

2 What can be used to classify organisms?

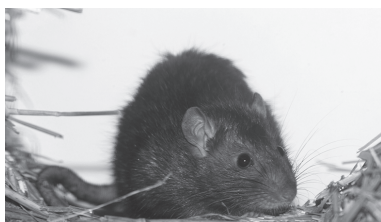
- A the number of bases in DNA
- B the number of different types of bases in DNA
- C the sequence of bases in DNA
- D the sequence of bases in one protein

1 The photographs show two different rats.

Rattus norvegicus



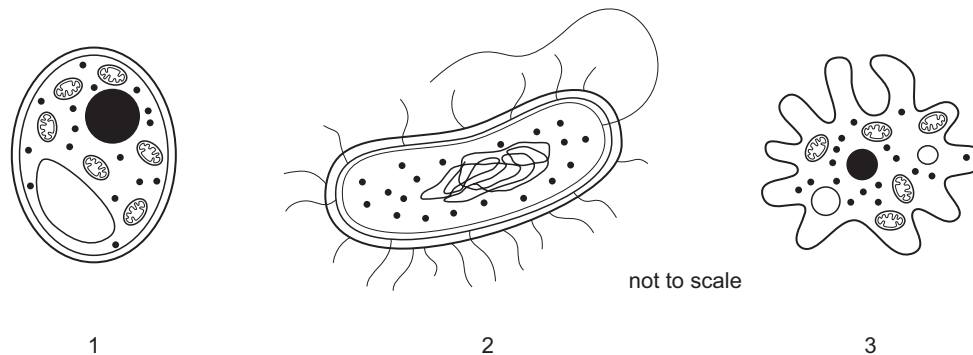
Rattus rattus



Which statement about the rats is correct?

- A The rats belong to the same genus.
- B The rats belong to the same species.
- C The rats can breed together to produce fertile offspring.
- D The rats do **not** share any of the same features.

2 The diagrams show cells of organisms from three different kingdoms.



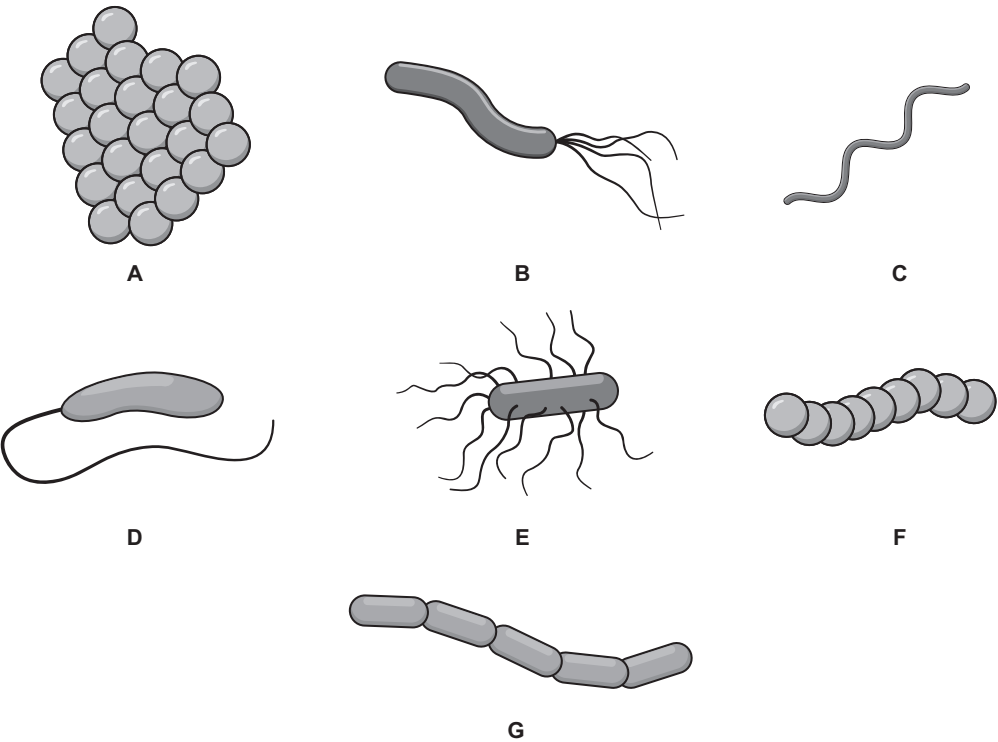
Which row shows the kingdoms for the organism cells labelled 1, 2 and 3?

	cell 1	cell 2	cell 3
A	fungus	protocist	prokaryote
B	fungus	prokaryote	protocist
C	prokaryote	fungus	protocist
D	prokaryote	protocist	fungus

2 What are the two parts of the scientific name of an organism?

- A genus followed by kingdom
- B genus followed by species
- C kingdom followed by genus
- D kingdom followed by species

1 (a) Fig. 1.1 shows drawings of seven species of bacteria.



not to scale

Fig. 1.1

Use the key to identify each species of bacteria in Fig. 1.1.

Write the letter of each species (A to G) in the correct box beside the key.

One has been done for you.

key

1	(a)	hair-like structure or structures visible	go to 2	
	(b)	no hair-like structures visible	go to 4	
2	(a)	more than one hair-like structure	go to 3	
	(b)	one hair-like structure only	<i>Vibrio cholerae</i>	
3	(a)	hair-like structures attached at one end only	<i>Helicobacter pylori</i>	
	(b)	hair-like structures attached all over	<i>Salmonella typhi</i>	
4	(a)	bacteria have a spiral shape	<i>Treponema pallidum</i>	
	(b)	bacteria do not have a spiral shape	go to 5	
5	(a)	bacteria are grouped to form a chain	go to 6	
	(b)	bacteria do not form a chain	<i>Staphylococcus aureus</i>	
6	(a)	bacteria in the chain are cylindrical in shape	<i>Streptobacillus moniliformis</i>	
	(b)	bacteria in the chain are circular in shape	<i>Streptococcus pyogenes</i>	F

[3]

(b) (i) A cylinder-shaped bacterium has a length of 2 μm and a diameter of 0.5 μm.

Calculate:

- the radius of this bacterium
- the volume of this bacterium.

Include the units in your answers.

Space for working.

radius

volume

[4]

(ii) State the name of the kingdom that bacteria belong to.

..... 4 [1]

(c) Fig. 1.2 is a diagram of a virus.

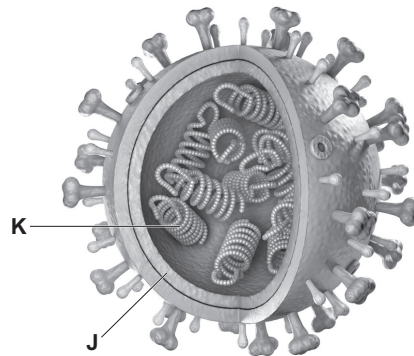


Fig. 1.2

(i) State the name of the parts labelled J and K in Fig. 1.2.

J

K

[2]

(ii) State **two** structures present in bacteria that are absent in viruses.

1

2

[2]

[Total:12]

1 Scientists use classification systems to study relationships between different groups of organisms.

(a) State the **two** parts of a scientific name used in the binomial system.

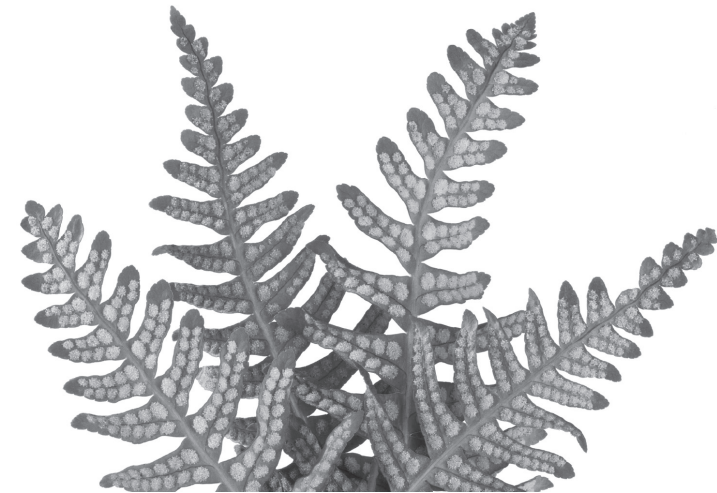
..... [1]

(b) Scientists discover a new species. It is multicellular, and has cell walls that are **not** made of cellulose. This new species feeds by releasing digestive enzymes into its surroundings and then absorbing the digested nutrients.

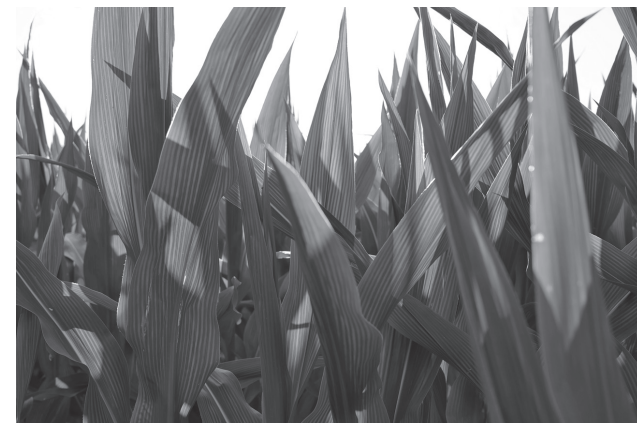
Identify the kingdom that the new species belongs to.

..... [1]

(c) Fig. 1.1 shows photographs of two different species, X and Y.



species X



species Y

(i) Species **X** and **Y** belong to the plant kingdom.

State **two** structures found in cells from species **X** and **Y** that are **not** found in animal cells.

1

2

[2]

(ii) Using features visible in Fig. 1.1, identify the group in the plant kingdom that species **X** and **Y** belong to.

Explain your answer.

species **X**

.....

.....

.....

species **Y**

.....

.....

.....

.....

[4]

(iii) Understanding evolutionary relationships between crop plants can help scientists and farmers improve agriculture.

Explain how a scientist could determine if different crop plant species share a recent ancestor (are closely related).

.....

.....

.....

.....

.....

[2]

[Total: 10]

2 Part of the base sequence of DNA from four species was determined.

species 1 T C A G G A T T

species 2 T G A G C A A T

species 3 T G A G C A A G

species 4 T G A G G A T T

Which two species are the **least** closely related?

A 1 and 2

B 1 and 3

C 2 and 4

D 3 and 4

- The point where the branch starts also indicates a common ancestor shared by the new groups.

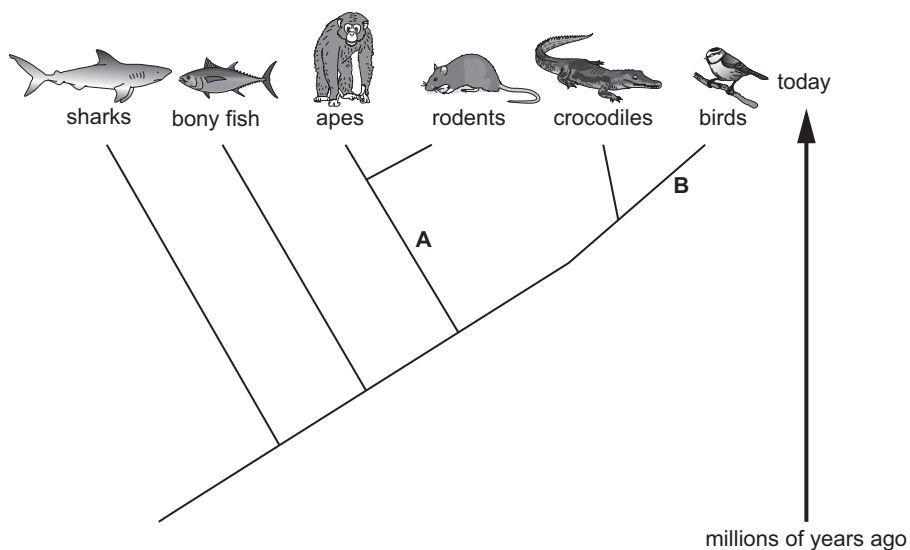


Fig. 5.1

- [2]

- [1]

- [2]

- [4]

- [3]

[Total: 12]

- A** P **B** Q **C** R **D** S