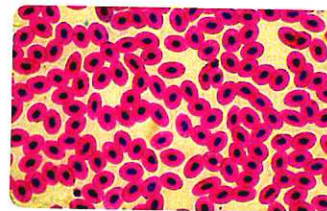


**Observations**

- The shape of the plant cells differs from that of the animal cells.

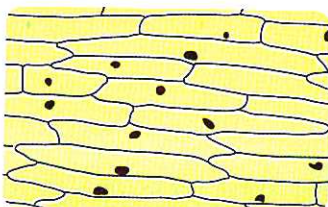


Plant cells



Animal cells

- The samples appear more clearly when using the "high power objective lens".



Low power objective lens



High power objective lens

## ▶ Conclusions

1. Microscope helps us to see and examine tiny things accurately.
2. The bodies of living organisms (plants or animals) are made up of tiny units called "cells".



## Check your understanding

### ▶ Put (✓) or (✗) :

1. Microscopes form magnified images for cells. ( )
2. Lenses are main components in the structure of microscope. ( )
3. All objective lenses of microscope have the same focusing power. ( )
4. The cell is the building unit of living organisms bodies. ( )
5. Robert Hooke was the first person who use the word cell. ( )

In the Assessment Book :

Try to answer :

Self-Assessment ②



# Exercises on Lesson 2

● Understand

● Apply

● Higher Thinking Skills

## 1 Choose the correct answer :

- Microscopes help scientists to discover that ..... is the building unit of living organisms bodies.  
a. brick                      b. cell                      c. the Sun                      d. energy
- The body of simple living organisms as bacteria consists of ..... (Minia 2024)  
a. one cell only.                      b. different cells.  
c. many cells.                      d. ten cells only.
- You can see the cells of all the following under microscope, except .....  
a. onion.                      b. human skin.                      c. leaf.                      d. stone. (Giza 2024)
- All the following are from parts of microscope, except .....  
a. eyepiece.                      b. stage.                      c. coverslip.                      d. mirror.
- When you examine a piece of onion under microscope using the low power objective lens, you will see the cells of onion in ..... size.  
a. small                      b. medium                      c. big                      d. very big
- The modern microscope helps scientists to discover all the following information about the cell, except that .....  
a. the cell is the building unit of living organisms bodies.  
b. some simple living organisms consists of one cell only.  
c. living organisms that contain complex systems consists of many cells.  
d. all living cells have the same parts which have the same function.

## 2 Put (✓) or (x) :

- Robert Hooke used his microscope to observe cells of some samples of plant parts. ( )
- The body of a living organism that contains complex systems, consists of one cell only. ( )
- All objective lenses of microscope have the same focusing power. ( )
- The modern microscopes help scientists to discover more information about the cell. ( )
- We can see the examined sample in bigger size when using the high power objective lens. ( )
- The function of coarse focus and fine focus is making the image of a sample very clear under microscope. ( )