AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.5.3

Sustainable fisheries

Past-paper questions

Tier	**Foundation**
Question groups	**7**
Available paper years	**2007–2021**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.7.5.3 Sustainable fisheries

Question 01

June 2007 | BLY1F | Original Q7 | Legacy

7 Read the article about sustainable cod fishing.

> Every December the European Commission makes proposals for cod fishing quotas in European Union (EU) waters. These quotas take into account data obtained by scientists.
>
> Scientists calculate what proportion of the cod stock is being caught each year. They do this by working out the numbers in each age-group of cod.
>
> Every year the fishermen say the scientists are exaggerating the danger to the stocks in the North Sea. The scientists say the fishermen are threatening their own long-term livelihoods by ignoring their warnings of a collapse of cod populations.
>
> The scientists say that fishermen go only to parts of the sea where there are a lot of cod, so they get the wrong idea of the number of cod in the whole area.

(a) The scientists and the fishermen have different opinions about the size of the cod population.

Explain why.

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(2 marks)

(b) The final decision on how many cod the fishermen are allowed to catch may not depend entirely on the data produced by the scientists.

Suggest **two** reasons for this.

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2 .....

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(2 marks)

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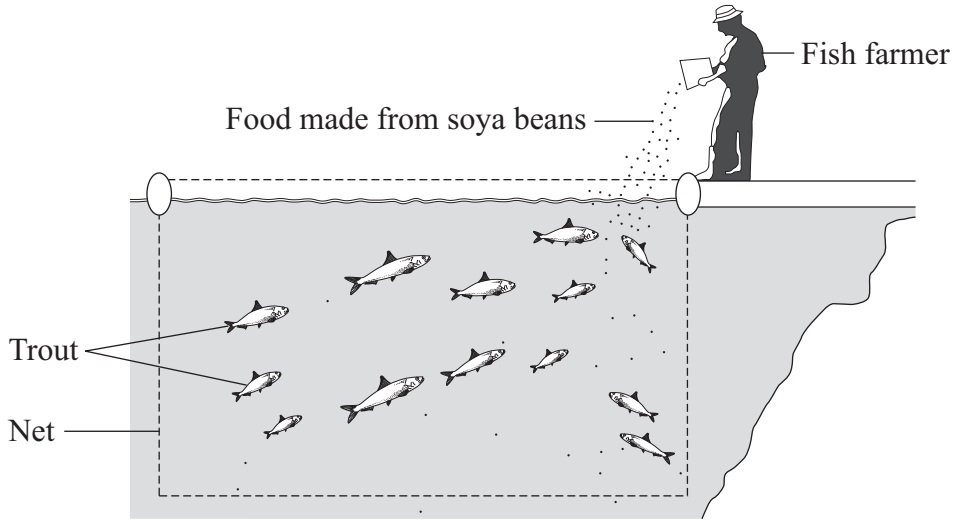
4.7.5.3 Sustainable fisheries

Question 02

January 2019 | BLY2F | Original Q6 | Legacy

6 A fish farmer keeps trout in a large net in a lake.



The fish farmer feeds the trout on food made from soya beans.

When the trout are large enough the farmer sells them for food for people.

6 (a) Draw a pyramid of biomass for the three organisms in this food chain.

Label the pyramid.

(2 marks)

4.7.5.3 Sustainable fisheries

Question 02 · continued

for mark

6 (b) It would be more energy efficient if people ate the soya beans rather than eating the trout.

Which **two** of the following are reasons for this?

Tick (✓) **two** boxes.

Some people do not like eating animals such as trout. ☐

The trout release energy when they respire. ☐

Soya bean plants release energy when they respire. ☐

Some energy will be lost in waste from the trout. ☐

Soya bean plants absorb energy during photosynthesis. ☐

(2 marks)

6 (c) Suggest **one** advantage to the fish farmer of keeping the trout in a large net instead of letting them swim freely in the lake.

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(1 mark)

6 (d) Some trout die before they are large enough to be sold.
The dead trout contain carbon.

Use your knowledge of the carbon cycle to describe how this carbon is returned to the atmosphere after the trout die.

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(2 marks)

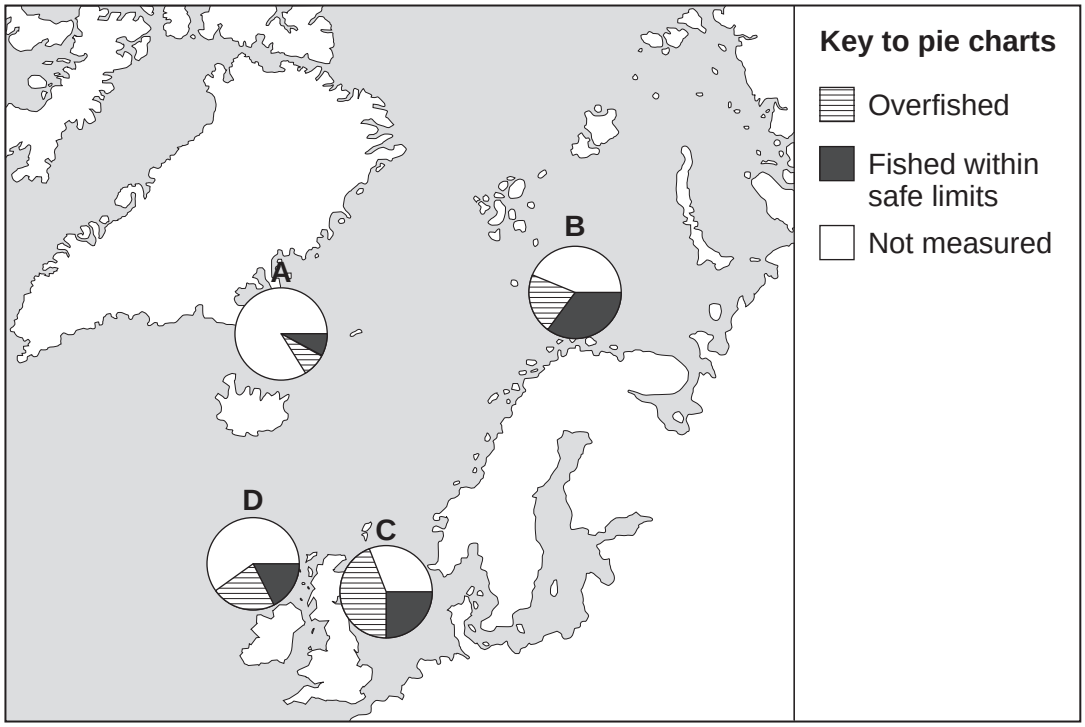
7

4.7.5.3 Sustainable fisheries

Question 03

June 2013 | BL3FP | Original Q6 | Legacy

6 The map shows pie charts, **A**, **B**, **C** and **D**, that give information about fisheries in some of the seas around Europe.



6 (a) Which pie chart, **A**, **B**, **C** or **D**, shows the fishery with the largest amount of overfishing? ☐

(1 mark)

6 (b) It is important to maintain fish stocks high enough for breeding to continue.

Give the reason why.

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(1 mark)

6 (c) Give **two** ways fish stocks can be conserved.

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(2 marks)

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4.7.5.3 Sustainable fisheries

Question 04

6 The number of fish in the oceans is decreasing.

Table 4 shows information about the mass of fish caught by UK fishermen between 2002 and 2010.

Table 4

Year	Mass of fish caught by UK fishermen from ALL SOURCES in thousands of tonnes	Mass of fish caught by UK fishermen from SUSTAINABLE SOURCES in thousands of tonnes	Percentage of fish caught from sustainable sources
2002	690.0	427.8	62.0
2004	655.0	396.6	60.5
2006	619.0	386.0	62.4
2008	589.0	436.1	74.0
2010	611.5	465.0	

6 (a) (i) Calculate the percentage of fish caught from sustainable sources in 2010.

[2 marks]

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4.7.5.3 Sustainable fisheries

Question 04 · continued

6 (a) (ii) Describe the pattern in **Table 4** for the mass of fish caught from all sources.

Suggest reasons for this pattern.

[4 marks]

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6 (a) (iii) Suggest why the percentage of fish caught from sustainable sources is increasing.

[1 mark]

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6 (b) Give **two** methods of maintaining fish stocks at a sustainable level.

[2 marks]

1 .....

2 .....

Question 6 continues on the next page

4.7.5.3 Sustainable fisheries

Question 04 · continued

6 (c) **Figure 10** shows a fish farm.

Figure 10



In a fish farm, large numbers of fish are grown in cages in the sea.

Why do fish in the cages grow faster than fish of the same species that are free in the sea?
You should refer to energy in your answer.

[4 marks]

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13

4.7.5.3 Sustainable fisheries

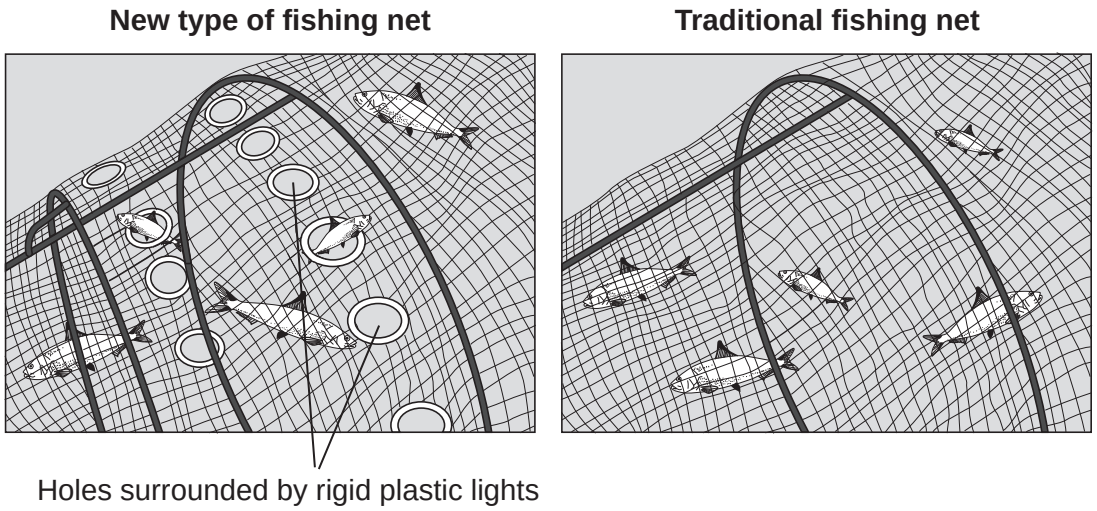
Question 05

June 2016 | BL3FP | Original Q5 | Legacy

5 It is important to conserve fish stocks.

Figure 7 shows a new type of fishing net and a traditional fishing net.

Figure 7



5 (a) (i) Describe how the new type of fishing net helps to conserve fish stocks.

[3 marks]

5 (a) (ii) Give **one** way, other than controlling nets, to reduce overfishing.

[1 mark]

4.7.5.3 Sustainable fisheries

Question 05 · continued

5 (b) Another way to make sure there is food for an increasing human population is to make food production more efficient.

Figure 8 shows how some cows are farmed.

Figure 8



5 (b) (i) Use information from **Figure 8** to suggest **two** ways in which this type of farming reduces energy loss from the cows.

[2 marks]

1 _____

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2 _____

_____

5 (b) (ii) Give **two** reasons why some people disagree with farming cows in this way.

[2 marks]

1 _____

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2 _____

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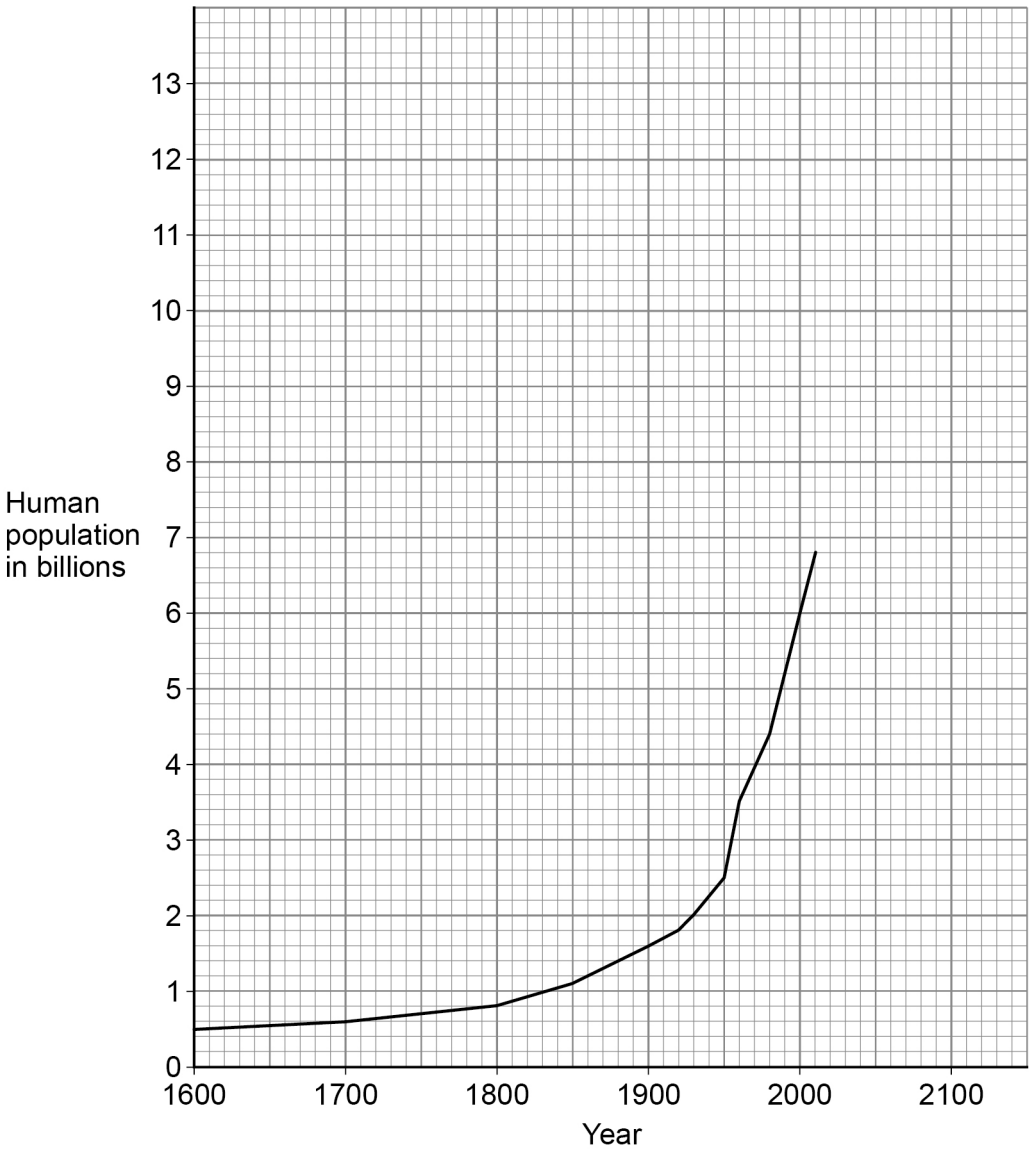
4.7.5.3 Sustainable fisheries

Question 06

November 2020 | 8461/2F | Original Q9

0 9 **Figure 12** shows the human population from 1600 to 2010.

Figure 12



In 1900 the human population was 1.6 billion.

0 9 . 1 Calculate how many times greater the human population was in the year 2000 compared with the year 1900.

[2 marks]

Number of times greater = _____

4.7.5.3 Sustainable fisheries

Question 06 · continued

0 9 . 2 In 1950 the human population was 2.5 billion.

Calculate the mean annual increase in the human population between 1900 and 1950.

[2 marks]

Mean annual increase = _____ billion per year

0 9 . 3 Predict the human population in 2050 if the current rate of population increase continues.

You should draw an extrapolation line on **Figure 12**.

[2 marks]

Predicted human population = _____

0 9 . 4 The increasing human population has caused a decline in fish stocks.

Describe how fishing quotas can help to return fish stocks to a sustainable level.

[2 marks]

Question 9 continues on the next page

4.7.5.3 Sustainable fisheries

Question 06 · continued

0 9 . 5 Farming techniques have changed in recent years.

Describe:

- why more land is being used for farming
- how increased farming has decreased biodiversity.

[6 marks]

4.7.5.3 Sustainable fisheries

Question 06 · continued

0 9 . 6 Genetic modification of crop plants can help meet the demands of the increasing human population.

Golden rice is a genetically modified (GM) crop.

What is the advantage of golden rice compared with non-GM rice?

[1 mark]

Tick (✓) **one** box.

Golden rice contains protein-rich mycoprotein ☐

Golden rice has improved nutritional value ☐

Golden rice produces human insulin ☐

0 9 . 7 Suggest **one** reason why some people are concerned about the use of golden rice.

[1 mark]

_____

_____

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4.7.5.3 Sustainable fisheries

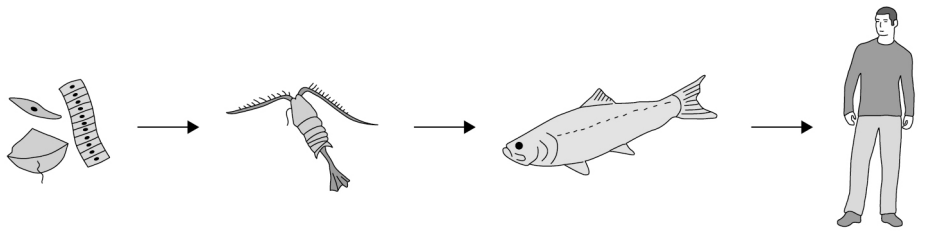
Question 07

November 2021 | 8461/2F | Original Q3

0 3 People eat fish caught in the North Sea.

Figure 4 shows a food chain.

Figure 4



Not to scale

0 3 . 1 The algae make glucose by photosynthesis.

Which **two** substances do the algae need for photosynthesis?

[2 marks]

Tick (✓) **two** boxes.

- Carbon dioxide ☐
- Nitrogen ☐
- Oxygen ☐
- Starch ☐
- Water ☐

4.7.5.3 Sustainable fisheries

Question 07 · continued

0 3 . 2 What is the source of energy for photosynthesis?

[1 mark]

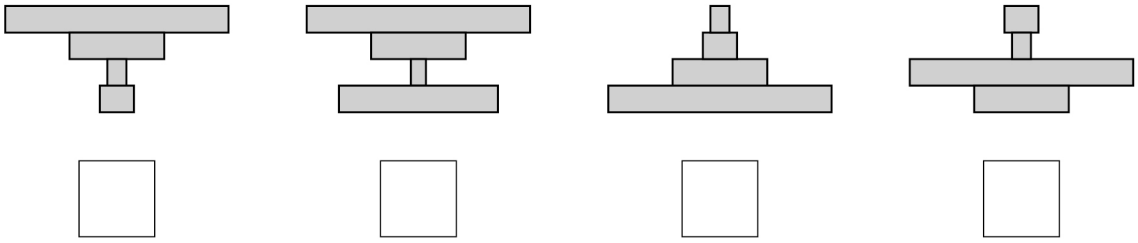
Tick (✓) **one** box.

- Light ☐
- Mineral ions ☐
- Protein ☐
- Water ☐

0 3 . 3 Which pyramid of biomass is correct for the food chain shown in **Figure 4**?

[1 mark]

Tick (✓) **one** box.



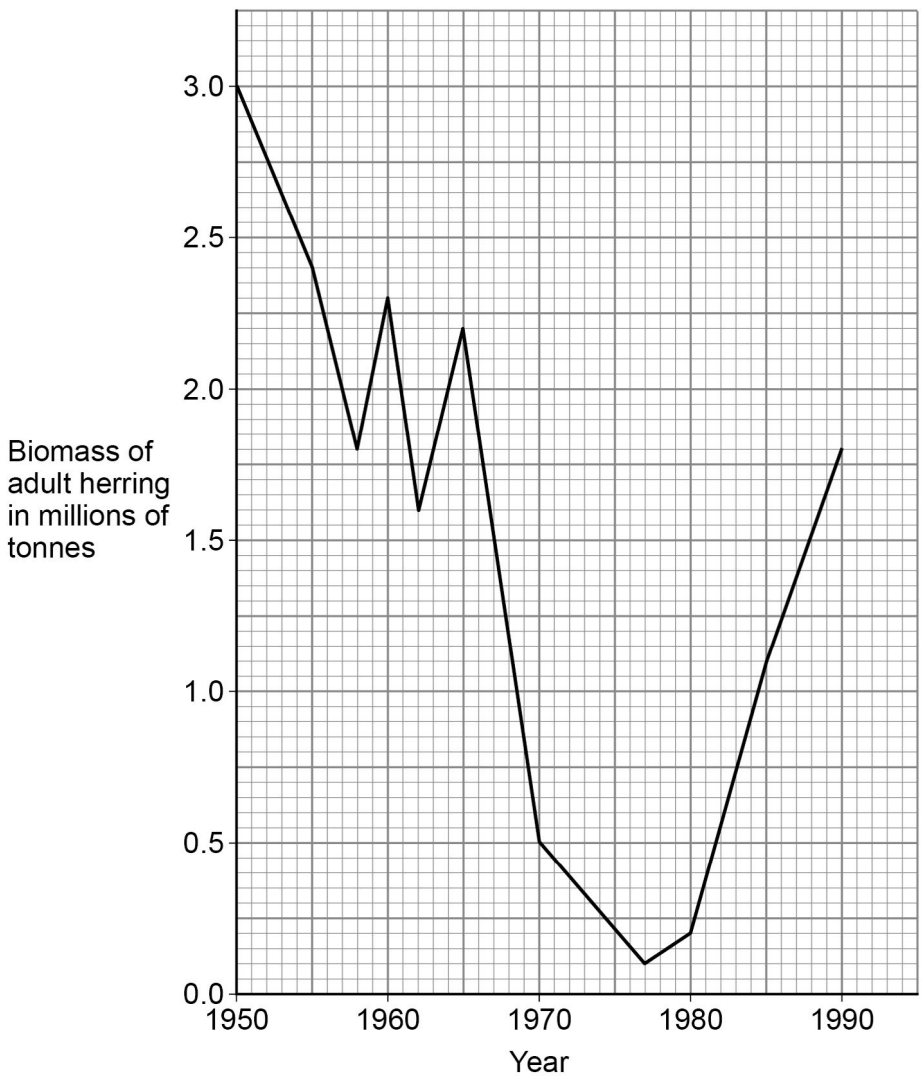
Question 3 continues on the next page

4.7.5.3 Sustainable fisheries

Question 07 · continued

Figure 5 shows the biomass of adult herring in the North Sea between 1950 and 1990.

Figure 5



4.7.5.3 Sustainable fisheries

Question 07 · continued

0 3 . 4 Too many herring were caught in the 1960s.

Calculate the percentage decrease in the biomass of adult herring between 1960 and 1970.

Use the equation:

$$\text{percentage decrease} = \frac{(\text{biomass in 1960} - \text{biomass in 1970})}{\text{biomass in 1960}} \times 100$$

Give your answer to the nearest whole number.

[4 marks]

Percentage decrease = _____ %

From 1977, laws were introduced to help conserve herring.

0 3 . 5 Describe the change in biomass of adult herring from 1977 to 1990.

Use data from **Figure 5** in your answer.

[2 marks]

Question 3 continues on the next page

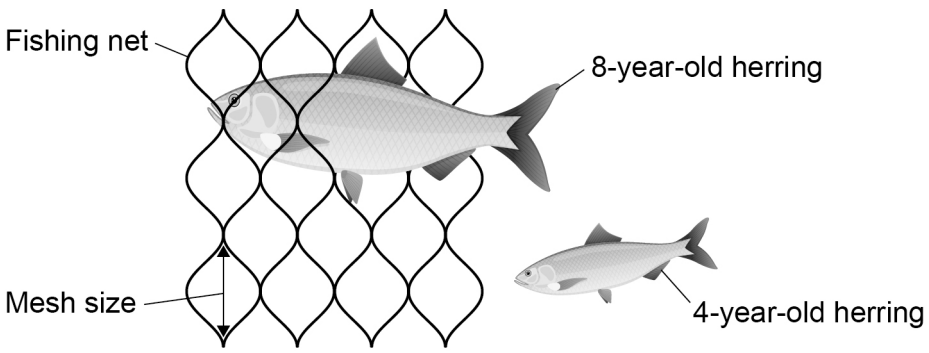
4.7.5.3 Sustainable fisheries

Question 07 · continued

0 3 . 6 One of the laws was to control mesh size of fishing nets.

Figure 6 shows a fishing net with a legal mesh size.

Figure 6



Herring can live for up to 12 years.

Herring start to reproduce when they are 3 to 4 years old.

Explain how the control of mesh size of fishing nets has helped to conserve stocks of herring.

[2 marks]

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