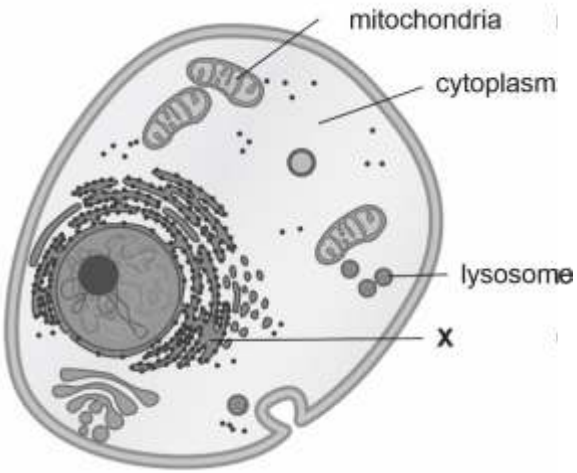
Curriculum Aligned Competency Based Test Items
Science
Class 9 – Chapter 5
Fundamental Unit of Life

The diagram shows an animal cell with some of its organelles. X is also a cell organelle.



SAS21S090501

1 What does X represent in the diagram?

A. Nucleus
B. Chromosomes
C. Golgi apparatus
D. Endoplasmic reticulum

SAS21S090502

2 The inner membrane of the mitochondria is folded into many finger-like projections. Explain what would happen if the inner membrane was not folded?

_____

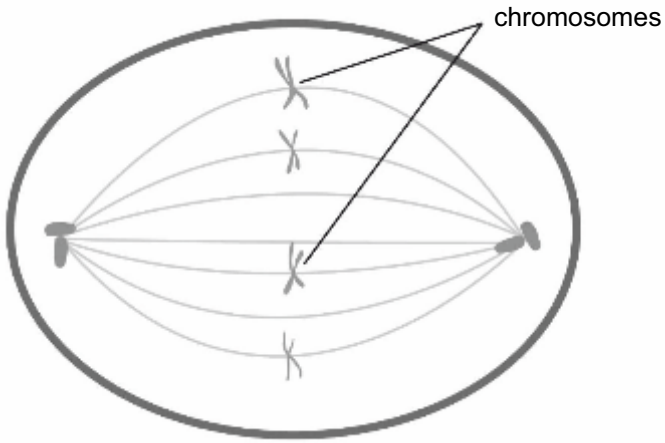
_____

SAS21S090503

3 Which cell organelles found only in a plant cell are **not** shown in the diagram?
Circle 'Yes' or 'No' for each row.

Features found only in a plant cell	Yes or No
Cell wall	Yes/No
Ribosomes	Yes/No
Chloroplast	Yes/No

Cells grow by dividing. The picture shows one such growing cell ready to divide.



SAS21S090504

4 How many cells will be formed after the cell divides completely?

_____

_____

SAS21S090505

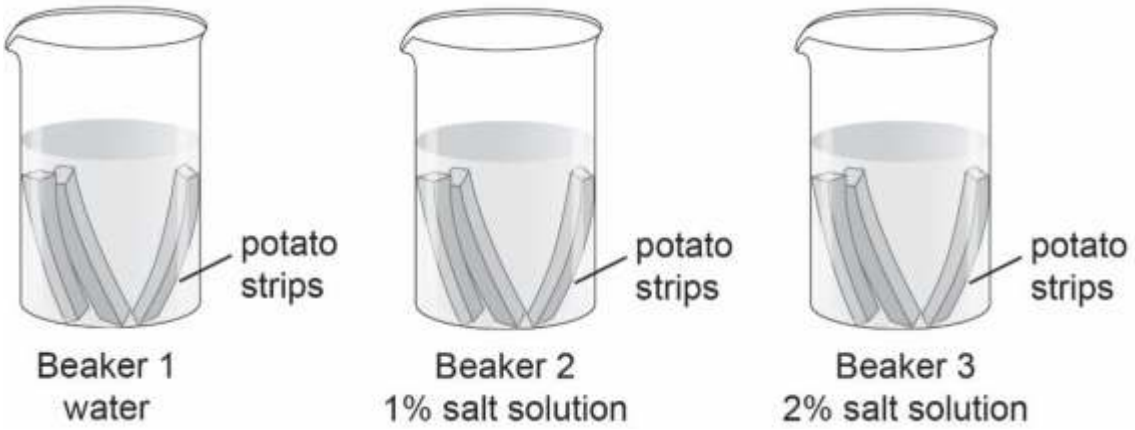
5 How many chromosomes will each daughter cell receive?

A. 2
B. 4
C. 8
D. 12

Sania conducts an experiment to know how plant cells lose or gain water through osmosis.
She cuts out 5 cm long potato strips. She puts three potato strips in each of the following beakers:

- Beaker 1 containing only water
- Beaker 2 containing 1% salt solution
- Beaker 3 containing 2% salt solution

Sania leaves the potato strips in the beaker for 5 hours.



She records the length of the potato strips in each beaker after 5 hours.

	Length of the potato strip before placing in the beaker (cm)	Length of the potato strip after 5 hours in the beaker (cm)
Beaker 1 water	5.0	5.3
	5.0	5.2
	5.0	5.2
Beaker 2 1% salt solution	5.0	5.0
	5.0	5.0
	5.0	4.9
Beaker 3 2% salt solution	5.0	4.8
	5.0	4.9
	5.0	4.7

SAS21S090506

6 What can Sania conclude from her experiment?

A. Salt molecules from the cell move out when kept in water.
B. Cells gain water through osmosis when kept in salt solution.
C. Cells in salt solution first gain water and then gradually lose water.
D. Water molecules move out of the cell based on the amount of salt in the solution.

SAS21S090507

7 In which beaker was the concentration of water molecules inside and outside the potato cells likely to be the same? Explain your answer.

_____

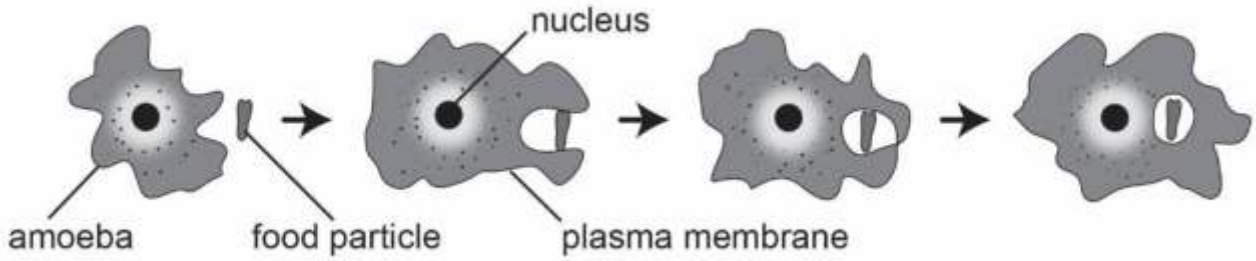
_____

SAS21S090508

8 Why did Sania place three potato strips in each beaker?

_____

_____



SAS21S090509

9 Which of these properties qualifies amoeba as eukaryotes?

A. It is unicellular.
B. It needs food for energy.
C. It has a membrane bound nucleus.
D. It is surrounded by a plasma membrane.

SAS21S090510

10 What property of the plasma membrane helps amoeba acquire food?

A. It is flexible.
B. It is selectively permeable.
C. It is made up of proteins and lipids.
D. It allows diffusion of some substances across it.

Answers

Item Number	Question 1
Question Code	SAS21S090501
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Living Organisms-Cell Organelles
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	D. Endoplasmic Reticulum
No Credit (No Score)	Any other response or missing response

Item Number	Question 2
Question Code	SAS21S090502
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Living Organisms-Cell Organelles
Competency	Explaining Phenomena Scientifically
Item Type	Constructed Response
Full Credit (Full Score)	Mentions that there will be less surface area so less ATP will be produced. For example: • Surface area will decrease so less energy will be produced.
No Credit (No Score)	Any other response or missing response

Item Number	Question 3
Question Code	SAS21S090503
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Living Organisms-Cell Organelles
Competency	Explaining Phenomena Scientifically
Item Type	Complex Multiple Choice Question
Full Credit (Full Score)	Yes No Yes
No Credit (No Score)	Any other response or missing response

Item Number	Question 4
Question Code	SAS21S090504
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Cell Division
Competency	Explaining Phenomena Scientifically
Item Type	Constructed Response
Full Credit (Full Score)	Mentions that two daughter cells will be formed. For example: • Two daughter cells
No Credit (No Score)	Any other response or missing response

Item Number	Question 5
Question Code	SAS21S090505
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Cell Division
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	B. 4
No Credit (No Score)	Any other response or missing response

Item Number	Question 6
Question Code	SAS21S090506
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Plasma Membrane
Competency	Interpreting Data & Evidence Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	D. Water molecules move out of the cell based on the amount of salt in the solution.
No Credit (No Score)	Any other response or missing response

Item Number	Question 7
Question Code	SAS21S090507
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Plasma Membrane
Competency	Interpreting Data & Evidence Scientifically
Item Type	Constructed Response
Full Credit (Full Score)	Mentions Beaker 2 (1% salt solution) with reference to the equal lengths of the potato strips before and after the experiment. For example: • The lengths of the potato strips are almost the same in Beaker 2. • There is hardly any change in the length of the strips in Beaker 2.
No Credit (No Score)	Any other response or missing response

Item Number	Question 8
Question Code	SAS21S090508
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Plasma Membrane
Competency	Evaluating & Designing Scientific Enquiry
Item Type	Constructed Response
Full Credit (Full Score)	Mentions that the results need to be verified by multiple trials. For example: • To reduce errors in measurement • To confirm the results of the experiment • To be sure about the readings
No Credit (No Score)	Any other response or missing response

Item Number	Question 9
Question Code	SAS21S090509
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Plasma Membrane
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	C. It has a membrane-bound nucleus.
No Credit (No Score)	Any other response or missing response

Item Number	Question 10
Question Code	SAS21S090510
Grade & Chapter Name	Grade 9 | Fundamental Unit of Life
Concept | Sub-concept	Life Science | Plasma Membrane
Competency	Explaining Phenomena Scientifically
Item Type	Multiple Choice Question
Full Credit (Full Score)	A. It is flexible.
No Credit (No Score)	Any other response or missing response