

The Basic Structure of a Cell

Level: S1

Topic: Basic Structure of a Cell (Section 3.1 of Unit 3)

Introduction:

This ELA is conducted after students have carried out a laboratory class on how to prepare slides of plant and animal cells, such as onion cells and ox-eye cells, and observe them under a microscope. The laboratory class is a CMI lesson, but when the teacher introduces the Chinese terms of the parts of a cell, he/she should also introduce the English terms at the same time.

In this ELA, the teacher uses PowerPoint slides to go through the basic cell structures and their functions. Then, students are asked to complete a worksheet, which requires them to label diagrams and complete a cloze (or fill-in-the-blank) passage. The cloze passage serves as a scaffold for students to construct meanings about the functions of the cell structures. This ELA lasts for a period.

Lesson Plan – The Basic Structure of a Cell

Content	After completing the activity, students should be able to:
Objectives:	<ul style="list-style-type: none">• identify the parts of a cell—nucleus, cytoplasm, cell membrane, and cell wall (in plant)—and state their functions• identify the difference between the structure of a plant cell and that of an animal cell
Language	After completing the activity, students should be able to:
Objectives:	<ul style="list-style-type: none">• understand and use the English terms related to the basic structure of a cell (e.g., <i>structure, cell, cell membrane, cell wall, cytoplasm, nucleus</i>) and the functions of different parts of a cell (e.g., <i>controls activities, contains DNA, carries information, produce new cells, what goes in, what goes out, gives shape and support, plant cell, animal cell</i>);• understand and use the English expressions for describing the functions of the different parts of a cell, e.g.,<ul style="list-style-type: none">• <i>Different parts of a cell carry out different activities so that the cell can function normally.</i>• <i>The nucleus is the place which controls the activities of a cell. It also contains DNA, which carries the information for producing new cells.</i>• <i>The cytoplasm is where many cell activities happen.</i>• <i>The cell membrane controls what goes in and out of a cell.</i>• <i>The cell wall gives shape and support to a cell. It is found only in a plant cell, but not in an animal cell.</i>• explain why a plant cell has a regular shape but an animal cell does not, e.g.,<ul style="list-style-type: none">- <i>A plant cell has a regular shape because it has a cell wall.</i>- <i>An animal cell does not have a regular shape because it does not have a cell wall.</i>
Activities:	<ol style="list-style-type: none">1. Introducing the various types of cell and the functions of cell structures – whole-class activity (20 min)2. Worksheet completion – individual/pair work (20 min)
Materials:	Worksheet, Slides which introduce the various types of cell and the functions of the basic cell structures

Steps:

Introducing the various types of cell and the functions of cell structures– whole-class activity (20 min)

1. Using questions, the teacher reviews with the class the basic unit of living things and the instrument used for observing cells and other tiny objects.
2. With the aid of PowerPoint slides, the teacher introduces the various types of cell and functions of the basic cell structures.
As some of the functions are quite abstract, the teacher may use examples to help students understand the meanings. Where necessary, further diagrams should be used as illustration.
3. The following statements about a cell should be introduced in the slide presentation:
 - The nucleus *controls all the cell activities* (i.e. what the cell does). It also *contains DNA, which carries the information for producing new cells*.
 - The cytoplasm is *where many cell activities happen*.
 - The cell membrane *controls what goes in and out of a cell*.
 - The cell wall *gives shape and support* to a cell (only in a plant cell).

Worksheet completion – individual/pair work (20 min)

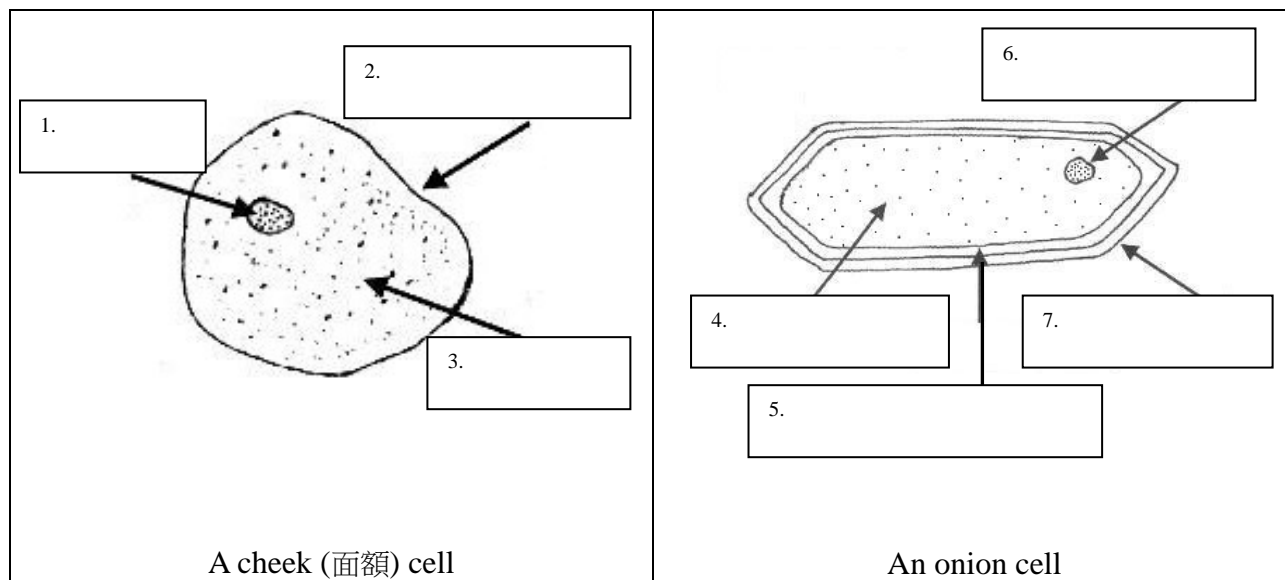
4. Students complete the worksheet. The teacher should encourage students to discuss with their neighbour if they come across any phrases they do not understand or any answers they are not sure.
5. The teacher monitors the class work and gives guidance where necessary.
6. The teacher checks the answers. He/she may ask students to take turns to come out and put the answers on the blackboard and have the class to check whether those answers are correct. In this way, students may be more cautious about their spelling.

The basic structure of a cell 細胞的基本結構

Structure of a cell

A. Label the parts of the following cells using the terms provided.

cell membrane 細胞膜	cell wall 細胞壁	cytoplasm 細胞質	nucleus 細胞核
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B. Which part is found in an onion cell but not in a cheek cell? _____

Functions of different parts of a cell

C. Complete the following paragraph using the words or phrases provided.

goes in and out of	controls (控制)	cell activities (活動)
shape and support (支撐)	information (資料)	

Different parts of a cell carry out different activities so that the cell can function normally. The nucleus is the place which ⁽¹⁾ _____ the activities of a cell. It also contains DNA, which carries the ⁽²⁾ _____ for producing new cells. The cytoplasm is where many ⁽³⁾ _____ happen. The cell membrane controls what ⁽⁴⁾ _____ a cell. The cell wall gives ⁽⁵⁾ _____ to a cell. It is found only in a plant cell, but not in an animal cell.

D. Why does a plant cell have a regular (有規則的) shape but an animal cell does not?

A plant cell has a regular shape because it has a _____, but an animal cell does not have a _____.

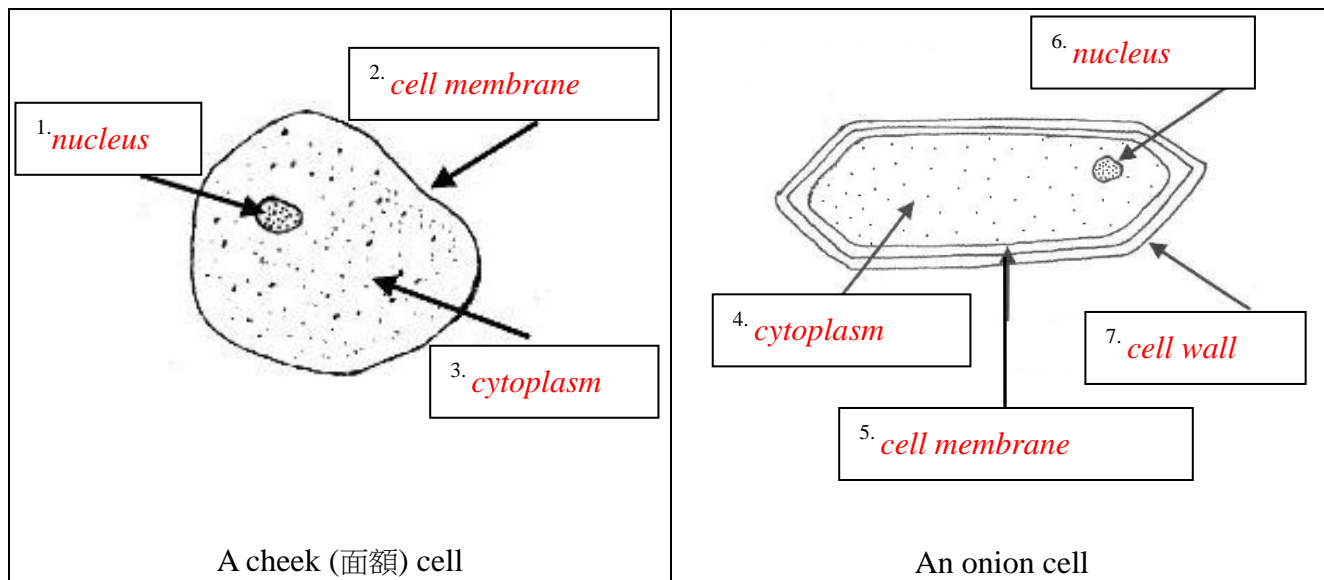
The basic structure of a cell 細胞的基本結構

Answers

Structure of a cell

A. Label the parts of the following cells using the terms provided.

cell membrane 細胞膜	cell wall 細胞壁	cytoplasm 細胞質	nucleus 細胞核
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B. Which part is found in an onion cell but not in a cheek cell? cell wall

Functions of different parts of a cell

C. Complete the following paragraph using the words or phrases provided.

goes in and out of	controls (控制)	cell activities (活動)
shape and support (支撐)	information (資料)	

Different parts of a cell carry out different activities so that the cell can function normally. The nucleus is the place which ⁽¹⁾ controls the activities of a cell. It also contains DNA, which carries the ⁽²⁾ information for producing new cells. The cytoplasm is where many ⁽³⁾ cell activities happen. The cell membrane controls what ⁽⁴⁾ goes in and out of a cell. The cell wall gives ⁽⁵⁾ shape and support to a cell. It is found only in a plant cell, but not in an animal cell.

D. Why does a plant cell have a regular (有規則的) shape but an animal cell does not?

A plant cell has a regular shape because it has a cell wall, but an animal cell does not have a cell wall.

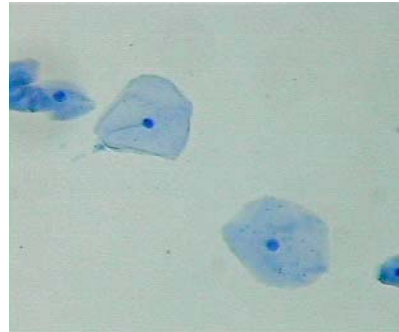
PowerPoint Slides: The Basic Structure of a Cell

The basic structure of a cell 細胞的基本結構

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May 2009

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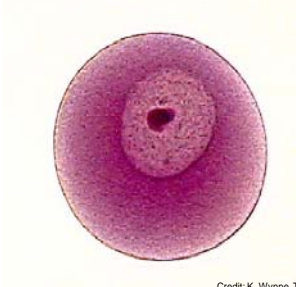
Example of animal cell (1): Cheek cell 面頰細胞



Credit: K. Wynne, Tyler Junior College

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Example of an animal cell (2): Egg 卵子



Credit: K. Wynne, Tyler Junior College

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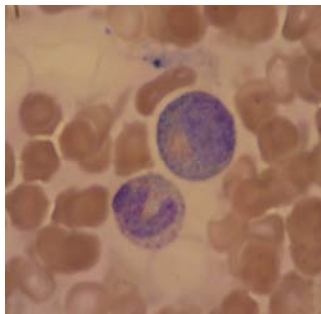
Example of an animal cell (3): Sperm 精子



Credit: K. Wynne, Tyler Junior College

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Example of an animal cell (4): White blood cell 白血球



Credit: Bobjalindo; available at http://commons.wikimedia.org/wiki/File:Toxic_granulation.JPG

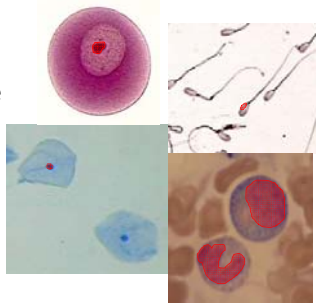
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- What parts do these animal cells have?

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1. Nucleus 細胞核

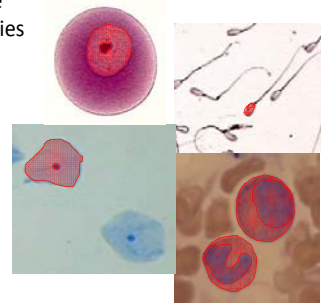
- Controls all the cell activities
- Contains DNA, which carries the information for producing new cells



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2. Cytoplasm 細胞質

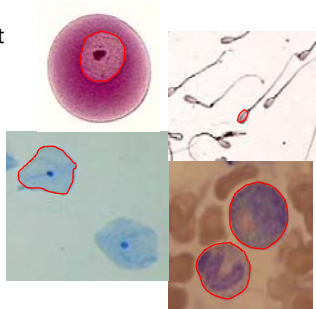
- The place where many cell activities happen



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3. Cell membrane 細胞膜

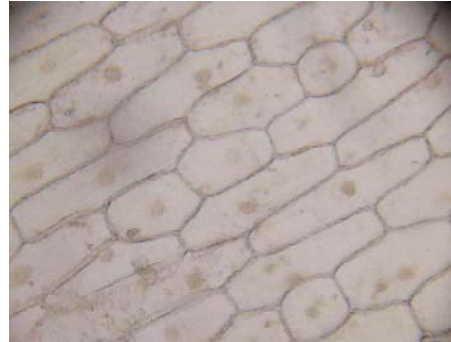
- Controls what goes into and out of a cell



Note: The thick layer surrounding the cell membrane of the egg cell is a jelly layer.

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Example of a plant cell (1): Onion cell 洋蔥細胞



Credit: Shaddock; available at <http://commons.wikimedia.org/wiki/File:Microphoto-cells-onion2.jpg>

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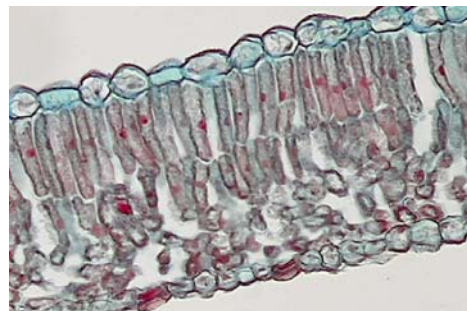
Example of a plant cell (2): Root tip cell 根尖細胞



Credit: Clematis; available at http://commons.wikimedia.org/wiki/File:Root_tip.JPG

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Example of a plant cell (3): mesophyll cell 葉肉細胞



Credit: K. Wynne, Tyler Junior College

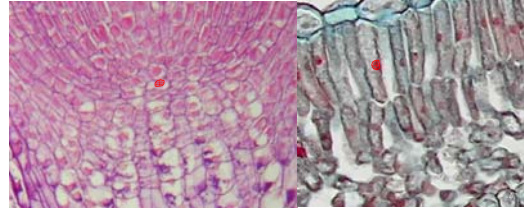
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- What parts do these plant cells have?

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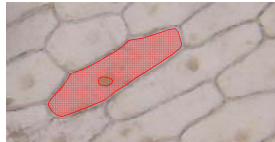
1. Nucleus 細胞核

- Controls all the cell activities
- Contains DNA, which carries the information for producing new cells



2. Cytoplasm 細胞質

- The place where many cell activities happen



3. Cell membrane 細胞膜

- Controls what goes into and out of a cell



4. Cell wall 細胞壁

- Gives shape and support to a cell

