UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

* 0 9 2 5 6 9 5 4 4 0 *

BIOLOGY **0610/21**

Paper 2 Core **May/June 2012**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

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1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

This document consists of **17** printed pages and **3** blank pages.

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UNIVERSITY of CAMBRIDGE International Examinations

For Examiner's Use

1 Non-living things, such as a car, often show characteristics similar to those of living organisms.

(a) State which characteristic of a living organism matches each of the descriptions linked to a car.

(i) burning fuel in the engine to release energy

..... [1]

(ii) headlights that switch on automatically in the dark

..... [1]

(iii) filling the car's tank with fuel

..... [1]

(iv) release of waste gases

..... [1]

(b) Identify **one** characteristic of living things that is **not** carried out by a car.

..... [1]

[Total: 5]

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2 **(a)** Pollutants can affect the environment.

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Draw **one** line from each pollutant listed to an effect it might have on the environment.

pollutant	effect
carbon monoxide	can cause mutations
insecticides	can cause rise of global temperature
ionising radiation	can lead to acid rain
methane	can poison top carnivores
sulfur dioxide	can reduce transport of oxygen in blood
untreated sewage	can spread diseases, such as cholera

Fig. 2.1

Draw the lines on Fig. 2.1. [6]

(b) Suggest **one** major source for each of the following pollutants.

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(i) carbon monoxide

.....

..... [1]

(ii) carbon dioxide

.....

..... [1]

(iii) ionising radiation

.....

..... [1]

[Total: 9]

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3 **(a)** Define *diffusion*.

.....

.....

.....

..... [2]

(b) Fig. 3.1 shows an apparatus that was used to investigate the effect of concentration of a chemical on the rate of diffusion.

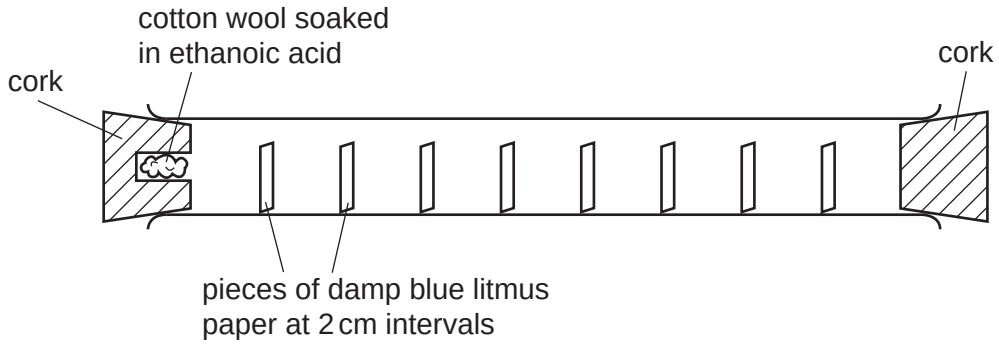


Fig. 3.1

As ethanoic acid diffused along the tube, the pieces of blue litmus paper turned red.

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[Turn over

Two different samples of ethanoic acid, **A** and **B**, were used in this apparatus. The two samples had different concentrations. The results are shown in Fig. 3.2.

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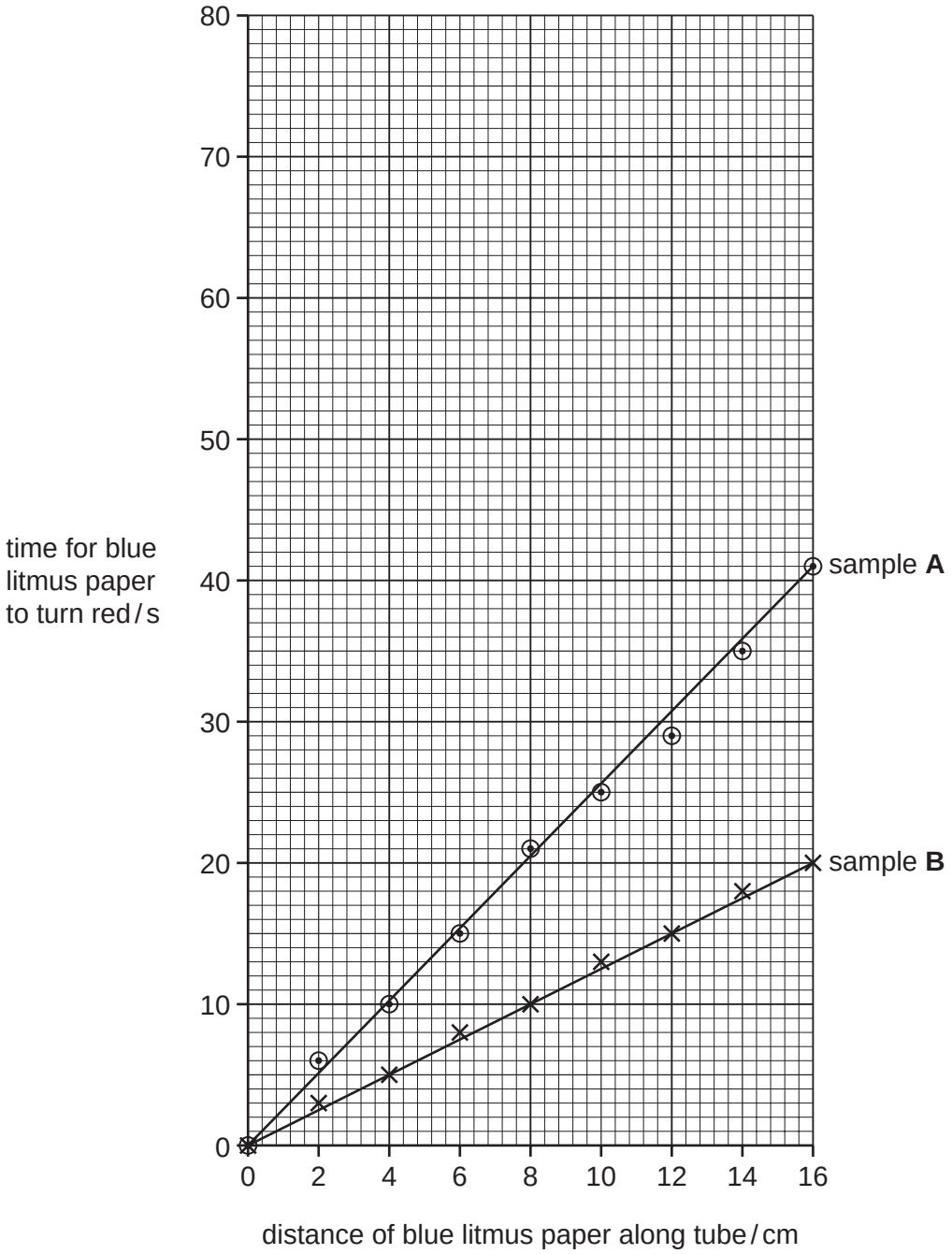


Fig. 3.2

Table 3.1 shows the results for a third sample, **C**, of ethanoic acid.

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Table 3.1

distance of blue litmus paper along tube / cm	time for blue litmus paper to turn red / s
2	9
4	18
6	28
8	35
10	45
12	55
14	63
16	72

(i) Complete Fig. 3.2 by plotting the results shown in Table 3.1.

Plot the results shown in Table 3.1 on the grid, Fig. 3.2, on page 6. [3]

(ii) State which sample of ethanoic acid, **A**, **B** or **C**, took the longest time to travel 8 cm along the tube.

..... [1]

(iii) State and explain which sample of ethanoic acid was the most concentrated.

.....

.....

.....

..... [2]

(c) Substances can enter and leave cells by either diffusion or by osmosis.

State two ways in which osmosis differs from diffusion.

1 .....

.....

2 .....

..... [2]

[Total: 10]

For Examiner's Use

4 Fig. 4.1 shows a section through the human female reproductive system.

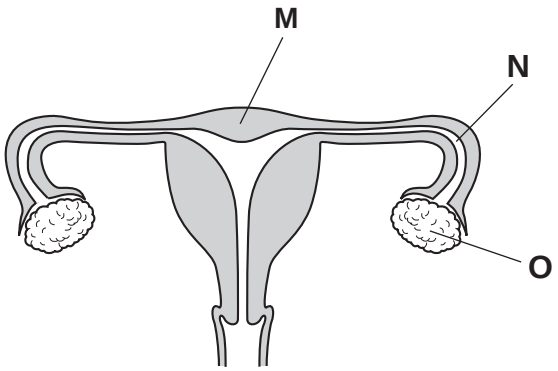


Fig. 4.1

(a) (i) State **one** function of each of the parts labelled **M** and **N**.

M .....

.....

N .....

..... [2]

(ii) State two functions of the part labelled **O**.

1 .....

.....

2 .....

..... [2]

For Examiner's Use

(b) When an adult female is **not** pregnant her menstrual cycle lasts about four weeks.

Describe the changes to the uterus and ovaries during one menstrual cycle.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(c) Fertilisation may occur after sexual intercourse.

Describe the process of fertilisation.

.....

.....

.....

..... [2]

(d) Secondary sexual characteristics in females develop at puberty.

(i) State the hormone that controls this development.

..... [1]

(ii) Describe **two** secondary sexual characteristics controlled by this hormone.

.....

.....

.....

..... [2]

[Total: 13]

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5 **(a)** The skin is important in helping to maintain a constant body temperature.

Fig. 5.1 shows a section through human skin.

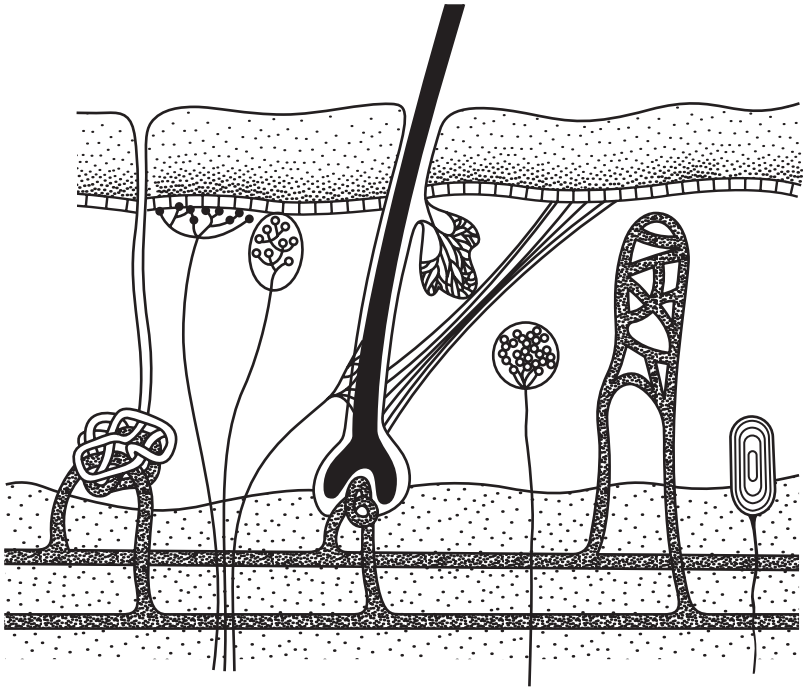


Fig. 5.1

On Fig. 5.1 label and name **three** structures that help to maintain body temperature.

Put your labels and lines on Fig. 5.1 [3]

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(b) When a student has been running, the body temperature usually rises above normal.

Explain how sweating and vasodilation help to lower the body temperature.

sweating .....

.....

.....

.....

.....

..... [3]

vasodilation .....

.....

.....

.....

.....

..... [3]

(c) Suggest **one** function of the skin, other than the control of body temperature.

.....

..... [1]

[Total: 10]

For Examiner's Use

6 **(a)** State the main features of asexual reproduction.

1 .....

.....

2 .....

..... [2]

(b) A potato plant, grown from a potato tuber, reproduces asexually.

Describe the process of asexual reproduction by potato plants.

.....

.....

.....

.....

.....

..... [3]

(c) Plants are not the only organisms that reproduce asexually.

Name two other groups of organisms that also reproduce asexually.

1 .....

2 ..... [2]

[Total: 7]

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7 **(a)** A small population of rabbits was introduced to an island where rabbits had never lived before.

Fig. 7.1 shows the change in the size of the rabbit population over a few years.

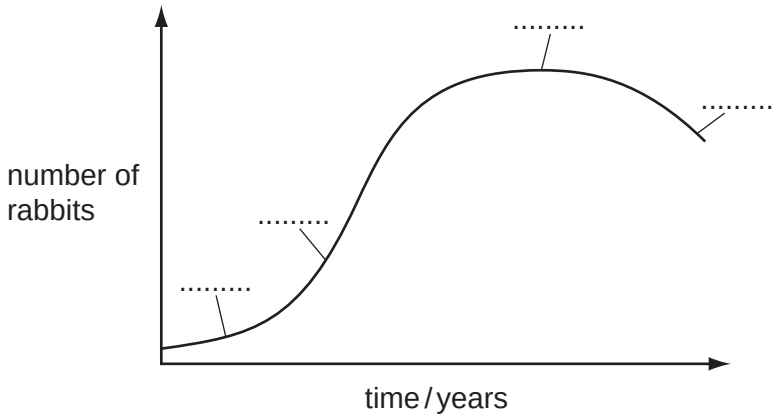


Fig. 7.1

Complete Fig. 7.1 by labelling the four phases of this population growth.

- death (use letter **D**)
- exponential (log) (use letter **E**)
- lag (use letter **L**)
- stationary (use letter **S**)

Write the letters **D**, **E**, **L** and **S** on Fig. 7.1 in the spaces provided. [3]

(b) State three factors that could affect the rate of growth of this rabbit population.

1 .....

2 .....

3 ..... [3]

[Total: 6]

For Examiner's Use

8 **(a)** All organisms depend on enzymes.

Define the term *enzyme* and describe the function of enzymes in living organisms.

.....

.....

.....

.....

.....

..... [3]

(b) Samples of an amylase enzyme were incubated with starch at different temperatures. The rate of starch digestion in each sample was recorded and points plotted on the graph shown in Fig. 8.1.

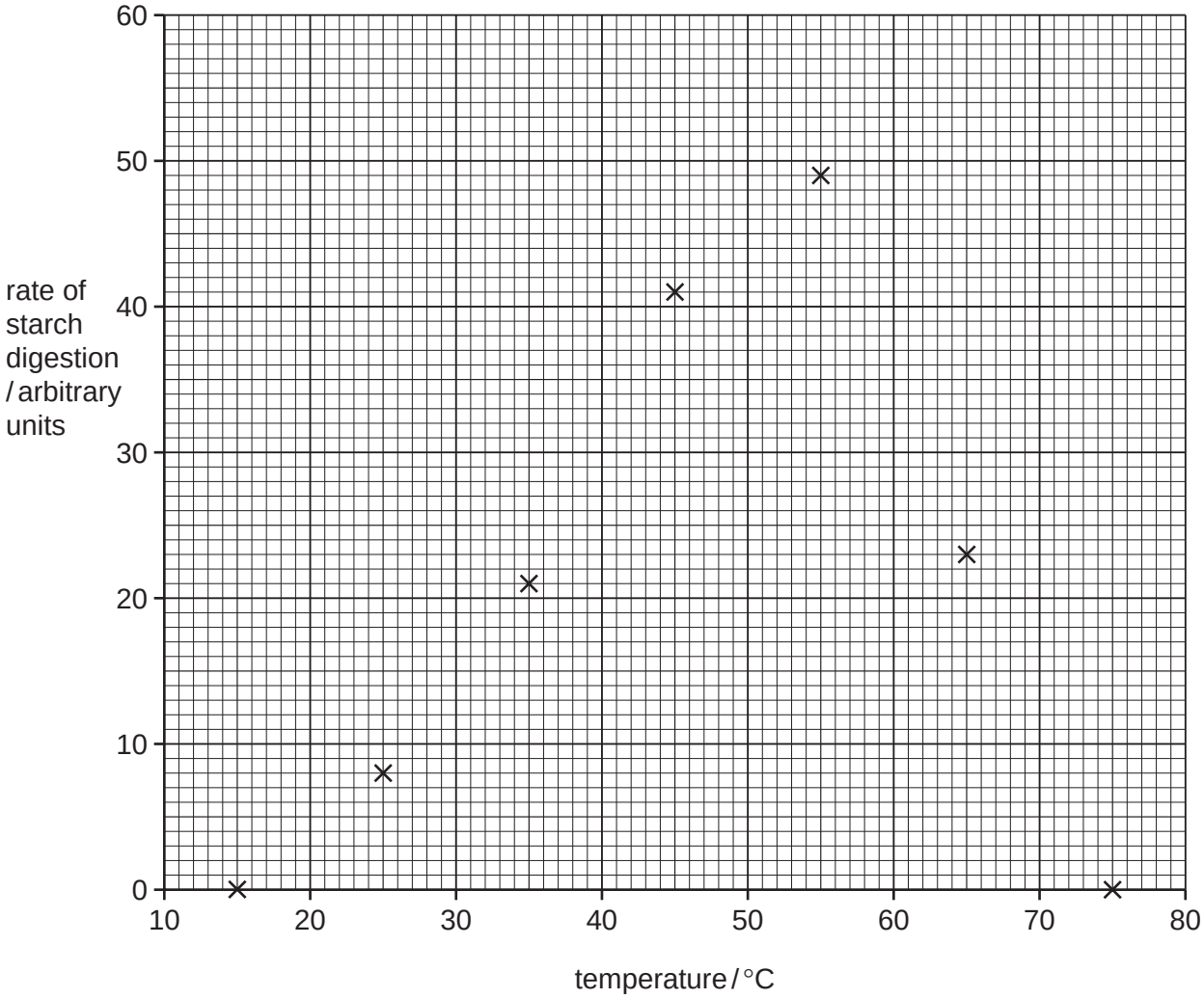


Fig. 8.1

For Examiner's Use

(i) Complete this line graph to show the effect of temperature on rate of digestion of starch by the amylase enzyme by adding the most appropriate line to Fig. 8.1.

Put your line on Fig. 8.1. [1]

(ii) Using your graph estimate the optimum temperature for this enzyme.

..... [1]

(iii) Suggest the rate of starch digestion at 37 °C.

..... [1]

(iv) Describe the effect of temperature on the rate of starch digestion.

.....

.....

.....

..... [2]

(v) The enzymes originally incubated at 15 °C and 75 °C did not digest any starch. These samples were later incubated at the optimum temperature.

Predict what results could be expected in each sample and suggest reasons for your predictions.

.....

.....

.....

.....

.....

..... [3]

[Total: 11]

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9 **(a)** Phloem and xylem are two types of tissue in plants.

Fig. 9.1 shows a section through a plant stem, **A**, and a plant leaf, **B**.

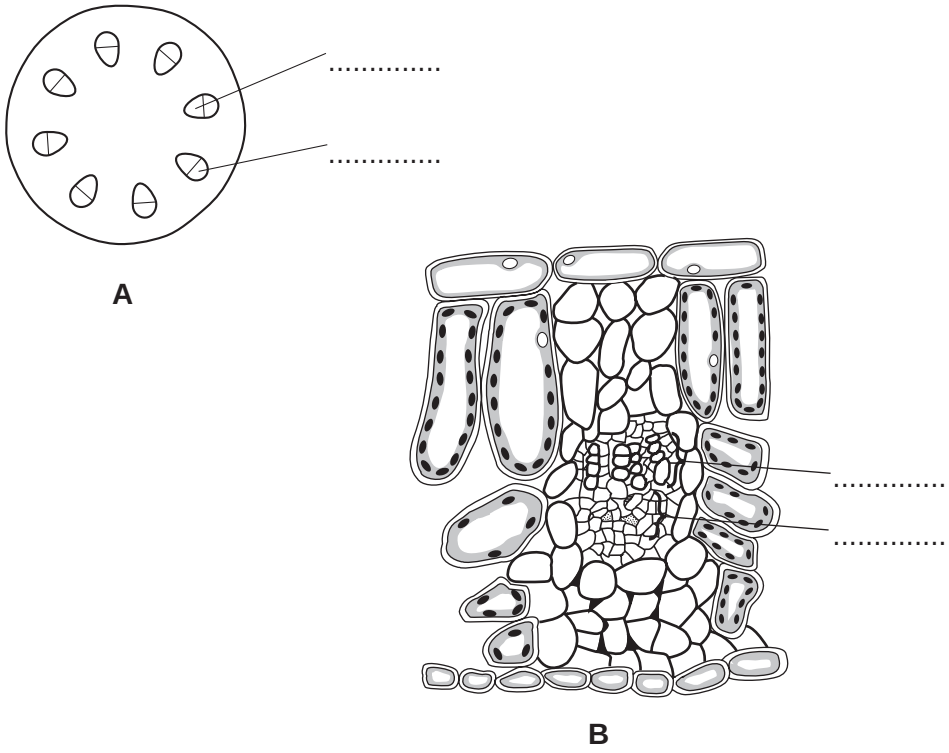


Fig. 9.1

(i) Label the phloem (**P**) and the xylem (**X**) on both **A** and **B** on Fig. 9.1.

Write the letters **P** and **X** on **both A** and **B** on Fig. 9.1. [2]

(ii) Describe two functions of the xylem.

1 .....

.....

2 .....

..... [2]

(b) Translocation takes place in the phloem tissue.

(i) State which materials are translocated in the phloem.

.....

..... [2]

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(ii) Fig. 9.2 shows a plant in the sunlight. The three lines (———) are arrows, with no arrow heads, showing the translocation of materials within parts of the plant.

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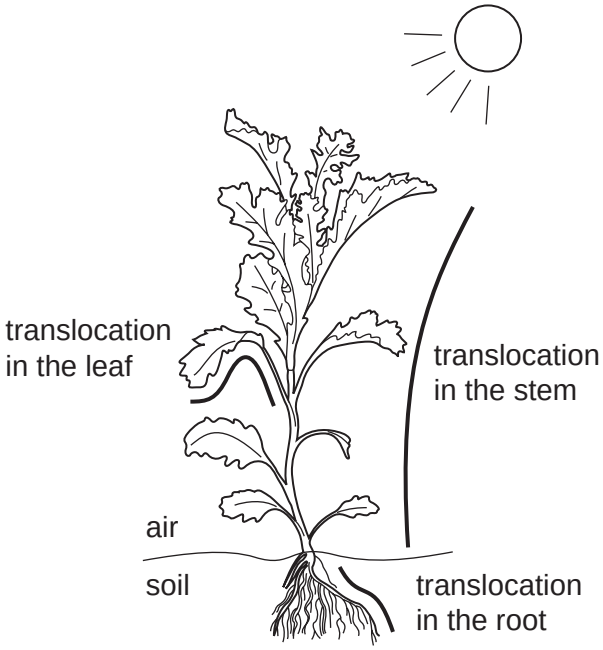


Fig. 9.2

Add arrow heads to **each** of the **three** lines to show the direction of translocation in the organs shown.

Put one arrow head on each of the **three** lines on Fig. 9.2 [3]

[Total: 9]

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