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Cells

Part	Function
cytoplasm	This transparent, jelly-like substance forms the bulk of the cell. It allows the small structures that are present in it to move about. It is also the place where many cellular activities take place.
cell membrane	This thin layer of proteins and fats holds the cytoplasm together. It is semi-permeable , i.e. it allows some substances to pass through it but blocks the others.
nucleus	The nucleus controls all the activities of the cell. It contains DNA (deoxyribonucleic acid) which carries genetic information that has been passed down from previous generations. It also controls the structure and purpose of the cell itself.
cell wall*	Made up of a thick, stiff material known as cellulose, the cell wall supports the cell and gives it a regular shape. The cell wall is semi-permeable, so it allows small substances to enter and leave freely.
chloroplasts*	This structure contains the green pigment, chlorophyll. It enables the plant to photosynthesize and make food.
vacuole#	They are essentially air spaces within the cytoplasm of the cell, containing cell sap. In a plant cell, there is one large central vacuole in the middle containing cell sap. In an animal cell, the vacuoles are small and numerous.

* only present in plant cells

Not in MOE syllabus

There are similarities and differences between a plant cell and an animal cell.

Characteristics	Animal cell	Plant cell
Similarities	<ul style="list-style-type: none"> Both have cytoplasm, a cell membrane, a nucleus and vacuole(s). 	
Differences	<ul style="list-style-type: none"> No cellulose cell wall, so the animal cell has an irregular shape No chloroplasts, so the animal cell cannot make its own food 	<ul style="list-style-type: none"> Has a cellulose cell wall to support the plant cell and give it its regular shape Has chloroplasts which contain chlorophyll, enabling the green plant to make food during photosynthesis



Alert Most cells contain a nucleus. Without the nucleus, the cell will die.

However, the red blood cell is an exception. It has no nucleus, yet it is able to survive.

Cells

+ Reproduction Of Cells

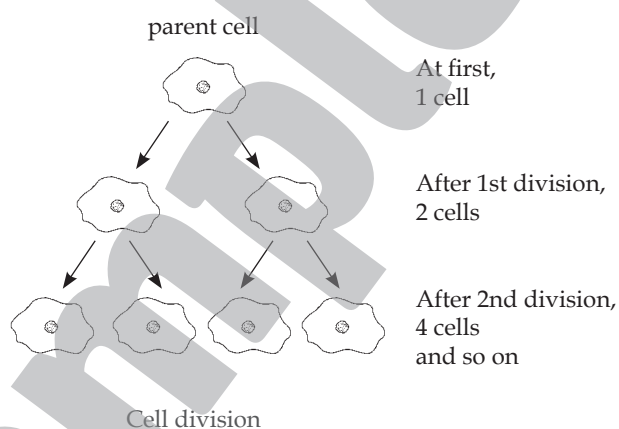
Cells cannot live forever. Although different cells have different lifespans which range from a few days to a few months, all cells will eventually die.

When cells die, new cells have to replace them.

Cells divide to form new cells.

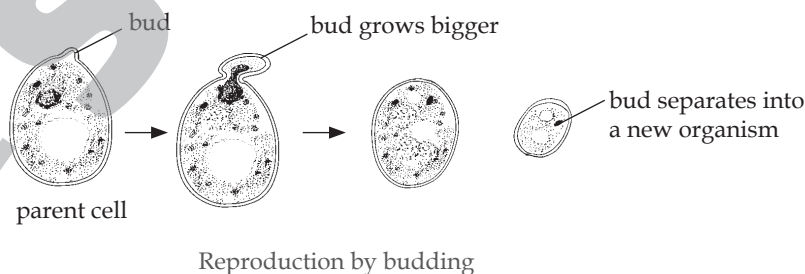
One cell divides into two separate cells. The two cells in turn divide to form four cells and so on. This is known as **cell division**.

Cell division is necessary to **replace new cells** when they are destroyed or damaged. It is also necessary so that the **organisms can grow**.



The newly-divided cells are identical to their parent cells.

Some single-celled organisms such as bacteria and yeast reproduce in a special way. This is known as **budding**.

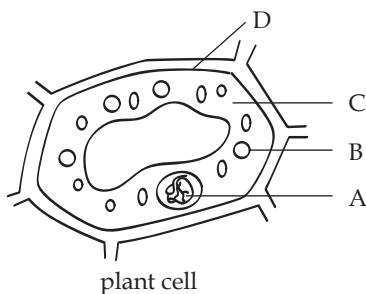


The parent cell develops a small bud. The bud grows bigger and bigger until it attains the right size. It then breaks away from its parent and forms a new, identical cell.

Although cells normally divide to form new identical cells, sometimes an abnormal division may take place. The cells may divide uncontrollably to form tumours which can then lead to cancer.

The Unit Of Life

1. The diagram below shows a microscopic view of a plant cell.



Which part of the plant cell enables it to make food in the presence of sunlight?

- (1) A
- (2) B
- (3) C
- (4) D

()

2. Which parts of a cell can be found in both animal and plant cells?

- A. nucleus
- B. cytoplasm
- C. cell membrane
- D. cell wall
- E. chloroplast

- (1) A and B only
- (2) A, B and C only
- (3) A, B, C and D only
- (4) A, B, C, D and E

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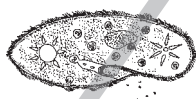
3. The diagrams below show four different unicellular organisms. Which one of them is able to make its own food?



- (1) amoeba



- (3) euglena



- (2) paramecium



- (4) yeast

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The Unit Of Life

4. Which one of the following cell structures is **incorrectly** matched to its function?

	Cell structure	Function
(1)	cell wall	• controls the movement of substances in and out of the cell
(2)	nucleus	• contains genetic information that is passed on to the next generation
(3)	cytoplasm	• contains many cell parts in a jelly-like substance
(4)	chloroplast	• contains green pigment to trap sunlight to make food

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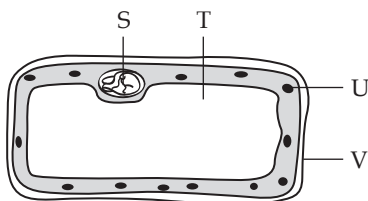
5. Which one of the following represent the parts which can be found in an onion leaf cell but not in a human cheek cell?

- (1) chloroplast, cytoplasm and cell sap
- (2) chloroplast, cell wall and cell membrane
- (3) cell wall, cell membrane and nucleus
- (4) cell wall, chloroplast, cell sap

()

The Unit Of Life

The diagram below shows a specimen of a plant cell under a microscope. Study the diagram carefully and answer questions 1 and 2.



- A group of bioengineers wants to modify some of the genetic information in the plant cell so that the cell is able to produce a new substance, P. Which part of the plant cell should the bioengineers modify in order to achieve their aim?

 - S
 - T
 - U
 - V

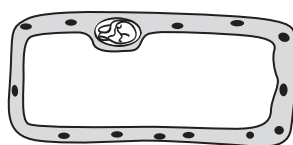
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- The group has successfully modified the plant cell which causes it to produce the new substance, P. However, P is not able to move out of the cell. Which part of the cell is preventing the new substance from moving out?

 - cell wall
 - cell membrane
 - cell sap
 - cytoplasm

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- It was found that there were 128 daughter cells after a parent cell divided for the 4th time. How many parent cells were there in the first place?

 - 2
 - 8
 - 16
 - 32

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- A specimen of an unidentified cell with a missing part had been shown to a student. However, she was able to make a correct guess by naming it as a plant cell.



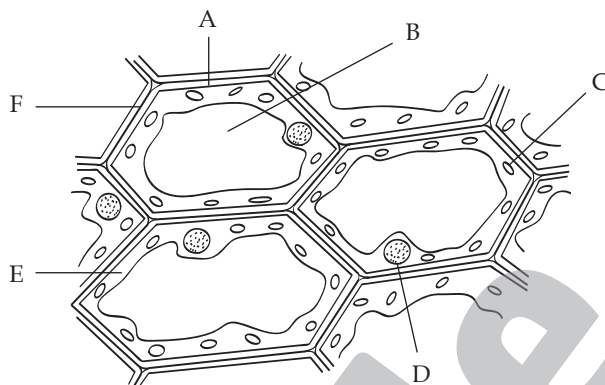
unidentified cell

What observation had enabled the student to make a correct guess?

- There are chloroplasts present in the cell which can only be found in plant cells.
 - There is a cell wall surrounding the cell which gives it its regular shape.
 - There is a nucleus in the cell which controls all the activities in the cell.
 - There is a cell membrane which surrounds the cytoplasm.
- ()

The Unit Of Life

5. The diagram below shows parts of plant cells.



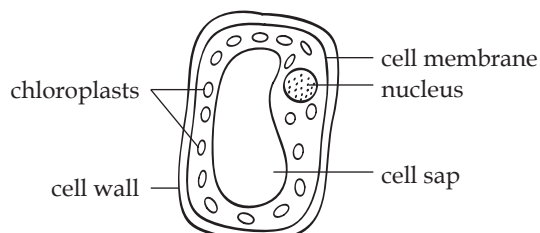
Which of the following parts of the cells have been matched correctly to the information provided in the table below?

	Can also be found in animal cells	Contains all the genetic information	Can only be found in plant cells
(1)	A, D, E, F	C	C, F
(2)	A, D	D	B, C, F
(3)	D, E	C	C, F
(4)	A, D, E	D	B, C, F

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The Unit Of Life

The diagram below shows a microscopic view of a plant cell. Study the diagram carefully and answer questions 1 and 2.



- Which part of the plant can the above cell be found?
 - bark of the tree
 - underside of the leaf
 - root hair
 - skin of the fruit

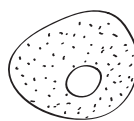
()
- Which part of the plant cell controls substances that move in and out of the cell?
 - cell membrane
 - nucleus
 - cell sap
 - cell wall

()
- Which of the following structures can be found in an animal cell?
 - nucleus, cell membrane, cytoplasm
 - nucleus, cell wall, cytoplasm
 - cell membrane, vacuole, nucleus
 - cytoplasm, chloroplasts, cell membrane

()
- The diagrams below show two different types of cells.



Cell A



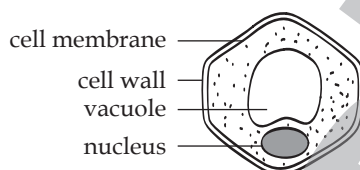
Cell B

Based on the diagrams above, which statement(s) is/are correct?

- Cell A has a cell wall but not Cell B.
 - Cell B has chloroplasts but not Cell A.
 - Both cells A and B have a nucleus each.
 - Cell B is an animal cell as it has no cell membrane.
- A only
 - A and C only
 - B and C only
 - A, C and D only
- ()

The Unit Of Life

5. Miranda wanted to view a specimen of Cell H under a microscope but realized that she could not do so as most parts of the cell were colourless. She then took out the specimen and added a few drops of coloured solution. When Miranda observed the specimen under the microscope after this, she noticed that some parts of the cell had been stained by the solution. Which part of the cell allowed the coloured solution to enter it?
- (1) chloroplast
 - (2) cell wall
 - (3) nucleus
 - (4) cell membrane
- ()
6. A cell is taken from a multicellular organism and observed under a microscope as shown below.



Which part(s) of the multicellular organism could the above cell be removed from?

- A. root hair of a plant
- B. leaf of a flowering plant
- C. skin of an animal
- D. petal of a flowering plant
- E. cheek of an animal

- (1) A only
 - (2) A and D only
 - (3) C and E only
 - (4) A, B and C only
- ()