

APOLLO

Diversity of organisms

SL

Biology

First assessment 2025

6 questions | questions

8. The table shows features of three types of cells (X, Y and Z).

Feature	Cell		
	X	Y	Z
Cell wall	absent	present	present
Centrioles	present	absent	absent
Large vacuole	absent	present	present
Plastids	absent	present	absent

To which kingdom do each of the cells belong?

	X	Y	Z
A.	Animal	Fungi	Plant
B.	Fungi	Animal	Protist
C.	Animal	Plant	Fungi
D.	Protist	Animal	Plant

- 25.** The image shows *Prorocentrum*, a coastal dinoflagellate that obtains energy from sunlight and from other organisms.



What best describes the mode of nutrition of *Prorocentrum*?

- A. Mixotrophic
- B. Autotrophic
- C. Holozoic
- D. Heterotrophic

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

2. There can be much variation within a single species, such as dogs (*Canis familiaris*).



- (a) Define species.

[1]

.....

.....

- (b) Describe how karyotyping can be used to decide if all these dogs are of the same species or not.

[2]

.....

.....

.....

.....



13. The table shows the binomial naming of four species.

Organism	Genus	Species
W	<i>Felis</i>	<i>catus</i>
X	<i>Conus</i>	<i>catus</i>
Y	<i>Ameiurus</i>	<i>catus</i>
Z	<i>Felis</i>	<i>silvestris</i>

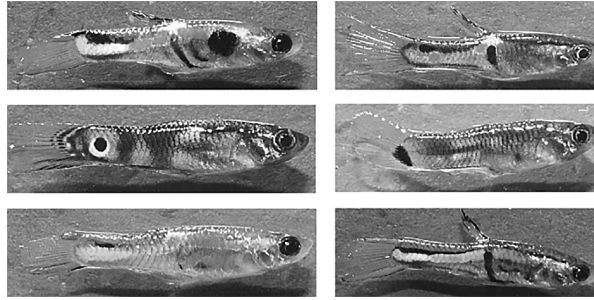
What can be concluded?

- A. W, X and Y are the most closely related.
- B. X and Y are the most closely related.
- C. W and Z are the most closely related.
- D. W is equally related to all the other species.

25. What describes holozoic nutrition?

	Nutrition type	Digestion
A.	chemoautotrophic	none
B.	photoautotrophic	none
C.	saprotrophic	external
D.	heterotrophic	internal

4. The images show examples of adult male guppies (*Poecilia reticulata*).



(a) State the name of the genus to which the guppy belongs.

[1]

.....

(b) Outline Linnaeus's morphological concept of species.

[1]

.....

(c) (i) Two alternative hypotheses were suggested:

- the guppies were from a single interbreeding population
- the guppies were not from a single interbreeding population.

Explain, with a reason, which hypothesis is stronger.

[1]

.....

(ii) Suggest how additional evidence could be used to further test which hypothesis is supported.

[2]

.....

(This question continues on the following page)



(Question 4 continued)

(d) Suggest an adaptive advantage for these guppies of having striking colour patterns. [1]

.....

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References:

1. Jamieson, J.D. and Palade, G.E., 1967. Intracellular transport of secretory proteins in the pancreatic exocrine cell. *Journal of Cell Biology*, 34, pp.597–615.
2. Houseman, J. and Ford, M., 2014. *Dicot leaf L*. [image online] Available at: <https://commons.wikimedia.org/wiki/File:Dicot_leaf_L.jpg> [Accessed 28 July 2020].
3. *Lemna minor*, 2015. [image online] Available at: <<https://www.semanticscholar.org/paper/Darwin-Wallace-Demons%3A-survival-of-the-fastest-in-Kutschera-Niklas/a2e3531fa8c1920d2bd4d04871bfeb19ed2143f0>> [Accessed 8 December 2020].
4. Jones, J.C., Gunter, H.M. and Meyer, A., 2008. Will he still look good with the lights on? Spectral tuning of visual pigments in fish. *Journal of Biology*, [e-journal] 7(26). Available at: <<https://jbiol.biomedcentral.com/articles/10.1186/jbiol86>> [Accessed 28 July 2020].



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