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Cambridge Lower Secondary Science

WORKBOOK 7

Mary Jones, Diane Fellowes-Freeman & Michael Smyth

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CAMBRIDGE
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Cambridge Lower Secondary

Science

WORKBOOK 7

Mary Jones, Diane Fellowes-Freeman & Michael Smyth

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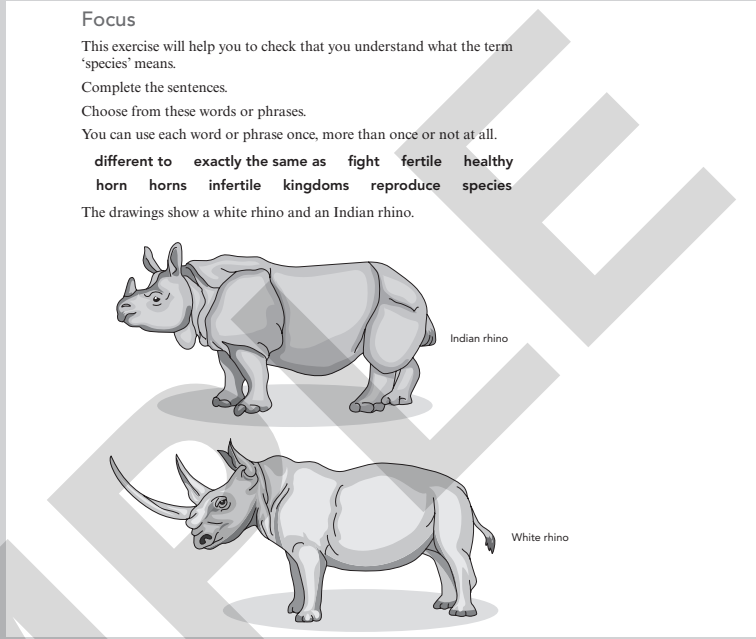
How to use this book

This workbook provides questions for you to practise what you have learned in class. There is a topic to match each topic in your Learner's Book. Each topic contains the following sections:

Focus: these questions help you to master the basics



Focus

This exercise will help you to check that you understand what the term 'species' means.

Complete the sentences.

Choose from these words or phrases.

You can use each word or phrase once, more than once or not at all.

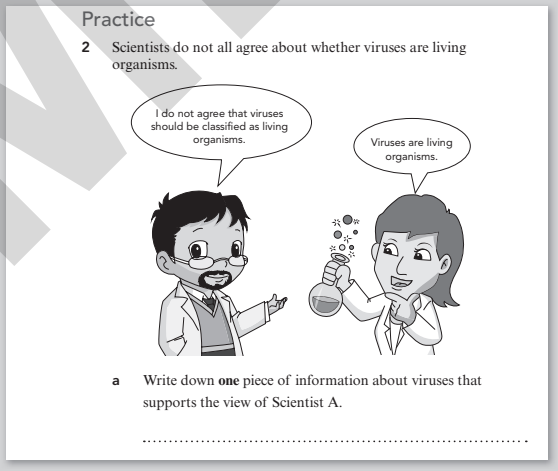
different to **exactly the same as** **fight** **fertile** **healthy** **horn** **horns** **infertile** **kingdoms** **reproduce** **species**

The drawings show a white rhino and an Indian rhino.

Indian rhino

White rhino

Practice: these questions help you to become more confident in using what you have learned



Practice

2 Scientists do not all agree about whether viruses are living organisms.

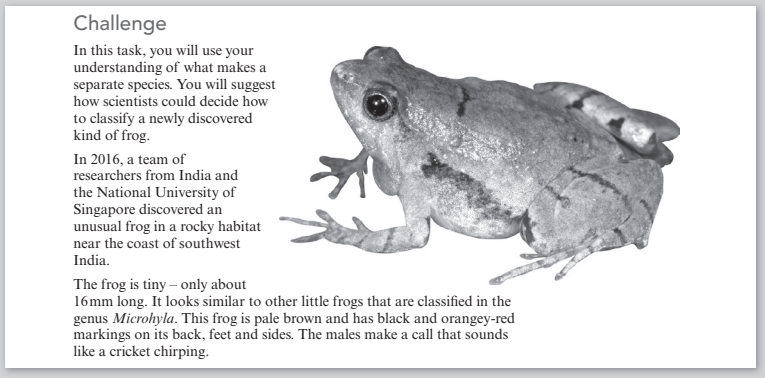
I do not agree that viruses should be classified as living organisms.

Viruses are living organisms.

a Write down **one** piece of information about viruses that supports the view of Scientist A.

.....

Challenge: these questions will make you think very hard



Challenge

In this task, you will use your understanding of what makes a separate species. You will suggest how scientists could decide how to classify a newly discovered kind of frog.

In 2016, a team of researchers from India and the National University of Singapore discovered an unusual frog in a rocky habitat near the coast of southwest India.

The frog is tiny – only about 16mm long. It looks similar to other little frogs that are classified in the genus *Microhyla*. This frog is pale brown and has black and orangey-red markings on its back, feet and sides. The males make a call that sounds like a cricket chirping.

1 Cells

1.1 Plant cells

Exercise 1.1A Structure of a plant cell

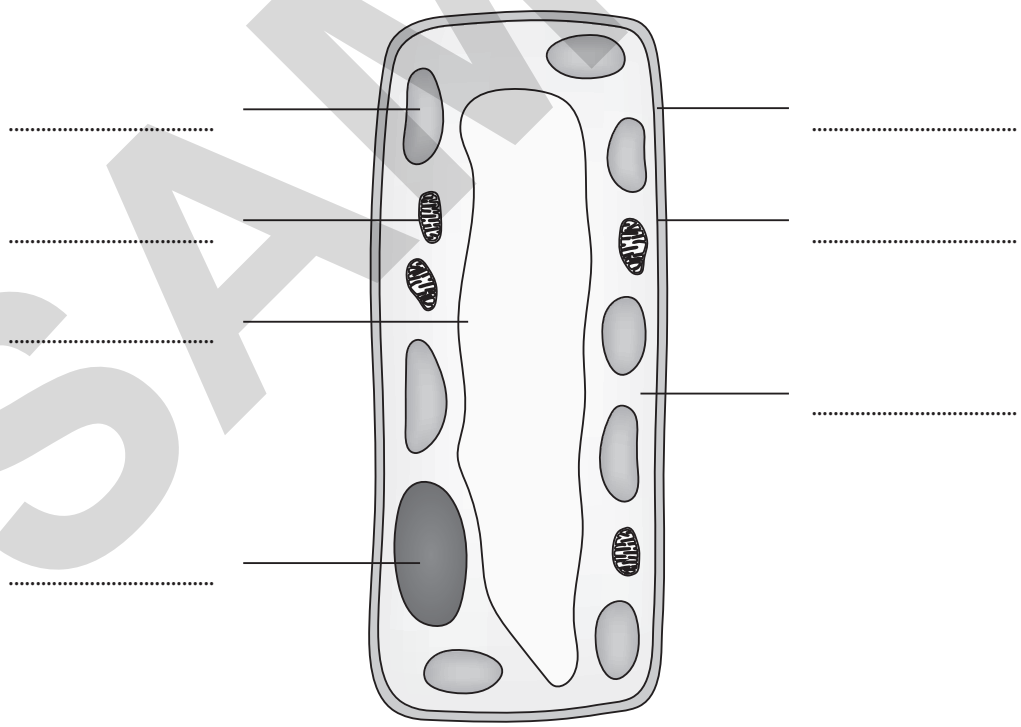
Focus

This exercise will help you to learn the names of the parts of a plant cell.

Complete the labels on the plant cell.

Use these words.

cell wall **cell membrane** **cytoplasm** **mitochondrion**
nucleus **sap vacuole** **chloroplast**

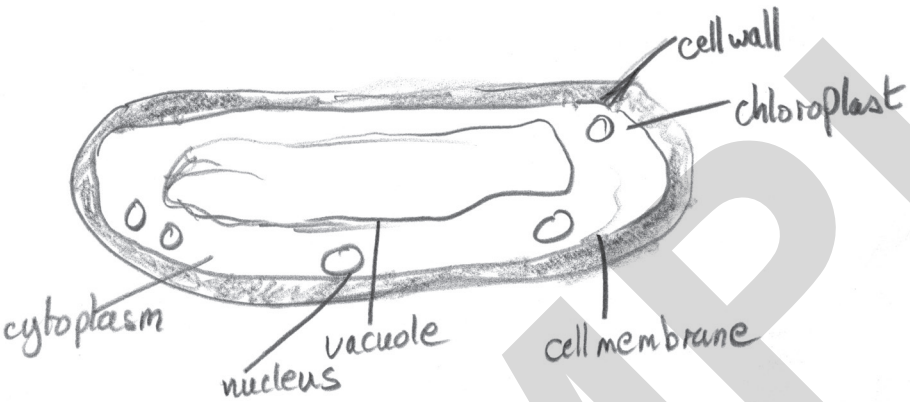


Exercise 1.1B Drawing and labelling a plant cell

Practice

In this exercise, you will practise making and labelling a clear, simple diagram.

Marcus makes a drawing of a plant cell.



Marcus's teacher gives him a list of three things he needs to do, to improve his drawing.

1 Write down **two** more ways that Marcus can improve his labels.

……

……

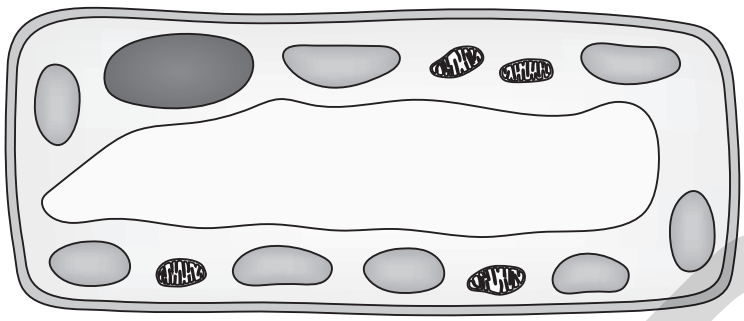
2 In the space below, draw and label a better diagram of the same plant cell.

Exercise 1.1C Different plant cells

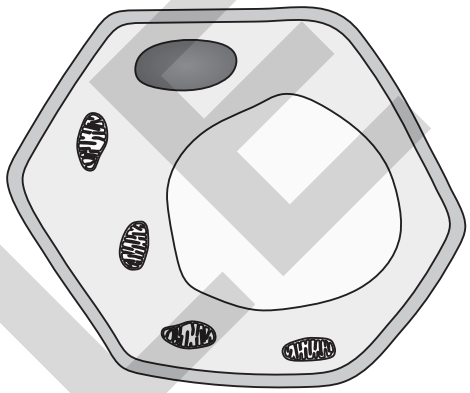
Challenge

In this exercise, you will practise making comparisons.
You will also think about why plant cells are not all the same.

The diagrams show two plant cells.



1.1C.1: Plant cell **A**.



1.1C.2: Plant cell **B**.

1 Describe **three** differences between Plant cell **A** and Plant cell **B**.

The first difference has been started for you.

First difference: Plant cell A has ……

but Plant cell B ……

……

Second difference:

……

……

Third difference:

……

……

2 Suggest which cell comes from a leaf.

Explain your suggestion.

……

……

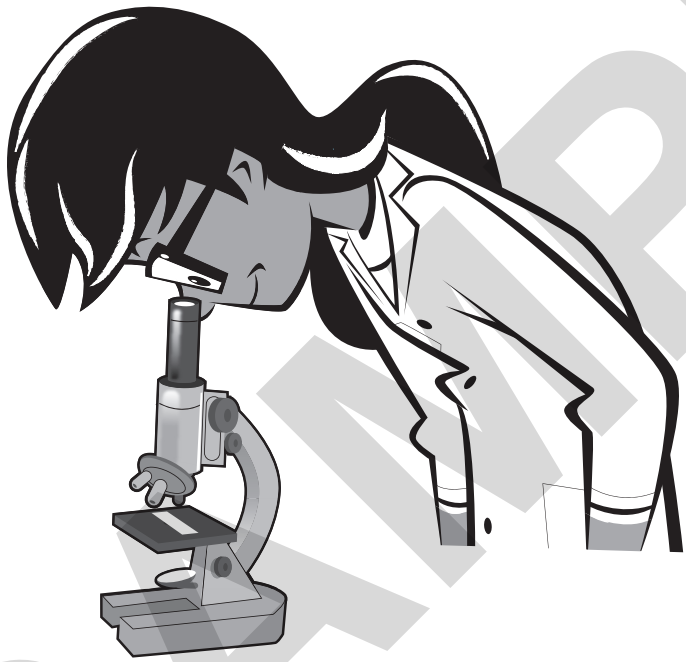
1.2 Animal cells

Exercise 1.2 How to use a microscope

Some of the things that biologists study are very small. Answering these questions will help you to become confident in using a microscope to see very small things.

Focus

1 The diagram shows a microscope.



Label the parts of the microscope. Use all of the words in this list.

stage **eyepiece** **mirror** **high-power objective lens**
medium-power objective lens **low-power objective lens**
coarse focusing knob **fine focusing knob**

Practice

2 Zara is using a microscope to look at some animal cells on a slide. She knows that there are animal cells on the slide but when she looks through the microscope, she cannot see any cells.

List **three** reasons why Zara cannot see any cells.

First reason: .....

Second reason: .....

Third reason: .....

Challenge

3 Write some advice to Zara, to help her to see the cells on her slide.

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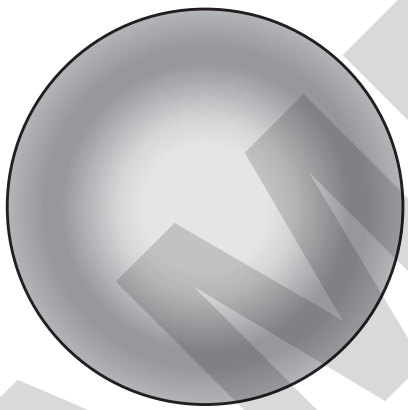
1.3 Specialised cells

Exercise 1.3 How cells are specialised for their functions

This exercise will help you to explain how cells are specialised for their functions. For Question 3a you will need to think hard about designing a table that is easy for everyone to understand. It is a good idea to try out several ideas on rough paper first.

Focus

1 The diagram shows a red blood cell.



Complete the sentences.

Choose words from the list.

You can use each word once, more than once or not at all.

capillaries **cytoplasm** **food** **haemoglobin** **oxygen**

a Red blood cells contain a substance called

…… This helps them to carry

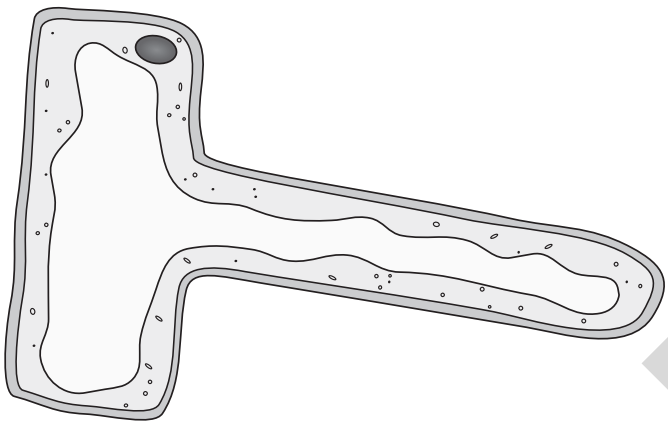
…… around the body.

b Red blood cells are smaller than most cells. This helps them to squeeze through the small blood vessels called

……

Practice

2 The diagram shows a specialised cell.



a Name this cell.

……

b Explain how you can tell that this is a plant cell and not an animal cell.

……

……

c Describe the function of this cell.

……

……

d Explain how this cell is adapted for its function.

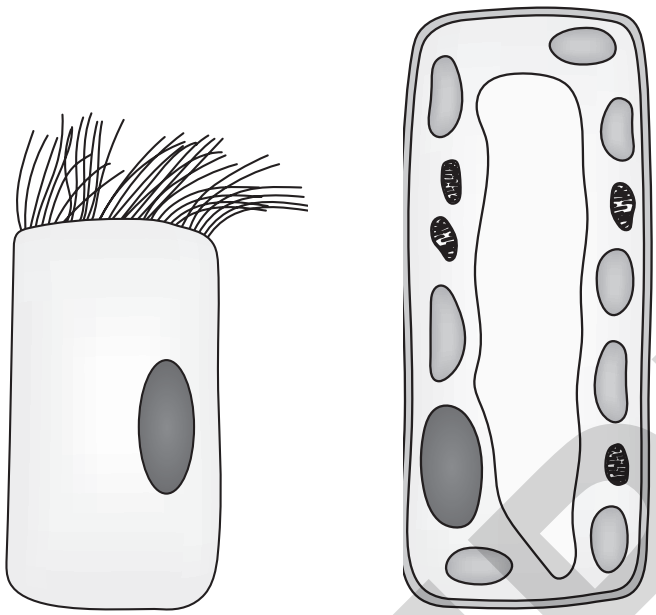
……

……

……

Challenge

3 The diagrams show two specialised cells.



a Design and draw a table that you can use to compare the structures of these two cells.

Then complete your table.

b In your own words, explain how the structure of each cell is adapted for its function.

.....

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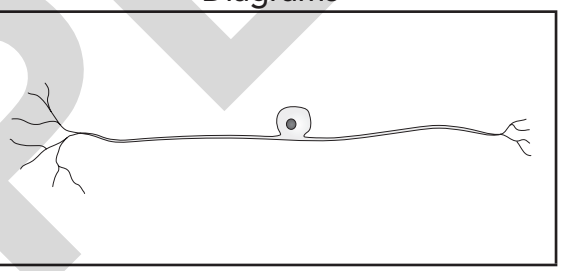
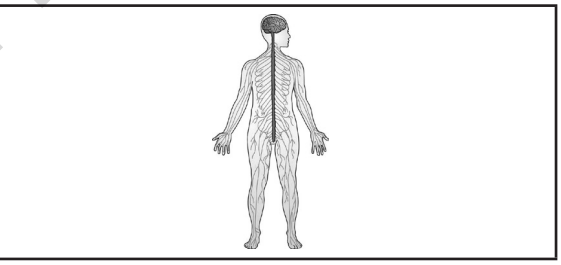
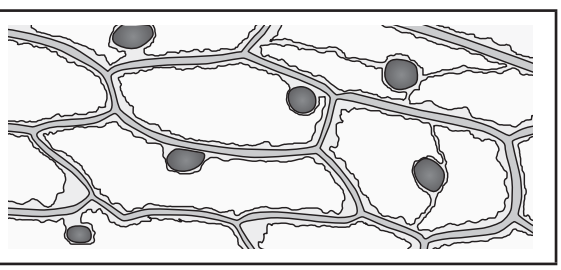
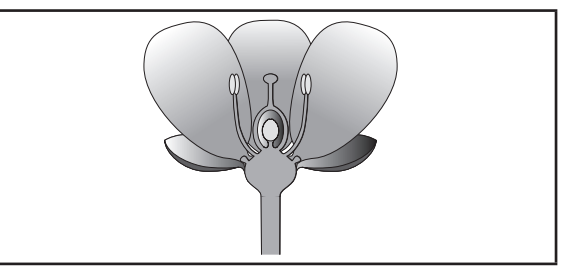
1.4 Cells, tissues and organs

Exercise 1.4A Identifying cells, tissues, organs and organ systems

Focus

This exercise will help you to remember the meanings of the words 'cell', 'tissue', 'organ' and 'organ system'.

Draw a line from each word to the correct diagram.

Words	Diagrams
cell	
tissue	
organ	
organ system	

Exercise 1.4B Human organ systems

Practice

If you studied Cambridge Science before Stage 7, you will have learnt about some of the organ systems in the human body. This will help you to complete the table. If you cannot fill in the third column from memory, look up the organ systems on the internet or in the library.

The table below is about four organ systems in the human body. These are:

respiratory system **nervous system**
circulatory system **digestive system**

Complete the table by:

- writing the name of the organ system in the second column
- writing at least **two** organs in the third column.

Function	Organ system	Some organs in the system
transporting substances around the body		
breaking down food and absorbing it into the blood		
taking oxygen into the body and getting rid of carbon dioxide		
helping different parts of the body to communicate with one another		

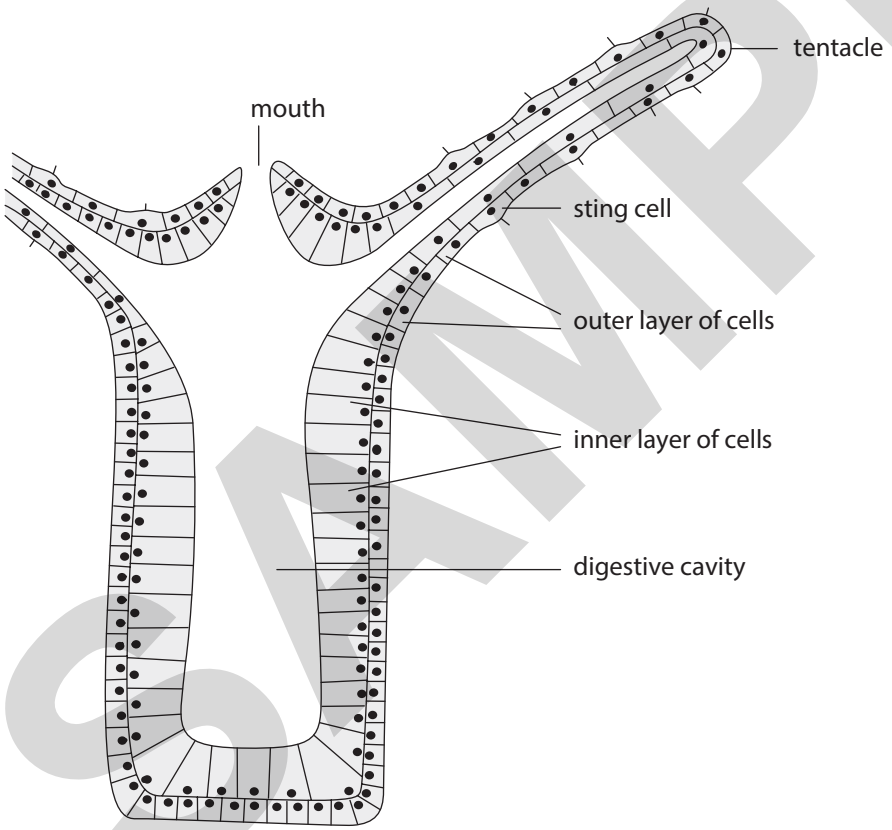
Exercise 1.4C Sting cells in *Hydra*

Challenge

In this challenging task, you will practise finding relevant information in text and diagrams. You will then apply this information, and your knowledge of cells, tissues and organs, to answer questions.

Hydra is a tiny animal that lives in freshwater ponds. It has tentacles that it uses to catch even smaller animals, which it pushes into its mouth. The mouth opens into a cavity where digestion takes place.

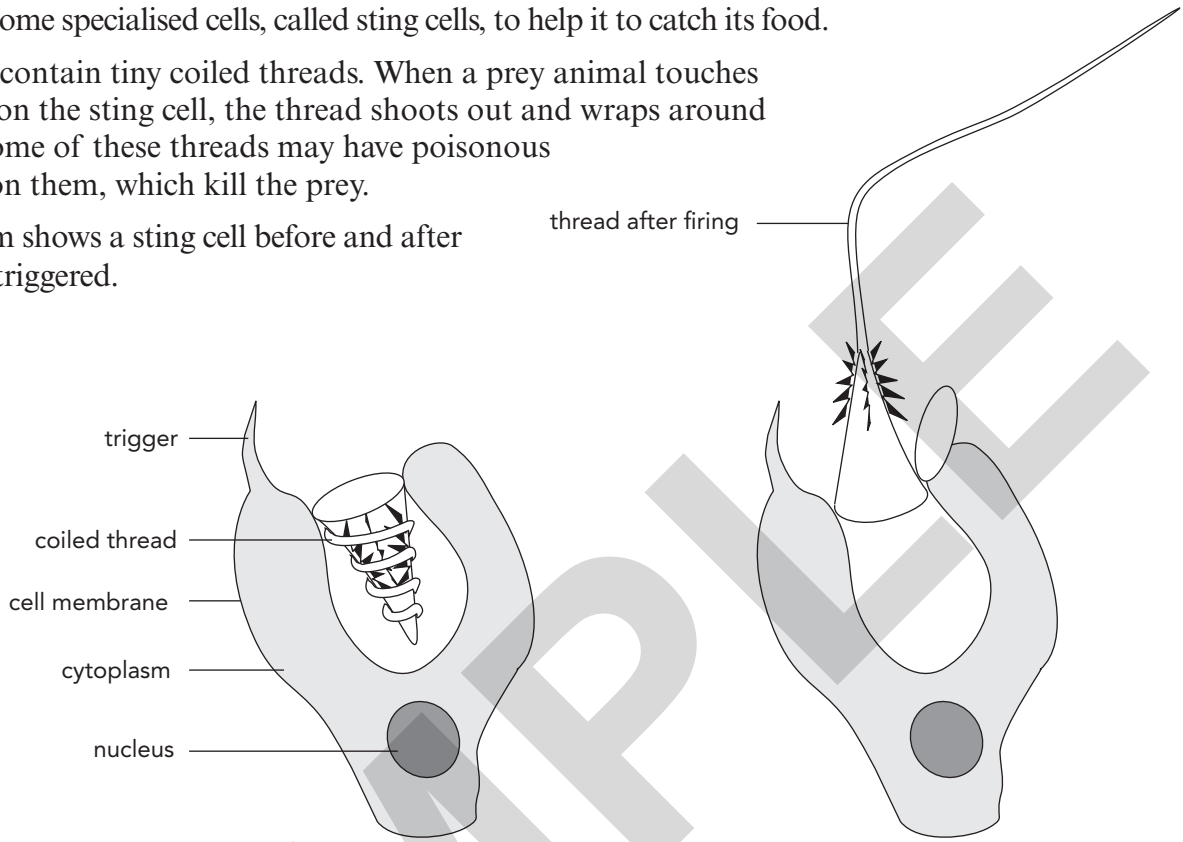
The body of *Hydra* is made up of two layers of cells. The diagram shows what *Hydra* would look like if you cut one in two, from top to bottom, and looked at it through a microscope.



Hydra has some specialised cells, called sting cells, to help it to catch its food.

These cells contain tiny coiled threads. When a prey animal touches the trigger on the sting cell, the thread shoots out and wraps around the prey. Some of these threads may have poisonous chemicals on them, which kill the prey.

The diagram shows a sting cell before and after it has been triggered.



1 For each of these parts of *Hydra*, decide whether it is a cell, a tissue or an organ.

a inner layer of cells .....

b outer layer of cells .....

c sting cell .....

d tentacle .....

2 In humans, there are several different organs that make up the digestive system.

Does *Hydra* have a digestive system? Explain your answer.

.....

.....

.....

3 List **three** features of a sting cell that you would expect to find in most animal cells.

……

……

……

4 Explain how you can tell from the diagram that the sting cell is an animal cell and not a plant cell.

……

……

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5 A sting cell is a specialised cell. In your own words, explain how a sting cell is adapted for its function.

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