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Cambridge IGCSE™ Biology

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Lam Peng Kwan
Eric Lam Y K

THEORY WORKBOOK

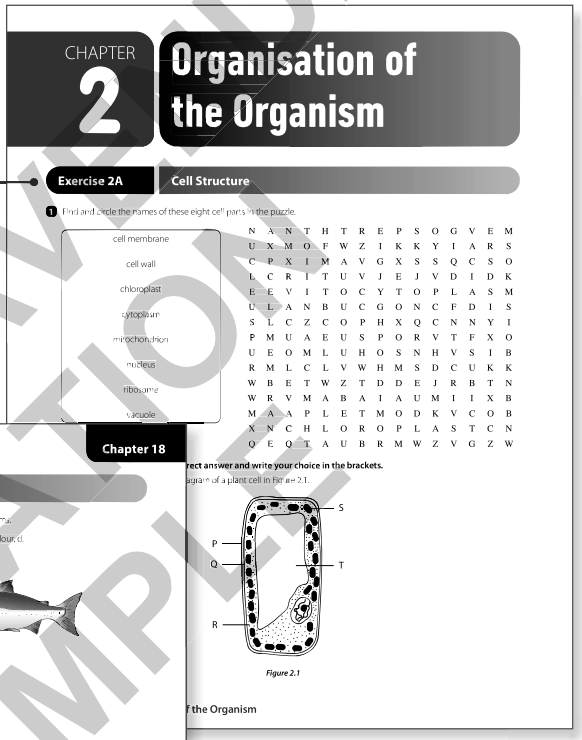
How to Use This Book

For further learner support, alongside the Student's Book, the Theory Workbook offers a range of exercises to reinforce and consolidate key terms and concepts learnt from each chapter.

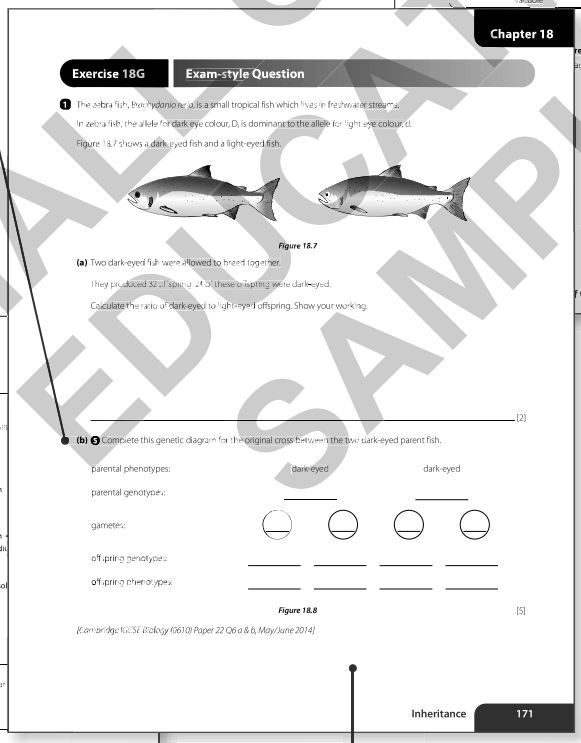
This Theory Workbook is part of the Marshall Cavendish Education suite of resources that will support you as you follow the Cambridge IGCSE™ and IGCSE (9–1) Biology syllabuses (0610/0970) and prepare for your examinations.

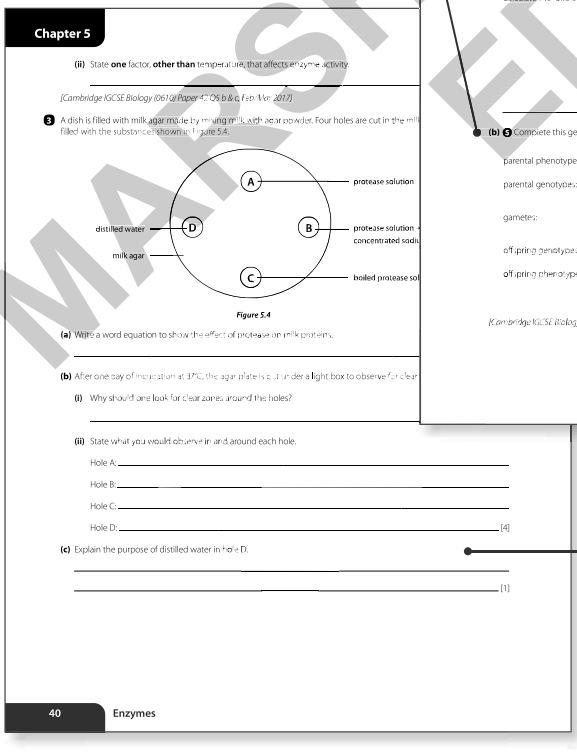
Formative Exercises
These exercises are meant to evaluate how well you are learning each section in a chapter.

The questions in the exercises are set using a variety of formats, which include word searches, crosswords, fill-in-the-blanks, completing sentences, matching and labelling. They are intended to help build your subject literacy and boost your confidence in using English to understand and respond to science questions. For example, word searches can help to increase your familiarity with key words, and reinforce and improve spelling of those words.


CHAPTER 2
Organisation of the Organism
Exercise 2A Cell Structure
1 Find and circle the names of these eight cell parts in the puzzle.
cell membrane
cell wall
chloroplast
cytoplasm
mitochondrion
nucleus
ribosome
vacuole
N A N T H T R E P S O G V E M
U X M O F W Z I K K Y I A R S
C P X I M A V G X S S Q C S O
L C R I T U V J E J V D I D K
E E V I T O C Y T O P L A S M
U L A N B U C G O N C F D I S
S L C Z C O P H X Q C N N Y I
P M U A E U S P O R V T F X O
U E O M L U H O S N H V S I B
R M L C L V W H M S D C U K K
W B E T W Z T D D E J R B T N
W R V M A B A I A U M I I X B
M A A P L E T M O D K V C O B
X N C H L O R O P L A S T C N
Q E Q T A U B R M W Z V G Z W
rect answer and write your choice in the brackets.
agram of a plant cell in Figure 2.1.
P
Q
R
S
T
Figure 2.1
f the Organism

S
Supplement content is clearly marked for those studying the extended syllabus.

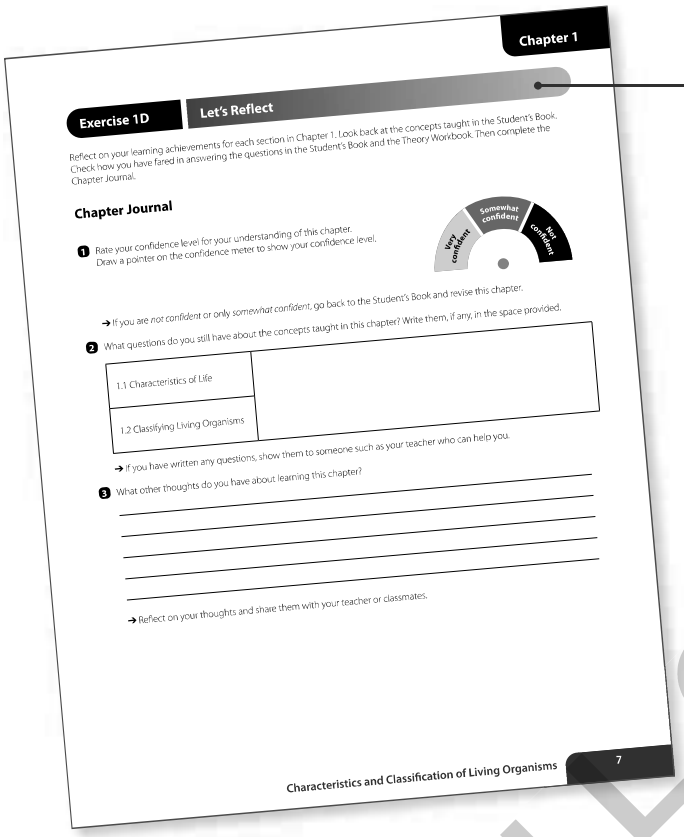

Chapter 18
Exercise 18G Exam-style Question
1 The zebra fish, *Brachydanio rerio*, is a small tropical fish which lives in freshwater streams.
In zebra fish, the allele for dark eye colour, D, is dominant to the allele for light eye colour, d.
Figure 18.7 shows a dark-eyed fish and a light-eyed fish.
Figure 18.7
(a) Two dark-eyed fish were allowed to breed together.
They produced 32 offspring. 24 of these offspring were dark-eyed.
Calculate the ratio of dark-eyed to light-eyed offspring. Show your working.
[2]
(b) S Complete this genetic diagram for the original cross between the two dark-eyed parent fish.
parental phenotypes: dark-eyed dark-eyed
parental genotypes:
gametes:
offspring genotypes:
offspring phenotypes:
Figure 18.8
[5]
[Cambridge IGCSE Biology (0610) Paper 22 Q6 a & b, May/June 2014]
Inheritance 171


Chapter 5
(ii) State **one** factor, **other than** temperature, that affects enzyme activity.
[Cambridge IGCSE Biology (0610) Paper 42 Q6 b & c, Feb/Mar 2017]
3 A dish is filled with milk agar made by mixing milk with agar powder. Four holes are cut in the milk agar and filled with the substances shown in Figure 5.4.
A
B
C
D
protease solution
protease solution + concentrated sodium
boiled protease sol
distilled water
milk agar
Figure 5.4
(a) Write a word equation to show the effect of protease on milk proteins.
(b) After one day of incubation at 37°C, the agar plate is put under a light box to observe for clear
(i) Why should one look for clear zones around the holes?
(ii) State what you would observe in and around each hole.
Hole A:
Hole B:
Hole C:
Hole D: [4]
(c) Explain the purpose of distilled water in hole D.
[1]
40 Enzymes

Exam-style Questions
Each chapter includes an exercise consisting of exam-style questions that are written by the author and/or taken from Cambridge IGCSE Biology past papers.

The questions serve as a summative assessment to evaluate what you have learnt. They also help you to become familiar with the types of the questions you will encounter in your exams.

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Chapter 1

Exercise 1D Let's Reflect

Reflect on your learning achievements for each section in Chapter 1. Look back at the concepts taught in the Student's Book. Check how you have fared in answering the questions in the Student's Book and the Theory Workbook. Then complete the Chapter Journal.

Chapter Journal

1 Rate your confidence level for your understanding of this chapter.
Draw a pointer on the confidence meter to show your confidence level.

Very confident | Somewhat confident | Not confident

→ If you are *not confident* or only *somewhat confident*, go back to the Student's Book and revise this chapter.

2 What questions do you still have about the concepts taught in this chapter? Write them, if any, in the space provided.

1.1 Characteristics of Life	
1.2 Classifying Living Organisms	

→ If you have written any questions, show them to someone such as your teacher who can help you.

3 What other thoughts do you have about learning this chapter?

→ Reflect on your thoughts and share them with your teacher or classmates.

Characteristics and Classification of Living Organisms 7

Let's Reflect

This exercise is included at the end of each chapter to help you identify knowledge gaps. It is designed for you to pause and reflect on your learning experience by evaluating your understanding of the concepts taught and completing the **Chapter Journal**.

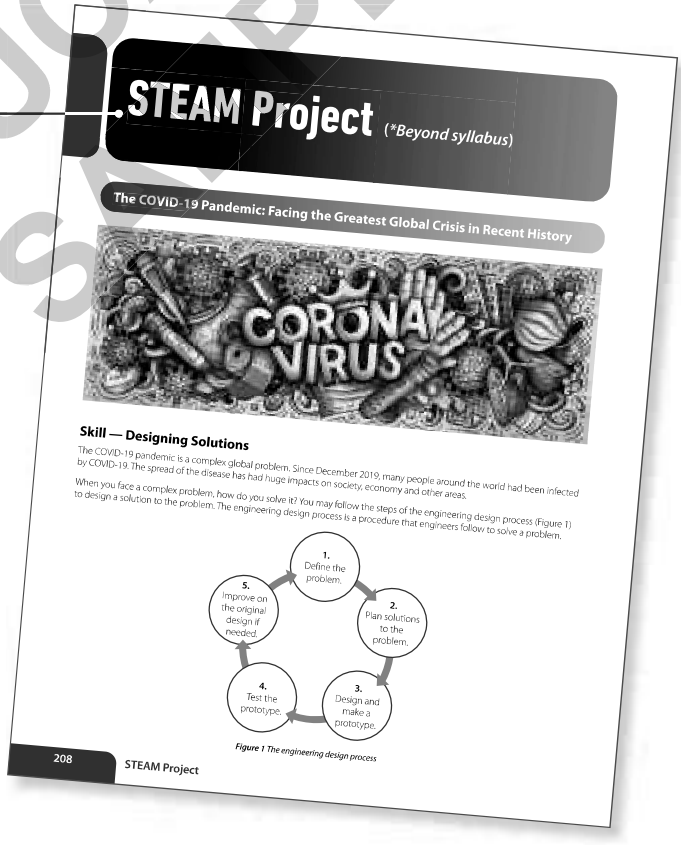
The use of a **confidence meter** to rate your level of confidence is a simple tool for you to recognise your level of understanding of a chapter.

To make your self-reflection visible to yourself and others, you can pose new questions about the key areas of the chapter where you are still unsure. You are also encouraged to write down your personal thoughts about the chapter.

From what you have reflected, you can then address any areas that require a follow-up. For example, you may revise the chapter on your own or ask your teacher to further explain a concept or correct a misconception.

Quotable quote on the importance of reflection:

"We do not learn from experience... we learn from reflecting on experience." – John Dewey



STEAM Project (*Beyond syllabus)

The COVID-19 Pandemic: Facing the Greatest Global Crisis in Recent History

***Skill* — Designing Solutions**

The COVID-19 pandemic is a complex global problem. Since December 2019, many people around the world had been infected by COVID-19. The spread of the disease has had huge impacts on society, economy and other areas.

When you face a complex problem, how do you solve it? You may follow the steps of the engineering design process (Figure 1) to design a solution to the problem. The engineering design process is a procedure that engineers follow to solve a problem.

Figure 1 The engineering design process

208 STEAM Project

STEAM Project *(*beyond the syllabus requirements)*

At the end of the Theory Workbook, there is a STEAM project for you and your classmates to undertake. STEAM stands for **S**cience, **T**echnology, **E**ngineering, the **A**rts and **M**athematics. This project allows you to work on a real-world problem by applying concepts across different areas that are interrelated. It helps to reinforce 21st century skills such as critical thinking, collaboration, communication, problem-solving and creativity. The STEAM project also provides an opportunity to develop you as a confident, responsible, reflective, innovative and engaged learner. Find out more about these attributes of a Cambridge Learner in the syllabus.

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CHAPTER

1 Characteristics and Classification of Living Organisms

Exercise 1A Characteristics of Life

For questions 1 and 2, choose the correct answer and write your choice in the brackets.

1 Which of these is **not** a characteristic of life?

A Can grow

B Can respond to changes in the environment

C Need food

D Need light ( )

2 Sam set up an experiment by placing some earthworms in a tray, as shown in Figure 1.1. After a few hours, he found that the earthworms moved to the covered part of the tray.

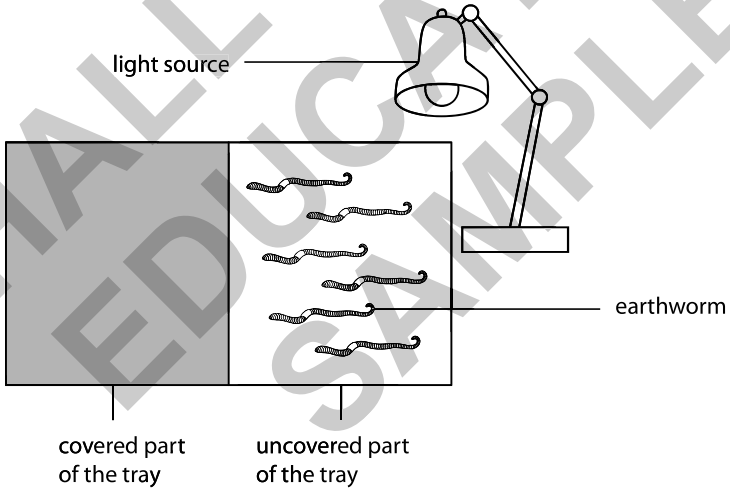


Figure 1.1

Which characteristic of living organisms do the earthworms show?

A Feeding

B Growth

C Reproduction

D Sensitivity ( )

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3 Draw lines to match each characteristic of living organisms to its description.

Characteristic	Description
(a) Movement	The ability to detect and respond to changes in the external or internal environment
(b) Reproduction	The permanent increase in dry mass and size
(c) Sensitivity	An action by an organism, causing it to change its position or place
(d) Growth	The removal of metabolic waste products and substances in excess of the body's requirements
(e) Respiration	The taking in of materials for energy, growth and development
(f) Excretion	The process that makes more of the same kind of organism
(g) Nutrition	The breakdown of nutrient molecules in cells to release energy for metabolism

Exercise 1B Classifying Living Organisms

For questions 1 to 3, choose the correct answer and write your choice in the brackets.

1 An animal has an exoskeleton, a segmented body and many pairs of legs.

In which group should this animal be classified?

A Arachnids
B Crustaceans
C Insects
D Myriapods ( )

2 A horse and a donkey belong to different species. They can breed to produce a mule. Mules are sterile (unable to produce young).

Which of these statements is correct?

A Donkeys and mules belong to the same species.
B Horses and mules belong to the same species.
C Mules are a species.
D Mules are not a species. ( )

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3 One type of giraffe has the scientific name *Giraffa camelopardalis*. Which group does each name refer to?

	Giraffa	***camelopardalis***
A	Family	Genus
B	Genus	Species
C	Order	Species
D	Species	Genus

( )

4 Figure 1.2 shows five different arthropods, A, B, C, D and E.

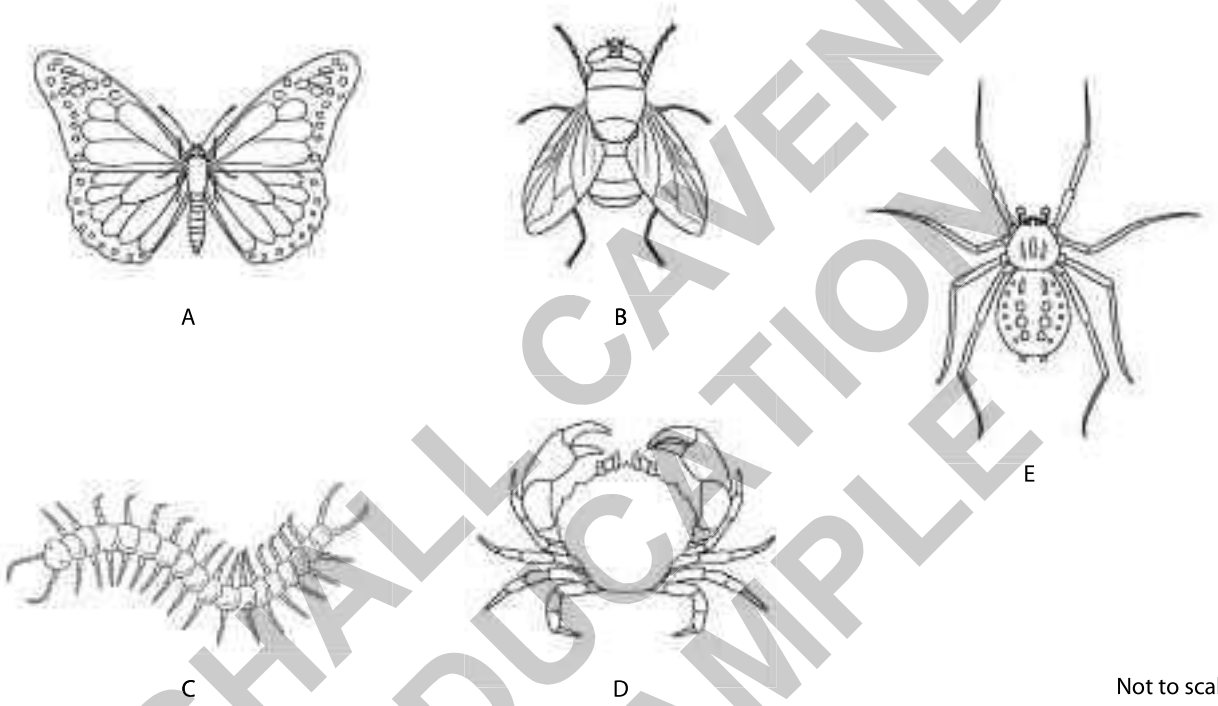


Figure 1.2

(a) State **two** features that all arthropods share.

1. _____

2. _____

(b) State the letter of the organism that is a myriapod. Give a reason for your answer.

Organism: _____

Reason: _____

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(c) Complete Table 1.1 by stating **two** differences between organisms A and E.

Table 1.1

	Organism A	Organism E
Difference 1		
Difference 2		

5 Figure 1.3 shows the main groups of vertebrates.

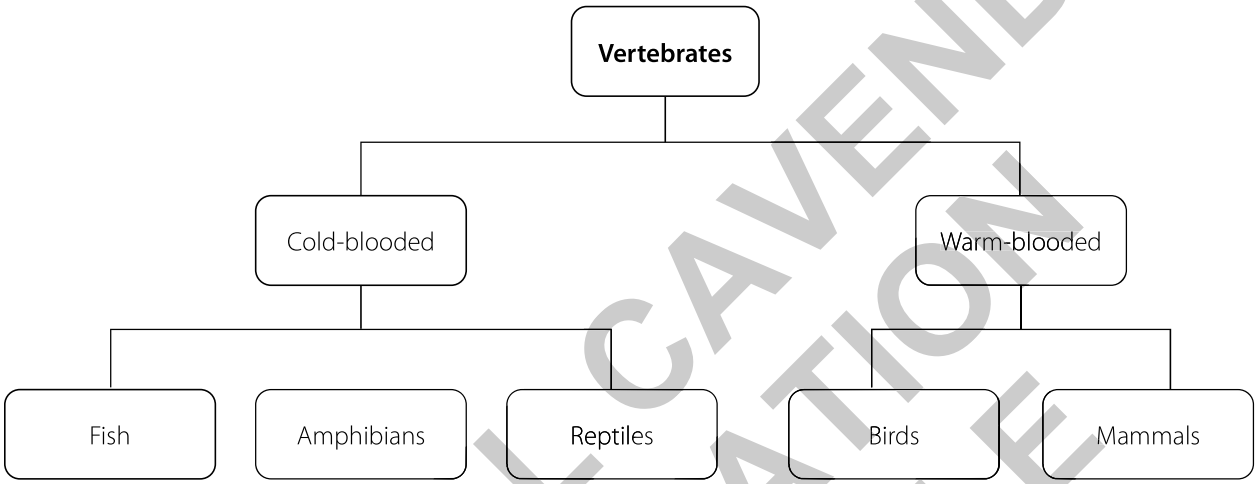


Figure 1.3

(a) Explain what is meant by *cold-blooded vertebrates*.

(b) State **one** feature of amphibians that differentiates them from fish.

(c) State **two** ways in which mammals are different from birds.

1.

2.

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Exercise 1C — Exam-style Questions

1 Figure 1.4 shows a diagram of an arthropod.

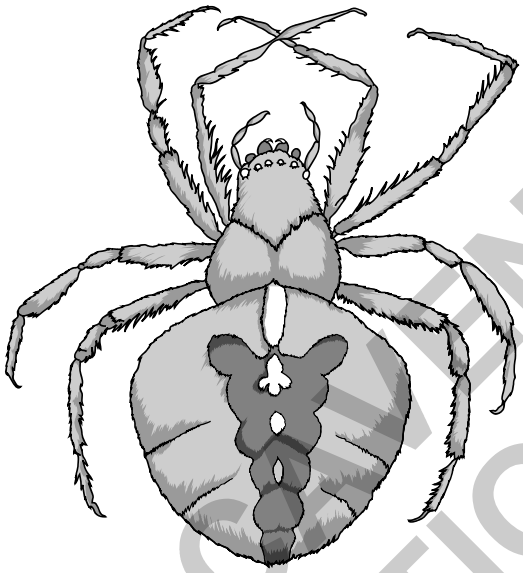


Figure 1.4

(a) (i) Name the arthropod group this animal belongs to.

_____ [1]

(ii) Give **two** reasons for your answer.

1. _____

_____

2. _____

_____

[2]

(b) State the names of **two** other arthropod groups.

1. _____

2. _____

[2]

[Cambridge IGCSE Biology (0610) Paper 32 Q1 a & b, Oct/Nov 2016]

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2 Figure 1.5 shows four arthropods.

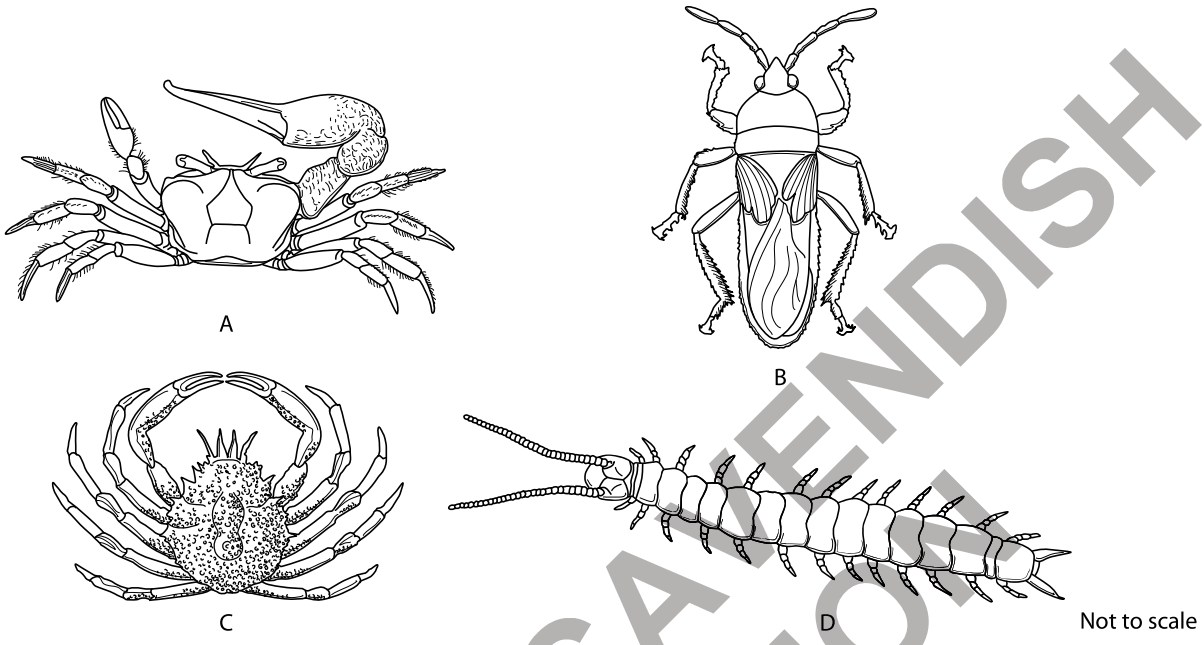


Figure 1.5

(a) State **two** features, visible in Figure 1.5, that are common to all arthropods.

1. _____

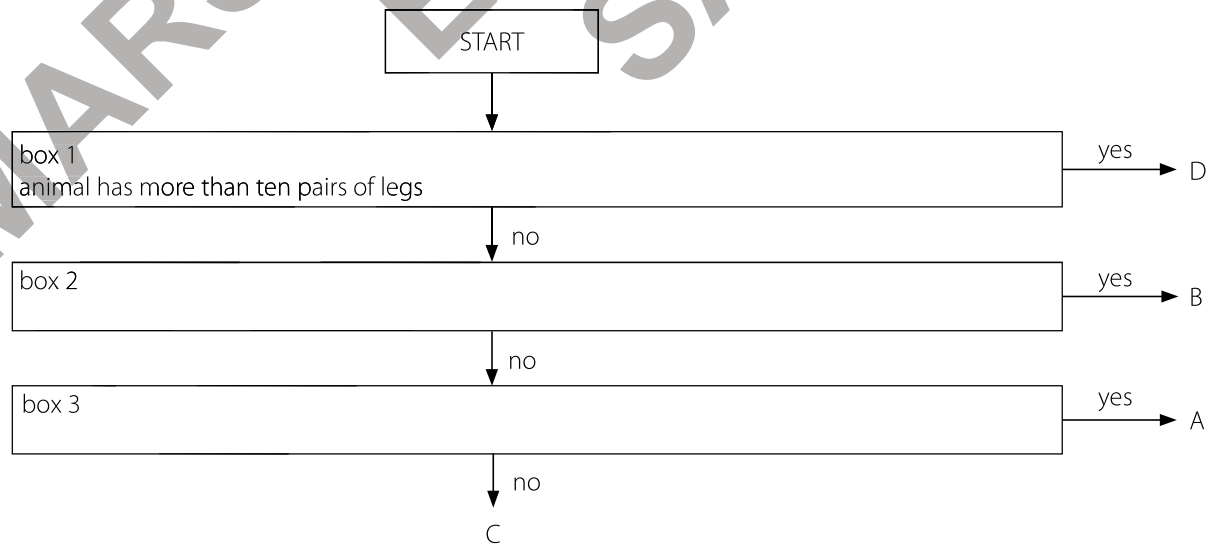
2. _____

[2]

(b) Figure 1.6 is a dichotomous key for the arthropods shown in Figure 1.5.

Complete Figure 1.6 by writing suitable statements in:

- box 2 to identify species B
- box 3 to separate species C and A.



[2]

Figure 1.6

[Cambridge IGCSE Biology (0610) Paper 42 Q1 a i & ii, Oct/Nov 2019]

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Exercise 1D Let's Reflect

Reflect on your learning achievements for each section in Chapter 1. Look back at the concepts taught in the Student's Book. Check how you have fared in answering the questions in the Student's Book and the Theory Workbook. Then complete the Chapter Journal.

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➔ If you are *not confident* or only *somewhat confident*, go back to the Student's Book and revise this chapter.

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1.2 Classifying Living Organisms	

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For over 60 years Marshall Cavendish Education has been empowering educators and students in over 80 countries with high-quality, research-based, Pre-K-12 educational solutions. We nurture world-ready global citizens by equipping students with crucial 21st century skills through our resources for schools and education centres worldwide, including Cambridge schools, catering to national and international curricula.

The *Marshall Cavendish Education Cambridge IGCSE™ Biology* series is designed for students preparing for the 0610/0970 syllabuses. The series translates insights from educational psychology classic "How People Learn" into highly effective learner-centred classroom practices.

TWB The **Theory Workbook** provides meaningful reinforcement of concepts covered in the Student's Book. Each chapter contains formative questions to assess topical understanding, exam-style questions to build exam readiness and a Chapter Journal to encourage self-reflection. The formative questions include multiple-choice questions, word jumbles, crosswords, and short-answer and structured questions — all of which are intended to foster subject literacy. A STEAM project offers the opportunity for group work, to encourage critical thinking and inquiry-based knowledge building.

This resource is endorsed by Cambridge Assessment International Education

- ✓ Provides learner support for the Cambridge IGCSE and IGCSE (9–1) Biology syllabuses (0610/0970) for examination from 2023
- ✓ Has passed Cambridge International's rigorous quality-assurance process
- ✓ Developed by subject experts
- ✓ For Cambridge schools worldwide

Series architecture

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- Theory Workbook
- Practical Workbook
- Teacher's Guide
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ISBN 978-981-4927-92-5



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