

1 Fig. 1.1 shows a herring, a pelagic fish.



Fig. 1.1

(a) In the space below, make an accurate drawing of this fish, to the same magnification. Detail of individual scales is not required.

[4]

(b) On your drawing, label each of the following features.

- operculum
- pectoral fin
- anal fin
- caudal fin

[4]

(c) The actual total length of the fish in Fig. 1.1 is 28 cm.

(i) Measure and record the total length of the fish in Fig. 1.1.

.....
[1]

(ii) Use these measurements to calculate the magnification of Fig. 1.1.

Show your working.

.....
[2]

(d) Herrings are classified as chordates.

Name **one** feature, visible in Fig. 1.1, which is characteristic of chordates.

.....[1]

[Total: 12]

- 2 Fig. 2.1 shows two organisms, **A** and **B**, from the marine environment. The organisms are not to the same scale.

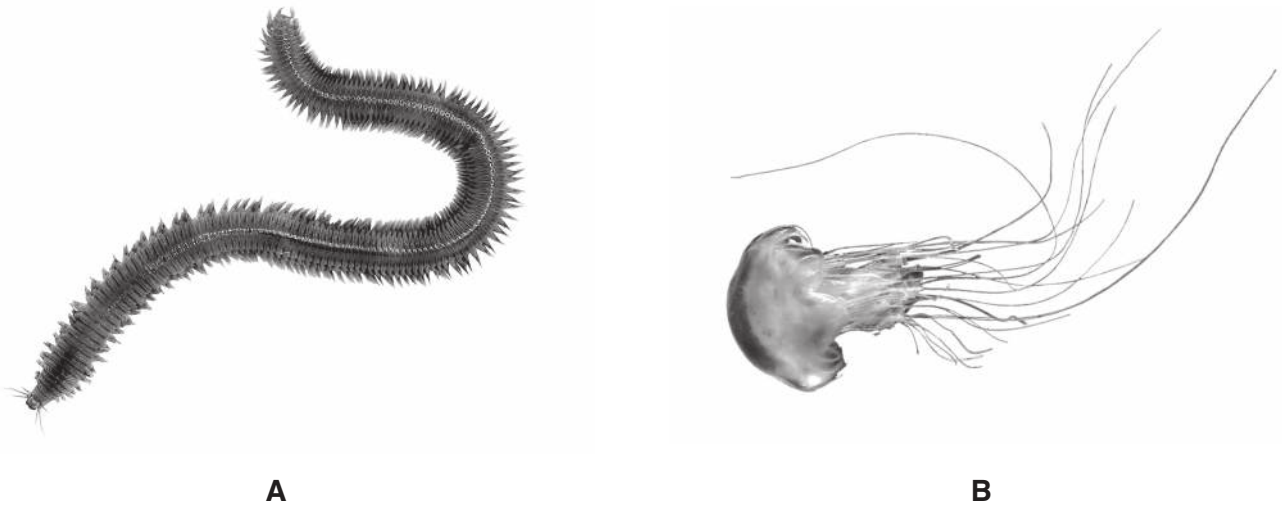


Fig. 2.1

- (a) Name the phylum (major group) to which each of these organisms belongs.

A

B

[2]

- (b) Table 2.1 refers to features of organism **A** and organism **B**.

If the feature is present, place a tick (✓) in the box. If the feature is absent, place a cross (✗) in the box.

Table 2.1

feature	organism A	organism B
segmented body		
tentacles		
pairs of parapodia		
head with antennae		
separate mouth and anus		

[5]

[Total: 7]

- 4 A student investigated the relationship between the length and mass of a sample of five fish.

The student measured the length and the mass of each fish. The results are shown below.

Fish 1 length = 36 cm, mass = 0.40 kg

Fish 2 length = 35 cm, mass = 0.38 kg

Fish 3 length = 38 cm, mass = 0.44 kg

Fish 4 length = 34 cm, mass = 0.36 kg

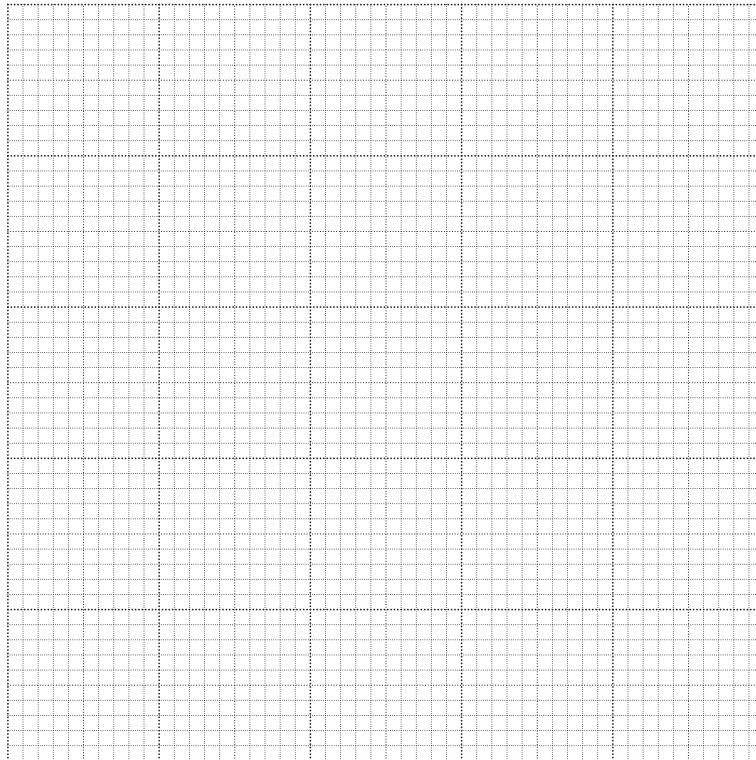
Fish 5 length = 37 cm, mass = 0.42 kg

- (a) In the space below, prepare a suitable table of these results.

In your table, rank the length of fish from lowest to highest.

[4]

(b) Plot a line graph of the results, to show the relationship between the length and the mass of these fish.



[4]

(c) What conclusion can be drawn from this investigation?

.....
.....[1]

(d) Calculate the mean length and the mean mass of the five fish.

mean length cm

mean mass kg
[2]

[Total: 11]

- 5 Fig. 5.1 shows a mussel. Mussels are molluscs found on rocky shores. Fig. 5.2 shows a population of mussels.



magnification $\times 2$
Fig. 5.1



Fig. 5.2

A student noticed that there were more mussels on the middle part of a shore than on the upper shore.

The student formed the following hypothesis.

The number of mussels per unit area is higher on the middle shore than it is on the upper shore.

Design an investigation which you could carry out to test this hypothesis, using the headings below to structure your answer.

- Method, including any apparatus required and safety precautions.
- Presentation and evaluation of results.
- Limitations of your method and suggestions for further work to extend the study.

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