

Activity 4.9 Being Darwin

Purpose

- To consider the scientific classification of organisms
- To look in detail at naming organisms.

Organising organisms

Imagine trying to find your favourite brand of biscuit in a supermarket where they just randomly put all the items on the shelves. Most supermarkets are pretty well organised; items are arranged in groups with common features – biscuits, beverages, confectionary, toiletries, ready meals, etc. You can quickly find the ginger snaps! Biologists faced with the huge number of organisms that have so far been described also need to organise them in a logical way. In the same way that all the different brands of decaffeinated coffee might be shelved together, within the coffee section, which is within the hot drinks section that can be found in the drinks aisle, organisms are placed into a hierarchy of groups called taxa (singular taxon). Members of a taxon share common features.

In this activity you consider the taxonomic hierarchy developed by Whittaker in 1959 and modified by Margulis and Schwartz in 1982 and try putting some of the organisms that Darwin found in the Galapagos Islands into their appropriate taxonomic groups. Read pages 159–161 of the AS textbook before continuing with this sheet.

Q1 What are the names of the five kingdoms?

Q2 What are the other groupings found in the hierarchy?

Use your biological knowledge to assign each of two key feature cards provided to the correct kingdom. Cut out the cards, if this has not been done already. Lay out the kingdom cards as column headings. Then place the key features cards in the appropriate columns. Note that some features are shared by more than one kingdom so there are some cards with the same features. Then complete the questions below using the description of the five kingdoms in the columns or in Figure 1 on page 2 of this activity. These summarise the common features of the organisms in the five kingdoms and some animal phyla and classes. Note that the diagram does not show all of the phyla, nor all of the classes.

Q3 Colour all the phyla on the sheet one colour and all the classes another colour.

Q4 What do all the classes in the phylum Chordata have in common?

Q5 What do spiders, centipedes and insects have in common?

Q6 If you have time, look at the organisms shown in the virtual tour of the Galapagos islands in the Interactive tutorial that accompanies this activity (or the ones provided by your teacher/lecturer) and see if you can assign them to one of the five kingdoms and, where appropriate, to the correct phylum and class.

For a long time the five kingdoms were considered to be the top level in the taxonomic hierarchy, this is no longer the case. Read page 161–163 of the AS textbook and then answer the questions below.

Q7 a Who proposed a new system of classification?

b What are the main groups that make up the top level of this classification?

c What feature is used to assign organisms to these groups?

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Student

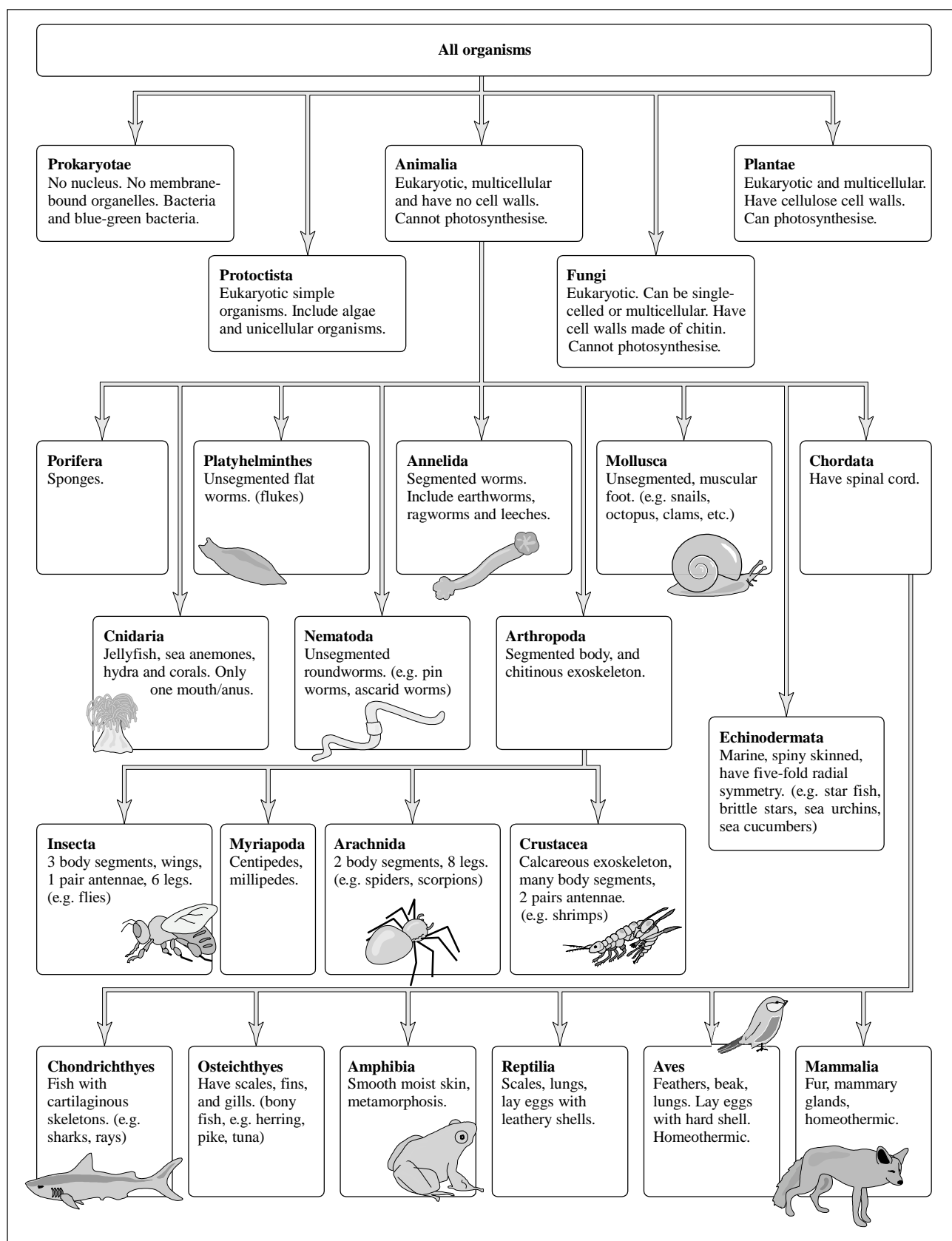


Figure 1 Taxonomic groups using the five kingdoms classification Margulis and Schwartz. All kingdoms and animal phyla are shown but only some other taxa.

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Naming organisms

The taxonomic classification of humans and tigers is shown in Table 1.

Table 1

	Human	Tiger
Kingdom	Animalia	Animalia
Phylum	Chordata	Chordata
Class	Mammalia	Mammalia
Order	Primata	Carnivora
Family	Hominidae	Felidae
Genus	<i>Homo</i>	<i>Felis</i>
Species	<i>H. sapiens</i>	<i>F. tigris</i>

Frequently one species will have many different common names, so when biologists, be they research scientists or keen gardeners, want to refer to a particular species they use the scientific name to avoid confusion. The scientific name for humans is *Homo sapiens* and that of tigers is *Felis tigris*. The first part of the name, the genus, is shared by all closely related species. The second part of the name is the particular species in the genus. They are written in italics or underlined to identify them as scientific names. The first time a scientific name is used it is given in full, after that it can be shortened, thus tiger would be *F. tigris*.

The scientific names for some common wild flowers are shown in Table 2.

Table 2

Common name	Scientific name
red clover	<i>Trifolium pratense</i>
creeping buttercup	<i>Ranunculus repens</i>
herb robert	<i>Geranium robertianum</i>
Cut-leaved cranesbill	<i>Geranium dissectum</i>
Meadow thistle	<i>Cirsium dissectum</i>

- Q8** Look at the list of scientific names. In addition to writing the name in italics, what other common convention is used?
- Q9** What genus does red clover belong to?
- Q10** What is the species name for creeping buttercup?
- Q11** Which two plants are most closely related: meadow thistle and cut-leaved cranesbill, or herb robert and cut-leaved cranesbill? Explain your answer.