

## Chapter 5 The Fundamental Unit of Life

**Question 1. Who discovered cells, and how?**

**Answer:** Robert Hooke discovered cells in 1665 while examining a thin slice of cork through a self-designed microscope. He saw that the cork resembled the structure of a honey comb consisting of many little compartments. These small boxes are called cells.

**Question 2. Why the cell is called the structural and Junctional unit of life?**

**Answer:** A cell is capable of independently carrying out all necessary activities of life. So, they are called basic or functional unit of life.

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**Question 1. How do substances like CO<sub>2</sub> and water move in and out of the cell? Discuss.**

**Answer:** CO<sub>2</sub> moves by diffusion and H<sub>2</sub>O move by osmosis through cell membrane.

**Question 2. Why is the plasma membrane called a selectively permeable membrane?**

**Answer:** It is called selectively permeable membrane because it allows the entry and exit of some substances, not all.

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**Question 1. Fill in the gaps in the following table illustrating differences between prokaryotic and eukaryotic cells.**

**Answer:**

<b>Prokaryotic Cell</b>	<b>Eukaryotic</b>
1. <b>Size:</b> Generally small (1–10 μm) (1μm = 10 <sup>-6</sup> m)	1. <b>Size:</b> Generally large (5–100 μm)
2. Nuclear region is poorly defined due to absence of a nuclear membrane and known as nucleoid.	2. Nuclear region well defined and surrounded by a nuclear membrane.
3. There is a single chromosome.	3. There are more than one chromosomes.
4. Membrane-bound cell organelles absent.	4. Membrane-bound cell organelles present.

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**Question 1. Can you name the two organelles we have studied that contain their own genetic material?**

**Answer:** The two organelles which have their own genetic material are:

1. Mitochondria 2. Plastids

**Question 2. If the organisation of a cell is destroyed due to some physical or chemical influence, what will happen?**

**Answer:** The cell will not be able to revive and lysosomes will digest it.

**Question 3. Why are lysosomes known as suicide bags?**

**Answer:** When the cell gets damaged, lysosomes may burst, and the enzymes digest their own cell. Therefore lysosomes are known as suicide bags.

**Question 4. Where are proteins synthesised inside the cell?**

**Answer:** The proteins are synthesised in the ribosomes that are also known as protein factories.

### Questions From NCERT Textbook for Class 9 Science

**Question 1. Make a comparison and write down ways in which plant cells are also different from animal cells.**

**Answer:**

<b>Plant Cell</b>	<b>Animal Cell</b>
1. Plant cells have cell wall.	1. Animal cells don't have a cell wall.
2. They contain chloroplast.	2. They don't have chloroplasts.
3. They do not have centriole.	3. Centriole is present in them.
4. Vacuole is large and present in centre of the cell.	4. Vacuole is small.
5. Nucleus is present in the side of the plant cell.	5. Nucleus is present in the centre of the animal cell.

**Question 2. How is prokaryotic cell different from a eukaryotic cell?**

**Answer:** Prokaryotic cell is generally smaller in size (1-10 pm), nuclear region is poorly defined, the cell organelles are not membrane-bound and has a single chromosome. Eukaryotic cell is generally larger in size (5-100 pm), nuclear region is well defined with nuclear membrane. Membrane-bound cell organelles are present and has more than one chromosome.

**Question 3. What would happen if the plasma membrane ruptures or breaks down?**

**Answer:** If plasma membrane ruptures or breaks down then molecules of some substances will freely move in and out.

**Question 4. What would happen to the life of a cell if there was no Golgi apparatus?**

**Answer:** Golgi apparatus has the function of storage, modification and packaging of the products in vesicles. If there were no Golgi bodies, packaging and dispatching of materials synthesised by the cell will be stocked.

**Question 5. Which organelle is known as the powerhouse of the cell? Why?**

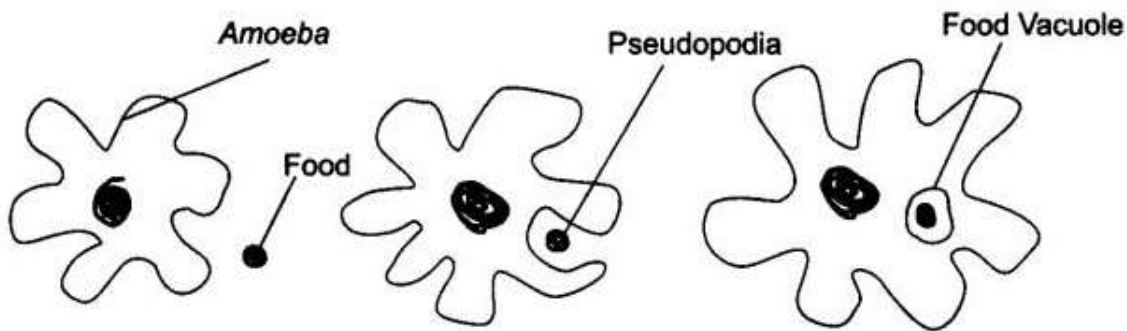
**Answer:** Mitochondria is known as powerhouse of the cell because it releases the energy required for different activities of life.

**Question 6. Where do the lipids and proteins constituting the cell membrane get synthesised?**

**Answer:** Lipids and proteins are synthesised in ER [Endoplasmic Reticulum].

**Question 7. How does Amoeba obtain it's food?**

**Answer:** Amoeba take it's food by the cell membrane which forms the food vacuole.



**Endocytosis in Amoeba**

**Question 8. What is osmosis?**

**Answer:** Osmosis is the process of movement of water molecule from a region of higher water concentration through a semi-permeable membrane to a region of lower water concentration.

**Question 9. Carry out the following osmosis experiment:**

Take four peeled potato halves and scoop each one out to make potato cups, one of these potato cups should be made from a boiled potato. Put each potato cup in a trough containing water.

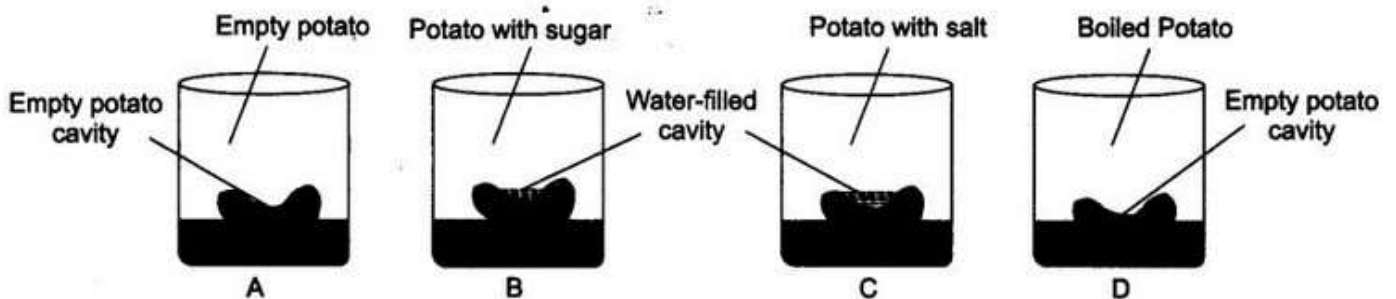
Now,

- (a) Keep cup A empty
- (b) Put one teaspoon sugar in cup B
- (c) Put one teaspoon salt in cup C
- (d) Put one teaspoon sugar in the boiled potato cup D

Keep these for two hours. Then observe the four potato cups and answer the following:

- (i) Explain why water gathers in the hollowed portion of B and C.
- (ii) Why is potato A necessary for this experiment?
- (iii) Explain why water does not gather in the hollowed out portions of A and D.

**Answer:**



(i) Water gathers in B and C because in both the situations there is difference in the concentration of water in the trough and water in the cup of Potato. Hence, osmosis takes place as the potato cells act as a semi-permeable membrane.

(ii) Potato A is necessary for this experiment for comparison, it acts as a control.

(iii) Water does not gather in the hollowed out portions of A and D. As cup of A does not have change in the concentration for water to flow. For osmosis to occur one of the concentration should be higher than the other.

In cup D, the cells are dead and hence the semi-permeable membrane does not exist for the flow of water and no osmosis takes place.