1 Classification

Overview

In this chapter, you will review the main characteristics of different organisms and identify different groups of organisms using their features. You should also be able to identify the key features of a living organism in a living thing.

Practical investigation 1.1 Drawing and labelling organisms

Objective

The aim is to collect samples of different organisms to draw and label in the classroom. You should consider the key characteristics of life (using the acronym MRSGREN) to confirm whether your chosen specimen is a living organism or not. You should also begin to develop the required skills to draw and label what you can see accurately.

Equipment

- Small tray or box
- Latex gloves
- Insect pooter (optional)
- Sharp pencil
- Forceps/tweezers (or small shovel)

Method

1. You will need to gather the equipment provided by your teacher (this may or may not include an insect pooter).
2. Using the time and area allocated, search the area for organisms that can be collected in your tray. You should use gloves and forceps to protect your hands.
3. Collect at least three items that you consider to be organisms and place them in the tray or collect them by using the insect pooter.
4. Take your samples back to the classroom for drawing and observation.
5. Make large drawings of three of your samples in the boxes in the 'Recording data' section. Use the table in 'Analysis' to help guide your drawings. Label as many obvious or distinguishing features as you can see.
6. Once you have finished, you should safely dispose of any organisms that you collected. Your teacher will advise you on the disposal method. All live animals should be returned to the habitat where you found them.

Safety considerations

- Wear gloves and use forceps/tweezers when handling organisms.
- Wash your hands afterwards.
- Your teacher will give you any further safety instructions that are relevant to your local environment, such as dangerous insects or plants that can harm you.

Recording data

1 Make large labelled drawings of three samples and complete the information next to each box.

Name of organism .....

Location found .....

Observable signs that the sample is a living organism

.....

.....

Handling data

2 For any one of your drawings, use a ruler to measure the length of the actual organism and the length of your drawing of that organism. Use this information to calculate the magnification of your drawing.

Magnification: .....

Analysis

3 You should select one of your drawings for the analysis of your drawing skills. Complete the table to check the quality of your drawing. Then, swap with one of your classmates and allow them to mark your efforts.

Drawing skill	Self-graded	Graded by a classmate
Used a sharp pencil		
Drawn smooth, single lines		
The specimen is the right shape and proportion		
The drawing is larger than the actual specimen		
All observable features are drawn		
Labelled lines are neat and drawn with a ruler, touching the feature		
You have not used shading or colours in your diagram		
Total marks (out of 7)		

Evaluation

4 Look at the table in the 'Analysis' section. Do you have full marks from yourself and your peer? If not, identify the areas where you could improve and write them in the space below. You will need to refer to this next time you make a biological drawing of a specimen.

- .....
- .....
- .....
- .....

5 Complete the following table with the missing characteristics of life, then show which of the characteristics, if any, were evident in your collected specimens.

Characteristics of life	Specimen	Evidence that I could see
movement		
respiration		
growth		
excretion		
nutrition		

Practical investigation 1.2 Observation and drawing of pollen tubes

Objective

The aim of this investigation is to dissect a flower, make a detailed drawing of the inside of the flower, label the features, and identify the different sections within the flower. This builds upon the drawing skills developed in Practical investigation 1.1 and link to knowledge of the plant group that your flower falls into (such as angiosperm/monocot/dicot).

Equipment

- Scalpel
- Dissection tray or board
- Different types of flower

Method

1. Set up the dissection area on your workbench.
2. Carefully cut your flower into half to create a cross-section of the inside of the flower. You are aiming to observe the pollen tubes.
3. Repeat this to allow each member of the group to have their cross-section of the flower for drawing.
4. Make a large, detailed drawing of your cross-section of the flower.

Safety considerations

Take care when using the scalpel. Clear stains using paper towels if they spill onto the workbench.

Recording data

Make your large, detailed drawing in the box below and label the parts that you know.

Name of flower .....

Class of the flower .....

Analysis

1 In the previous investigation, you assessed your biological drawing using the criteria in the table. This time, you should list the criteria below that your diagram meets from that list.

- .....
- .....
- .....
- .....
- .....
- .....
- .....

Evaluation

2 Now, refer back to the list and write down the criteria, if any, that you did not meet in your flower drawing.

- .....
- .....
- .....

3 What class of plant does your flower belong to?

.....

Exam-style question

1 The yellow-fever mosquito (*Aedes aegypti*) is found in many tropical regions around the world and is identifiable by white markings on its legs. (Figure 1.1)

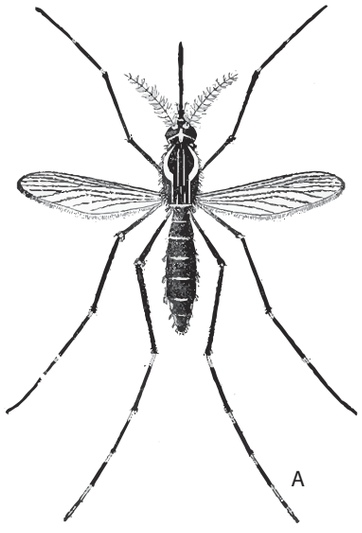

Figure 1.1

a Make a large drawing of the mosquito in the space below. [5]

b What is the actual size of the leg marked 'A' on the mosquito? [1]

.....

c What is the size of the same leg in your own drawing? [1]

.....

d Use your previous answers to calculate the magnification of your drawing. [3]

.....

e Which genus does the yellow-fever mosquito belong to? [1]

.....

f Which group of organisms does the yellow-fever mosquito belong to? [1]

.....

Total [12]