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MARINE SCIENCE

0697/03

Paper 3 Practical Assessment Paper

May/June 2021

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages. Any blank pages are indicated.

1 (a) Fig. 1.1 shows a diagram of a dissected fish.

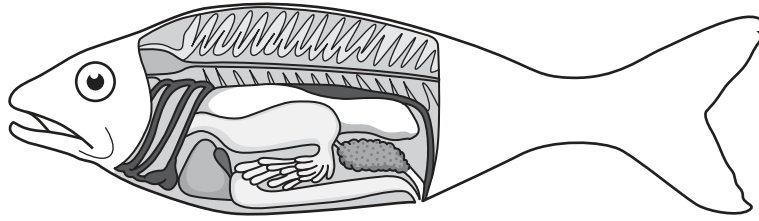


Fig. 1.1

On Fig. 1.1 label:

- swim bladder
- gut
- gonad.

[3]

(b) Fig. 1.2 shows a single gill of a fish.

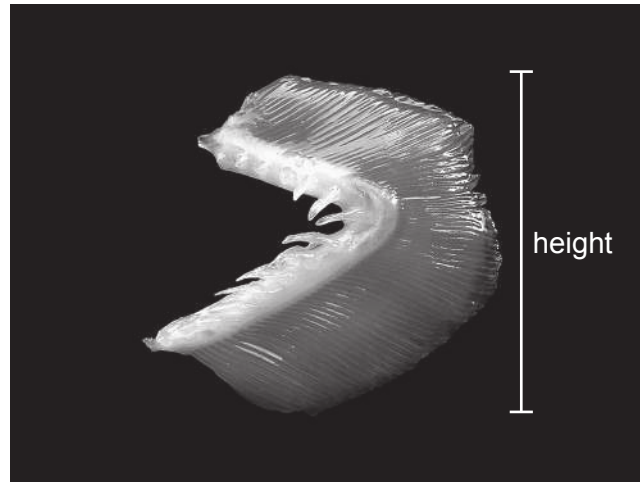


Fig. 1.2

In the space below draw a large diagram of the gill.

(c) (i) Measure the height of the gill in Fig. 1.2, and record it with the units.

..... [2]

(ii) The magnification of the photograph is $\times 2.5$.

Calculate the actual height of the gill.

Use the formula

$$\text{magnification} = \frac{\text{image size}}{\text{actual size}}$$

..... cm [2]

[Total: 11]

2 (a) Table 2.1 shows fish in three different habitats.


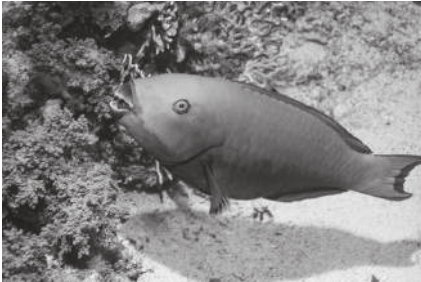

The habitats are:

- a coral reef
- the open ocean
- the sea bed.

Complete Table 2.1 by identifying the habitat for each fish.

For each fish state **one** adaptation to their habitat that is visible in the photographs.

Table 2.1

		
<p>habitat</p> <p>.....</p>	<p>habitat</p> <p>.....</p>	<p>habitat</p> <p>.....</p>
<p>adaptation to the habitat</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>adaptation to the habitat</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>adaptation to the habitat</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

[4]

- (b) Scientists investigate the swimming speeds of three species of fish **J**, **K** and **L** from different habitats.

Fig. 2.1 shows the measuring tape for Fish **J** on its timed swim.

The timed swim starts at **S** and ends at **F**.

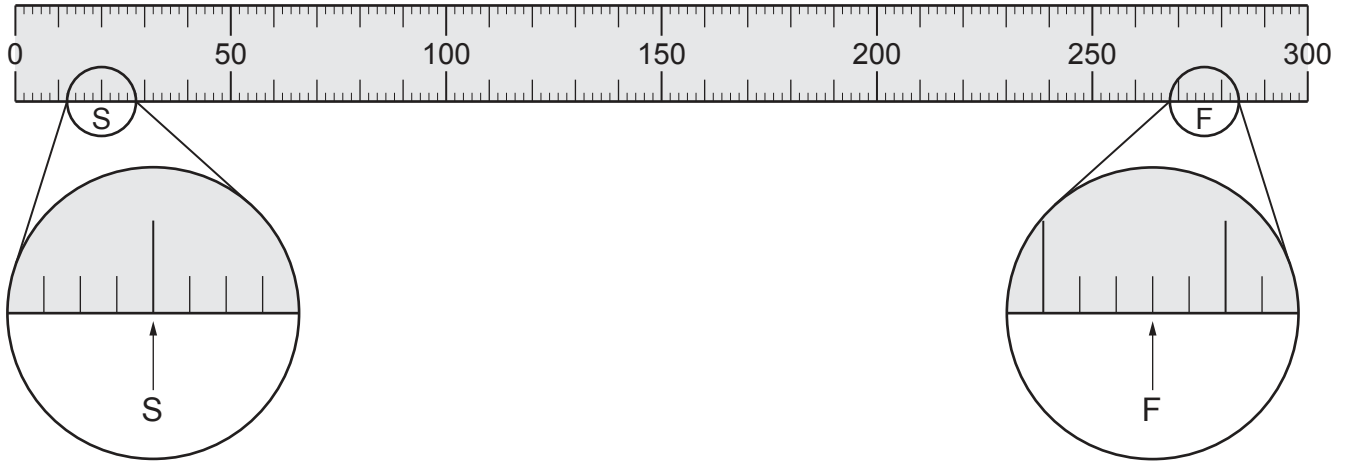


Fig. 2.1

Table 2.2 shows some of the results of the investigation.

Table 2.2

fish species	distance covered /cm	time taken /s	swimming speed /cm per s
J
K	1092	6	182
L	114 000	60	1900

- (i) Calculate the distance travelled by Fish **J** during the timed swim. Add this to Table 2.2. [1]

Fig. 2.2 shows the stopwatch used to time the swim of Fish J.

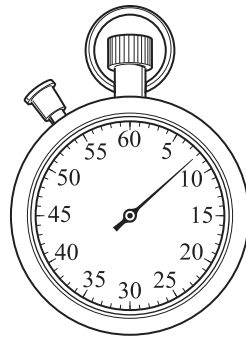


Fig. 2.2

(ii) Record the time taken in Table 2.2. [1]

(iii) Calculate the swimming speed of Fish J and record this in Table 2.2.

Use the formula

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

[1]

(iv) Suggest which fish, J, K or L, is from the open ocean.

Fish

[1]

[Total: 8]

3 A scientist investigates abiotic factors in a beach environment.

(a) Describe a method used to measure the slope of a beach.

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..... [4]

(b) Describe a method used to measure the tidal amplitude at a beach over a 24-hour period.

Include a safety precaution.

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..... [4]

(c) Describe the method used to measure the mean water-current speed in the near-shore area of the beach.

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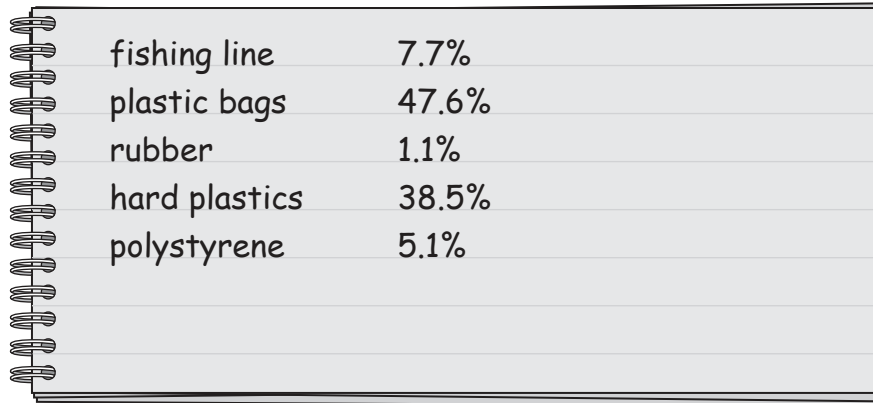
..... [5]

[Total: 13]

- 4 Scientists investigate the gut contents of juvenile green sea turtles that are found dead.

The gut contents contain plastics and litter.

Fig. 4.1 shows the percentage of the different types of plastic and litter found in the sea turtles' gut.



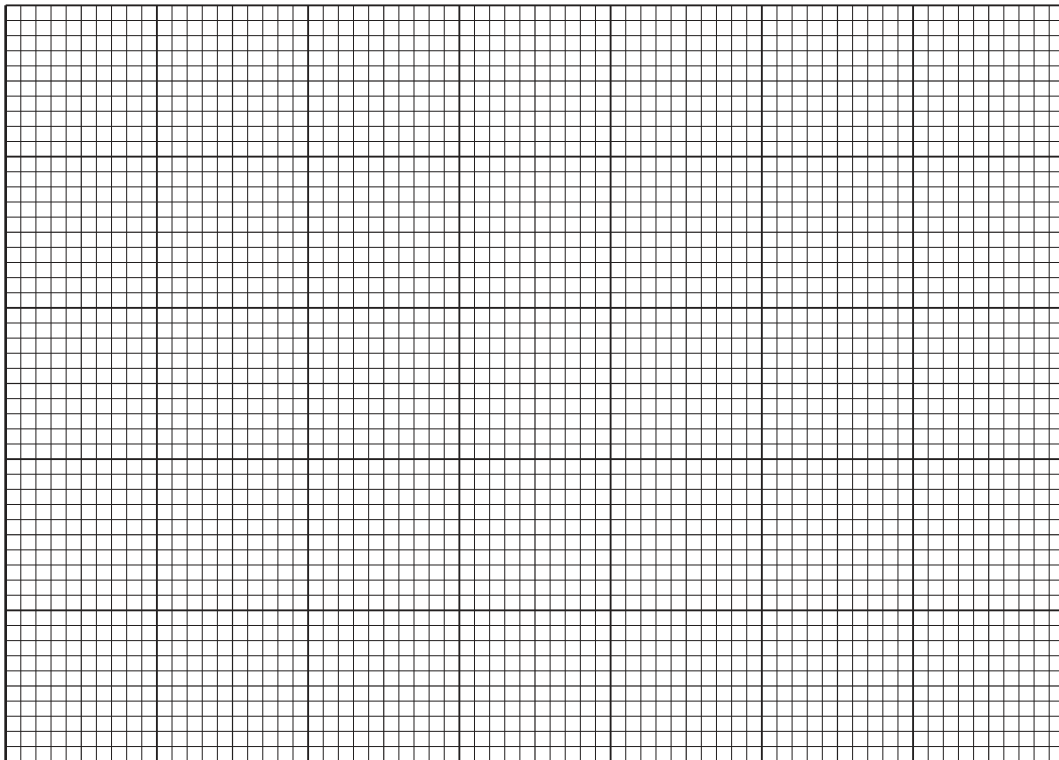
fishing line	7.7%
plastic bags	47.6%
rubber	1.1%
hard plastics	38.5%
polystyrene	5.1%

Fig. 4.1

- (a) Draw a table to present this data, ranking the items from highest percentage to lowest percentage.

[4]

(b) Draw a bar graph to represent this data.



[4]

(c) Suggest **two** impacts this plastic and litter has on the sea turtles.

- 1
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- 2
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[2]

[Total: 10]

- 5 A student knows that red algae can grow at greater depths than green algae. The student forms the hypothesis:

'red algae photosynthesise more at low light intensities than green algae'

- (a) Design and describe an investigation which you could carry out to test this hypothesis.

Use the headings given to structure your answer.

- Method, including all the equipment needed
- The presentation and evaluation of the results

Method, including all the equipment needed

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Presentation and evaluation of the results

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[13]

(b) Describe the limitations of your method.

Suggest further work to extend and improve the investigation.

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[5]

[Total: 18]

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