

Grade 8 Natural Science Worksheet

Plant and animal cells

Part One: Components of a plant cell

Fill in the gaps.

A plant cell has a cell wall which is made of (a) . The cell wall makes the cell strong and rigid in shape. There are gaps in the cell wall called (b) through which cells can communicate with each other.

Plant cells have a (c) inside their cell wall. The cell membrane encloses the (d) and organelles. The cell membrane is (e) to certain substances. This means that certain substances can move through the membrane.

The cytoplasm has a granular appearance. It is jelly-like and suspends the organelles.

The (f) contains all the information needed for the cell's functioning. The "instructions" for all the proteins and enzymes which build and control cell functioning, are coded for on the (g) on the chromosomes in the nucleus.

Endoplasmic reticulum (ER) is a system of folded membranes and hollow channels. ER is usually connected to either the nuclear membrane or the cell membrane. Very often, (h) are found associated with ER. The ER functions by transporting and storing proteins.

The ribosomes are very tiny organelles. They are found in groups in the cytoplasm or along the outer membranes of ER. They make (i) .

The Golgi Apparatus is a stack of closely packed folded membranes or sacs. The sacs have swollen ends which 'bud off' vesicles or (j) carrying substances formed in the Golgi apparatus.

The (k) is a double membraned organelle that produces energy for the cell during cellular respiration.

The (l) contains chlorophyll (a green pigment) and it functions to make food for the plant by the process of (m) . Light energy is used to convert water and carbon dioxide into starch; oxygen is a waste product. (n) may be stored in chloroplasts.

Vacuoles are fluid-filled sacs surrounded by a single membrane. In plant cells there is usually one large vacuole. It contains (o) which helps the plant cell stay firm and rigid. A wilted plant does not have enough watery cell sap in the vacuoles.

These are the components of a generalised plant cell. Some plant cells are specialised to perform functions such as food making. They will have lots more (p) . A cell that specialises in support will have a very thick (q) .

[17 marks]

Are animal cells more advanced than plant cells?

[3 marks]

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Part Two: Comparing the differences between an animal and a plant cell

Draw up a table in which you compare the differences between an animal and a plant cell.

[6 marks]

Part Three: Make a model of a plant cell or an animal cell

Using the information provided in your lesson notes, your own diagrams and any further information from other sources (e.g. textbooks), make a model of a plant cell or an animal cell.

For the model use plasticine or playdough* and mount the model on a flat piece of wood or cardboard. For the parts of the cell use any suitably shaped objects e.g. pasta pieces, painted polystyrene, plastic bottle tops, etc.

**Playdough can be made by mixing 250 ml flour, 125 ml salt, 10 ml cream of tartar; 10 ml vegetable oil and 250 ml boiling water. Stir until a soft dough forms and knead until smooth. Create different colours by adding food colouring or poster paint with the water before stirring. Divide the uncoloured dough into portions and create several different colours if necessary. Playdough can be stored in airtight container in the fridge. If allowed to stand in a cool, dry place playdough models can be dried. (The salt prevents the playdough from going mouldy.)*

Rubric to assess model of a cell

Criteria	Level 4 [4]	Level 3 [3]	Level 2 [2]	Level 1 [1]
Scientific correctness	Excellent, novel ideas, functional, innovative.	Novel ideas, model sound, accurate.	Mostly complete, some inaccuracies.	Model incomplete.
Size & scale	Perfect size/scale.	Good size/scale.	Too big/too small, as a whole or components.	Disproportionate.
Colour & contrast	Innovative use of colour.	Good use of colour.	Adequately addressed.	Dull, no effort to use colour.
Originality	Innovative and new.	Good ideas.	Nothing really new.	Boring/uses old ideas.
3D	3D fully conceptualised.	3D well conceptualised.	A mixture of 2D and 3D.	Some aspects in 3D but mostly

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				2D.
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[20 marks]

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Suggested Solutions

Question number	Possible marks	Solution								
1	17	a cellulose b plasmodesmata c cell membrane d cytoplasm e permeable f nucleus g genes h ribosomes i proteins j lysosomes k mitochondrion l chloroplast m photosynthesis n starch o cell sap p chloroplasts q cell wall								
	3	Animal cells are definitely not more highly developed than plant cells. ✓ And plant cells are not more highly developed than animal cells. ✓ Plant and animal cells have developed differently to function in different organisms in different ways, ✓ but the one is not more complex or more specialised than the other.								
2	6	<table border="1"> <thead> <tr> <th>Plant cell</th> <th>Animal cell</th> </tr> </thead> <tbody> <tr> <td>Thick cellulose cell wall and cell membrane.</td> <td>No cell wall, membrane only.</td> </tr> <tr> <td>Large cell sap vacuole.</td> <td>No large vacuole, small ones may be present.</td> </tr> <tr> <td>Chloroplasts present.</td> <td>Chloroplasts absent.</td> </tr> </tbody> </table>	Plant cell	Animal cell	Thick cellulose cell wall and cell membrane.	No cell wall, membrane only.	Large cell sap vacuole.	No large vacuole, small ones may be present.	Chloroplasts present.	Chloroplasts absent.
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3	20	See rubric in Appendix of Assessment Tools.								

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Appendix of Assessment Tools

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