

Cell Structure and Organisation

Simulation: edtechsims.com/cell-structure-organisation

Name: _____ Class: _____ Date: _____



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By the end of this activity, you should be able to:

- arrange the levels of organisation from organelle to organism, with examples
- identify the main organelles in plant and animal cells and state their functions
- compare the structure of plant and animal cells
- relate the structure of a cell to its function

Part A: Key Concepts

On the sim: Open the Key Concepts tab and read the Levels of Organisation table.

A1 Complete Table 1 by arranging the levels of organisation from the simplest to the most complex, and giving one example of each.

[6]

	Level of organisation	Example
1 (simplest)		
2		
3		
4		
5		
6 (most complex)		

Table 1

A2 Define the term tissue.

[1]

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.....

A3 The heart is described as an organ, not a tissue. Explain why.

[2]

.....

.....

Part B: Escape The Cell

On the sim: Open the Escape The Cell tab. Play the game for BOTH the plant cell and the animal cell.

B1 Record your results in Table 2.

	Plant cell	Animal cell
Number of stations		
Final score		
Hints used		

Table 2

B2 Name the organelle stations that appear in the plant cell game but NOT in the animal cell game. [1]

.....
B3 Complete Table 3 by stating the function of each organelle. [7]

Organelle	Function
Nucleus	
Cell membrane	
Cytoplasm	
Mitochondrion	
Vacuole	
Chloroplast	
Cell wall	

Table 3

Part C: Sorting Challenge

On the sim: Open the Sorting Challenge tab. Sort all the cards into Plant and Animal, then check your answers.

C1 Record your score.

My score: _____ / _____

C2 Write down any cards you placed in the wrong group, and explain why they belong in the other group. [2]

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.....

.....

Part D: Cell Biology Quiz and Summary

On the sim: Complete the Cell Biology Quiz tab, then read the Summary & Reflection tab.

D1 Record your quiz score.

My score: _____ / _____

D2 Choose one question you got wrong or found difficult. Explain the correct answer in your own words. [2]

.....

.....

.....

D3 Using the Plant vs Animal Cells table in Summary & Reflection, complete Table 4 with ✓ (present) or X (absent). [4]

Structure	Plant cell	Animal cell
Cell wall		
Chloroplasts		
Large central vacuole		
Nucleus		
Cell membrane		
Mitochondria		

Table 4

Part E: Practice Questions

E1 Fig. 1 shows a plant cell.

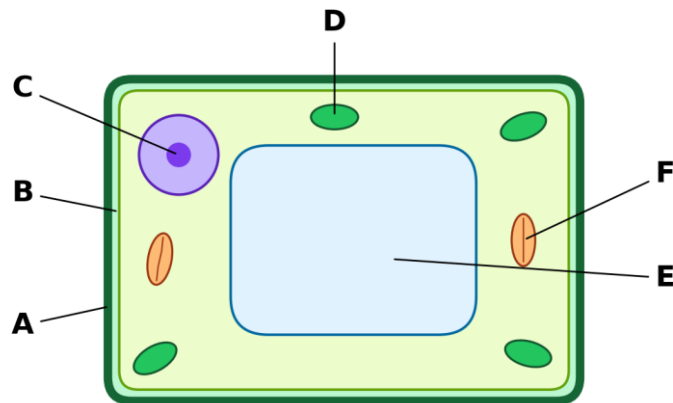


Fig. 1

(a) Name the structures labelled A to F.

[6]

A:

B:

C:

D:

E:

F:

(b) State one function of structure A and one function of structure E.

[2]

.....
.....

(c) A root hair cell is a plant cell that does not contain structure D. Suggest why.

[2]

.....
.....

E2 Fig. 2 shows an animal cell.

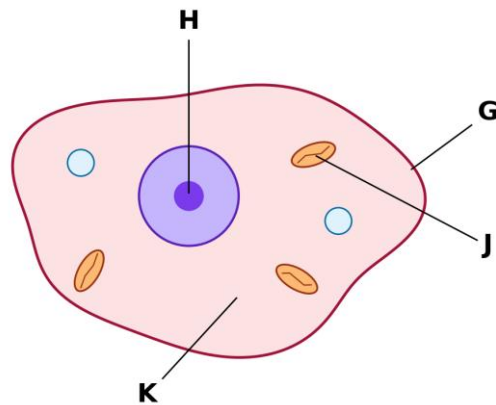


Fig. 2

(a) Name the structures labelled G, H, J and K. [4]

G:

H:

J:

K:

(b) Muscle cells contain many more of structure J than skin cells. Explain why. [2]

.....
.....

(c) State two structural differences between the cell in Fig. 1 and the cell in Fig. 2. [2]

.....
.....

Answer Key: Cell Structure and Organisation

Part A

A1

	Level	Example (accept any valid)
1	Organelle	Nucleus, mitochondrion, chloroplast
2	Cell	Red blood cell, root hair cell
3	Tissue	Muscle tissue, xylem
4	Organ	Heart, leaf, stomach
5	Organ system	Digestive system, circulatory system
6	Organism	Human, plant

A2 A group of similar cells that work together to perform a specific function.

A3 The heart is made up of several different tissues (e.g. muscle, nervous and connective tissue) working together to perform a function, so it is an organ.

Part B

B1 Results from the sim.

B2 Structures only in the plant game, e.g. chloroplast and cell wall (check against the sim).

B3

Organelle	Function
Nucleus	Contains genetic material (DNA) and controls cell activities
Cell membrane	Partially permeable; controls the movement of substances into and out of the cell
Cytoplasm	Site where most chemical reactions take place
Mitochondrion	Site of aerobic respiration, releasing energy for the cell
Vacuole	Stores cell sap (water, sugars, salts); in plant cells, keeps the cell turgid
Chloroplast	Contains chlorophyll; site of photosynthesis
Cell wall	Made of cellulose; fully permeable; supports the cell and gives it a fixed shape

Part C

C1–C2 Score and corrections from the sim.

Part D

D1–D2 Score from the sim; the student's correction should match the sim's explanation.

D3

Structure	Plant cell	Animal cell
Cell wall	✓	✗
Chloroplasts	✓	✗
Large central vacuole	✓	✗ (small, temporary vacuoles only)
Nucleus	✓	✓
Cell membrane	✓	✓
Mitochondria	✓	✓

Part E

E1(a) A: cell wall. B: cell membrane. C: nucleus. D: chloroplast. E: (large central) vacuole. F: mitochondrion.

E1(b) A: supports the cell / gives it a fixed shape / prevents it bursting. E: stores cell sap / keeps the cell turgid.

E1(c) Root hair cells are underground and receive no light, so they cannot photosynthesise; chloroplasts would have no use.

E2(a) G: cell membrane. H: nucleus. J: mitochondrion. K: cytoplasm.

E2(b) Muscle cells need a lot of energy for contraction. More mitochondria allow more aerobic respiration, releasing more energy.

E2(c) Any two: the plant cell has a cell wall; chloroplasts; a large central vacuole; a regular shape. The animal cell has none of these.