


Subject –Science

Class- 6

Topic – chapter-7 Cell

13. The cells that have a true nucleus bound by a nuclear membrane are called eukaryotic cells.



### Exercise

(Use Cordova Smart Class Software on the smart board in class to do these exercises.)

**A Tick (✓) the correct options.**

- Who discovered the cell?  
(a) Robert Brown ☐ (b) Robert Hooke ✓  
(c) Schleiden ☐ (d) Schwann ☐
- Which of these is absent in the animal cell?  
(a) mitochondria ☐ (b) nucleus ☐  
(c) cytoplasm ☐ (d) plastid ✓
- A group of similar cells performing a specific function is called  
(a) organ ☐ (b) cell ☐  
(c) system ☐ (d) tissue ✓

**B Fill in the blanks.**

- Thread-like structures found in the nucleus are called chromosomes.
- Amoeba is a unicellular organism.

3. An organism made up of more than one cell is called multicellular organism.

4. Nerve cells are long and branched.

#### C Short answer type questions

1. What is the difference between prokaryotic and eukaryotic cell? make a table
2. Define a tissue. 70
3. Why is mitochondria called the power house of the cell? 67
4. Why is lysosome known as suicidal bag? 68

#### D Long answer type questions

1. Explain the following parts of the cell along with diagrams.  
(a) nucleus 69 (b) cell membrane 66 (c) cytoplasm 67
2. What are the differences between animal cell and plant cell? ✓
3. Draw a labelled diagram of the animal cell.

#### E Practical Work

1. Make a chart of the cell structure.
2. Collect more information about cell from the website:  
[www.enchantedlearning.com/subjects/plants/cell/sj](http://www.enchantedlearning.com/subjects/plants/cell/sj)  
and prepare an article.
3. Using gaming method, display the cell organelles and their functions in the classroom. Various students will play the role of mitochondria, endoplasmic reticulum, plastid, vacuole, etc., and explain about these. One student will play the role of an anchor.
4. With the help of your teacher, observe a permanent slide of *Amoeba* under the microscope. Apart from this, collect water from pond and put a drop of pond water on an empty slide and observe the organisms present in it.

### ADDITIONAL QUESTIONS FOR PRACTICE

#### A Tick (✓) the correct options.

1. The green pigment, chlorophyll is found in  
(a) cell wall ☐ (b) ☒ plastid  
(c) lysosome ☐ (d) endoplasmic reticulum ☐
2. Which of the following are called the 'kitchen of the cell'?  
(a) ☒ chloroplasts ☐ (b) vacuoles ☐ (c) ribosomes ☐ (d) lysosomes ☐
3. \_\_\_\_\_ is found only in animal cells.  
(a) Nucleus ☐ (b) Plastid ☐ (c) ☒ Centrosome ☐ (d) Vacuole ☐
4. Which of the following do not have a nuclear membrane around the chromatin material?  
(a) ☒ prokaryotes ☐ (b) eukaryotes ☐ (c) both (a) and (b) ☐ (d) none of these ☐

#### Fill in the blanks.

1. The size of the cells and their organelles is measured by fractions of a millimetre.
2. Some cells like amoeba and wbc do not have a definite shape.



3. The size of the cell is related to its function.
4. Different tissues join together to form an organ.
5. Plasma membrane is made up of proteins and lipids.
6. Ribosomes are attached to the rough endoplasmic reticulum.
7. Centrosome consists of two centrioles.
8. Genes are responsible for passing genetic characters from parents to offspring.
9. Bacteria are examples of prokaryotes.

#### Short answer questions

- ✓ 1. What is a cell? Name the RBC smallest and the nerve cell largest cells in a human body.
2. How was the cell discovered? 63
- ✗ 3. Give an example to show that the size of cells has no relation with the size of the body of an organism. It is related to the function of the cell.
4. Why is plasma membrane called selectively permeable membrane? in long (b)
5. Why are chloroplasts called the kitchen of the cell? 68

#### Long answer questions

1. How are multicellular organisms different from unicellular organisms? Give two examples of each.
- ✗ 2. What are the different shapes of cells? Draw the shapes of a RBC, stoma and nerve cell.
3. Explain the different levels of organisation. 65
4. What are cell organelles? Name them and write their functions. Eq 1) Long (don)
- ✗ 5. Describe the structure of a cell. in ex long (don)

#### Think and answer

## Chapter 7: Cell

### Multiple Choice Questions

1. (b) 2. (b)

### Multiple Choice Questions

1. (d) 2. (b)

### Multiple Choice Questions

1. (a) 2. (b)

### Multiple Choice Questions

1. (a) 2. (c)

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### EXERCISE

#### A. Tick (✓) the correct options.

1. (b) 2. (d) 3. (d)

#### B. Fill in the blanks.

1. chromosomes 2. unicellular  
3. multicellular 4. long, branched

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#### C. Short answer type questions

S. No.	Prokaryotic cell	Eukaryotic cell
(i)	The cells that do not have a nuclear membrane around the chromatin material are called prokaryotic cell.	The cells that have a true nucleus bound by a nuclear membrane are called eukaryotic cells.
(ii)	The organisms that have prokaryotic cell are called prokaryotes.	The organisms that have eukaryotic cells are called eukaryotes.
	Bacteria are examples of prokaryotes.	All plants and animals are examples of eukaryotes.

- A group of similar cells, performing a specific function, join together to form a tissue.
- Mitochondria are the main site of cell respiration. They use oxygen to oxidise food to release energy. This energy is stored in the form of ATP (Adenosine triphosphate). That is why, mitochondria are called the power house of the cell.
- Lysosomes contain digestive enzymes and digest worn out cell organelles. When the cell is injured, lysosome ruptures and the digestive juices digest their own cell. Thus, they are called suicidal bags of the cell.

#### D. Long answer type questions

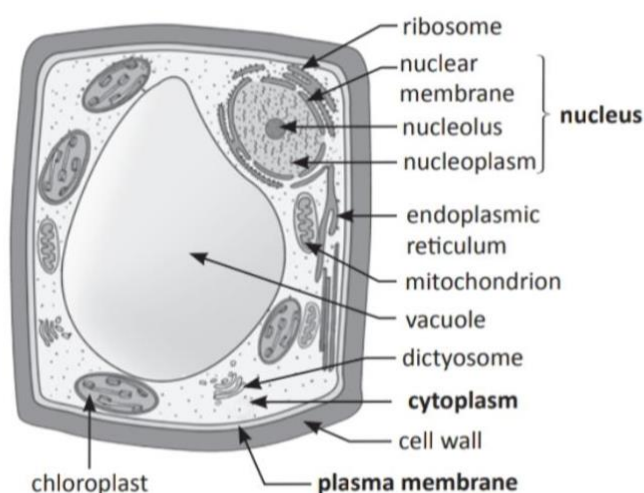
- (a) **Nucleus:** It is generally spherical and located in the centre of the cell. In plant cells, it is shifted towards one side because of the presence of a large central vacuole.

The nucleus has the following four parts:

- Nuclear membrane:** Nucleus is separated from the cytoplasm by a double membrane called the nuclear membrane. The nuclear membrane is also porous and allows the movement of materials between the cytoplasm and the nucleus.
- Nucleoplasm:** A dense fluid in the nucleus is called nucleoplasm.
- Nucleolus:** It is a small, spherical body present in the nucleoplasm.
- Chromatin material:** Chromatin material is thin thread-like structure, composed of deoxyribonucleic acid (DNA). This contains genes.

**Functions:** The nucleus controls all activities of the cell. It is

responsible for passing genetic characters from parents to the offspring.



Structure of a plant cell

- (b) **Cell membrane:** Every cell is bound by a thin delicate membrane called cell membrane or plasma membrane. It is made up of fats and proteins. The plasma membrane separates cells from one another and from the surrounding medium. In a plant cell, the cell membrane is surrounded by another rigid layer called cell wall.

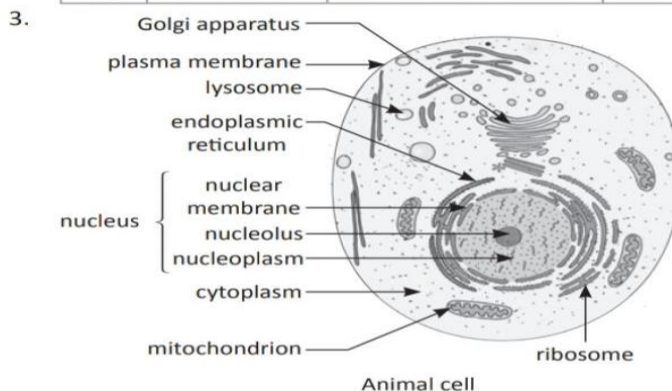
**Functions:**

- (i) Plasma membrane is porous and allows the entry and exit of only selected substances. It also prevents the movement of some other substances across it. Thus, it is also called selectively permeable membrane.
  - (ii) It provides an outer boundary to the cell and protects the cell from injury.
  - (iii) It maintains the shape of the cell.
- (c) **Cytoplasm:** Cytoplasm is a thick, jelly-like fluid present between the cell membrane and the nucleus. There are many small cytoplasmic bodies in the cytoplasm. These are called cell organelles. The cell organelles like, mitochondria, endoplasmic reticulum, golgi apparatus, ribosomes, lysosomes, centrosome, vacuoles and plastids play an active role in the functioning of the cell.

2.	S. No.	Parameters	Plant cell	Animal cell
	(i)	Size	Plant cells are larger in size.	Animal cells are smaller than plant cells.
	(ii)	Cell wall	Cell wall is present.	Cell wall is absent.
	(iii)	Plastids	Plastids are present.	Plastids are absent.
	(iv)	Vacuoles	A single large vacuole is present.	Generally absent. If present, few small sized vacuoles are found.



(v)	Golgi apparatus	Have many golgi apparatus scattered in the cytoplasm	Have well- developed golgi apparatus that are present near the nucleus
(vi)	Centrosome	Centrosome is absent.	Centrosome is present.



#### E. Practical Work

- Students will do this practical work by themselves.
- Students will do this practical work by themselves.
- Teacher/Parents may help the students to perform this practical work.
- Teacher/Parents may help the students to perform this practical work.

#### ADDITIONAL QUESTIONS FOR PRACTICE

##### A. Tick (✓) the correct options.

- (b)
- (a)
- (c)
- (a)

##### B. Fill in the blanks.

- millimetre
- Amoeba*, white blood cells
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- organ
- proteins, fats
- rough
- centrioles
- Genes
- prokaryotes

##### C. Short answer questions

- Cell is the basic structural and functional unit of life. The smallest cell is red blood cell and the longest cell is nerve cell in the human body.
- Cell was discovered by an English scientist, Robert Hooke in 1665. He took thin slices of cork and observed them under his self-designed microscope. He noticed a large number of compartments in the cork slice resembling the structure of a honey comb and coined the term 'cell' for each box.

#### SCIENCE-6

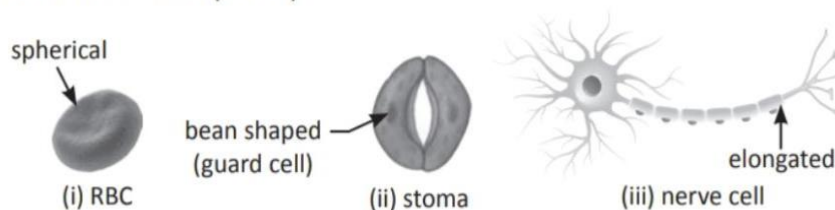
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- The function of nerve cells is to transmit messages, so they are elongated in both rats and human beings. Although, a rat is much smaller in size than a human being. This example clearly shows that the size of the cells has no relation with the size of the body of an organism, but is related to its function.
- Plasma membrane is porous and allows the entry and exit of only selected substances. Also, it prevents the movement of some other substances across it. Thus, it is called as selectively permeable membrane.
- Chloroplasts contain chlorophyll that helps in the process of photosynthesis, in green parts of plants. Thus, they are called the kitchen of the cell.

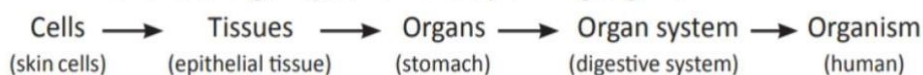
##### D. Long answer questions

1.	<b>S. No.</b>	<b>Multicellular organisms</b>	<b>Unicellular organisms</b>
	(i)	Organisms made up of many cells are called multicellular organisms.	Organisms made up of a single cell are called unicellular organisms.
	(ii)	Cells are specialised to perform a particular function.	All the functions are performed by a single cell.
		Examples are tree and grass.	Example are <i>Amoeba</i> and <i>Paramecium</i> .

2. Cells show a great variation in their shapes such as spherical, spindle-shaped, branched, bean shaped, elongated and so on. Some cells do not have a definite shape, i.e., they have changing shapes, e.g., *Amoeba* and white blood cells (WBCs).



3. In multicellular organisms, cells represent the lowest level of organisation. The cells join together to perform a specific function. These joined cells form a tissue. Different tissues join together to form an organ. Each organ performs a specific function. All the organs that work together to perform a specific life function form an organ system. The various organ systems make up a living organism.



4. The small cytoplasmic bodies present in the cytoplasm are called cell organelles. The following cell organelles in cytoplasm play an active role in the functioning of the cell—

- (i) **Mitochondria:** They are the main site of cell respiration. They use oxygen to oxidise food to release energy. This energy is stored in the form of ATP (Adenosine triphosphate). For this reason, mitochondria are called the power house of the cell.
- (ii) **Endoplasmic reticulum:** It is of two types— rough endoplasmic reticulum and smooth endoplasmic reticulum. Ribosomes are attached to the rough endoplasmic reticulum and perform the function of protein synthesis.
- (iii) **Golgi Apparatus:** Golgi apparatus acts as a way station for the storage, processing and packaging of various cellular secretions.
- (iv) **Ribosomes:** They help in protein synthesis.
- (v) **Lysosomes:** They contain digestive enzymes. They digest worn out cell organelles.
- (vi) **Centrosome:** It helps in cell division.
- (vii) **Vacuoles:** They help the cell to remain in shape. They store food and water in the cell.
- (viii) **Plastids:** They are of three types— chloroplasts, leucoplast and chromoplast. Chloroplast are involved in photosynthesis, in green parts of plants. So, they are called the kitchen of the cell.

and water in the cell.

(viii) **Plastids:** They are of three types— chloroplasts, leucoplast and chromoplast. Chloroplast are involved in photosynthesis, in green parts of plants. So, they are called the kitchen of the cell.

5. A typical cell consists of three parts– cell membrane, cytoplasm and nucleus.

(a) **Cell membrane:** A thin, delicate membrane surrounding the cell is called cell membrane. It is made up of fats and proteins. It separates cells from one another and from surrounding medium. It helps in the movement of substances between cell and its environment. It also maintains the shape of the cell.

(b) **Cytoplasm:** It is a thick, jelly-like fluid present between the cell membrane and the nucleus. There are many small cytoplasmic bodies called cell organelles, present in the cytoplasm. Some of them are:

- |                       |                            |
|-----------------------|----------------------------|
| (i) Mitochondria      | (ii) Endoplasmic reticulum |
| (iii) Golgi Apparatus | (iv) Ribosomes             |
| (v) Lysosomes         | (vi) Centrosome            |
| (vii) Vacuoles        | (viii) Plastids            |

(c) **Nucleus:** Nucleus is the most important part of the living cell. It is generally spherical and located in the centre of the cell. The nucleus has the following four parts:

(i) **Nuclear membrane:** Nucleus is separated from the cytoplasm by a double membrane called the nuclear membrane. This membrane is also porous and allows the movement of selected materials between the cytoplasm and the nucleus.

(ii) **Nucleoplasm:** A dense fluid in the nucleus is called nucleoplasm.

(iii) **Nucleolus:** It is a small, spherical body present in the nucleoplasm.

(iv) **Chromatin material:** Chromatin material is thin thread-like structure, composed of deoxyribonucleic acid (DNA). This contain genes.