

Exercise walk-through

1.2

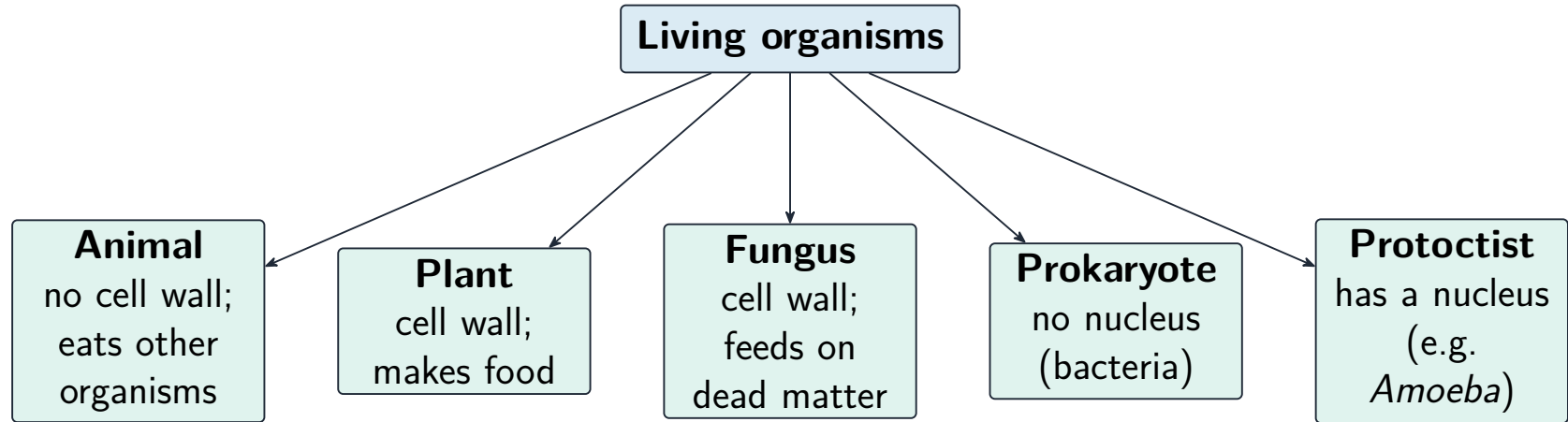
Concept and uses of classification systems

IGCSE Biology

The five kingdoms

- **Animal** – many cells, no cell wall, feed
- **Plant** – cell wall, **photosynthesise**
- **Fungus** – cell walls, feed on matter
- **Prokaryote** – bacteria, no **nucleus**
- **Protocist** – e.g. *Amoeba*

The five kingdoms, in detail



Living organisms are sorted into five kingdoms by their main features

The five kingdoms, with an example each

Animal

Many cells, no cell wall, feed on other organisms, and most can move about.

Plant

Many cells with a cell wall; many contain **chloroplasts** and make their own food by **photosynthesis**.

Fungus

Moulds, **mushrooms** and **yeast**: cell walls, cannot photosynthesise, feed on dead or living matter.

Protocist

Amoeba and the **algae**: usually **single-celled**, and the cells **do** have a nucleus.

Prokaryote

Bacteria: single-celled, and the cells have **no** nucleus.

Ask three questions in order: many cells or one? A nucleus or none? Makes its own food or takes it?

Vertebrates

mammals – fur /hair; feed young on milk

birds – feathers & a beak; hard-shelled eggs

reptiles – dry scales ; leathery eggs on land

amphibians – moist skin; eggs & young in water

fish – wet scales & **fins** ; breathe with **gills**

Vertebrates have a **backbone** .

Arthropods

insects – 3 body parts; 3 pairs of legs; **antennae**

arachnids – 2 body parts; 4 pairs of legs; no wings

crustaceans – many legs; 2 pairs of antennae; mostly aquatic

myriapods – many **segments**, legs on each

Arthropods have no backbone but a hard **exoskeleton**.

Exercises 2.1·2.2

2.1 Define a species.

[1]

2.2 In the name *Homo sapiens*, state which word is the genus.

[1]

Exercises 2.1·2.2

2.1 Define a species.

[1]

2.1

- a species is a group of organisms that can reproduce to make **fertile offspring**

2.2 In the name *Homo sapiens*, state which word is the genus.

[1]

2.2

- in *Homo sapiens* the genus is ***Homo***

Exercise 3.1

3.1 Two organisms with very similar DNA base sequences are:

[1]

☐

A distantly related

B closely related

C the same individual

D not related

Exercise 3.1

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[1]

☐

A distantly related

B closely related

C the same individual

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3.1 B

- similar DNA base sequences mean **closely related**
- A is the opposite; C is one individual; D is false

Exercise 3.2 (a)

3.2 A student writes a scientific name as “homo Sapiens”.

(a) State the two mistakes in this name.

[2]

Exercise 3.2 (a)

3.2 A student writes a scientific name as “homo Sapiens”.

(a) State the two mistakes in this name.

[2]

(a)

- the genus should have a **capital** (*Homo*)
- the species should be **lower-case** (*sapiens*)

Exercise 3.2 (b)

3.2 A student writes a scientific name as “homo Sapiens”.

(b) State one feature you should use when building a dichotomous key, and one you should avoid. [2]

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(b)

- use a **clear visible feature** (e.g. wings / no wings)
- avoid a feature that **changes**, such as size

Exercise 3.3

3.3 Explain how DNA base sequences can be used to find out how closely two species are related. [2]

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3.3

- compare the **base sequences** of the two species
- the more similar they are, the **more closely related**

Exercise 3.4 (a)

3.4 Five small animals were found in a pond.

Animal	Legs	Wings	Body
P	6	yes	three parts
Q	8	no	two parts
R	0	no	many segments
S	6	no	three parts
T	10	no	two parts

(a) Construct a dichotomous key that separates all five animals.

[4]

Exercise 3.4 (a)

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(a) Construct a dichotomous key that separates all five animals.

[4]

(a)

- a workable key, each step offering exactly two choices, e.g.

```
1 has legs → 2; has no legs → R
2 has 6 legs → 3; has more than 6 legs → 4
3 has wings → P; has no wings → S
4 has 8 legs → Q; has 10 legs → T
```

- two answers only; visible features; all five reached once

Exercise 3.4 (b)

3.4 Five small animals were found in a pond.

Animal	Legs	Wings	Body
P	6	yes	three parts
Q	8	no	two parts
R	0	no	many segments
S	6	no	three parts
T	10	no	two parts

(b) Animals **P** and **S** belong to the same class. Name that class and give **two** features from the table that place them in it. [3]

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(b) Animals **P** and **S** belong to the same class. Name that class and give **two** features from the table that place them in it. [3]

(b)

- **insects**
- both have **six legs** and a body in **three parts**

Exercise 3.4 (c)

3.4 Five small animals were found in a pond.

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(c) One of the animals is called *Daphnia pulex*. State what each part of the name tells you, and give **two** rules for writing a binomial name. [4]

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(c)

- *Daphnia* is the **genus**; *pulex* is the **species**
- genus capital, species small letter
- whole name in **italics**, or underlined by hand

Exercise 3.4 (d)

3.4 Five small animals were found in a pond.

Animal	Legs	Wings	Body
P	6	yes	three parts
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(d) Explain why scientists use scientific names instead of common names.

[2]

Exercise 3.4 (d)

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(d) Explain why scientists use scientific names instead of common names.

[2]

(d)

- a common name can mean different animals, or one animal can have many names
- a scientific name is the **same all over the world**