

# GCSE Biology

## Worksheet: Sustainable fisheries

|                       |                          |                              |                                   |
|-----------------------|--------------------------|------------------------------|-----------------------------------|
| TIME<br><b>30 min</b> | TOTAL<br><b>29 marks</b> | CALCULATOR<br><b>Allowed</b> | DIFFICULTY<br><b>Easy, Medium</b> |
|-----------------------|--------------------------|------------------------------|-----------------------------------|

**Topics:** Sustainable fisheries

| NAME | CLASS | DATE |
|------|-------|------|
|------|-------|------|

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

Fish stocks in the oceans are declining.

0 1 . 1

Which **two** measures help to conserve fish stocks at a sustainable level?

Tick (✓) **two** boxes.

Controlling the mesh size of fishing nets

☐

Introducing fishing quotas

☐

Using larger fishing boats

☐

Fishing in areas where fish breed

☐

**[2 marks]**

0 1 . 2

What is a fishing quota?

.....

.....

**[1 mark]**

0 1 . 3

Why is it important to keep fish stocks at a level where breeding continues?

.....

.....

**[1 mark]**

0 2

Scientists tested two fishing nets with different mesh sizes. Table 1 shows the percentage of fish of each length that were caught by each net. This species of fish can breed when it reaches a length of about 35 cm.

Table 1

| Length of fish<br>in cm | Percentage caught by net A<br>(80 mm mesh) | Percentage caught by net B<br>(120 mm mesh) |
|-------------------------|--------------------------------------------|---------------------------------------------|
| 20                      | 85                                         | 5                                           |
| 30                      | 92                                         | 30                                          |
| 40                      | 95                                         | 80                                          |
| 50                      | 96                                         | 94                                          |

0 2 . 1

Which net would be better for conserving the fish stock? Give a reason for your answer.

.....

.....

.....

.....

[2 marks]

0 2 . 2

Suggest why some fishing crews prefer to use net A.

.....

.....

[1 mark]

0 2 . 3

Net B still catches 30% of the fish that are 30 cm long.  
Explain why this is a problem for the fish stock.

.....

.....

.....

.....

[2 marks]

0 3

Scientists advised that no more than 49 000 tonnes of mackerel should be caught in one area of sea next year. This total quota is shared between several countries. Country A is given 20% of the quota.

0 3 . 1

Calculate the mass of mackerel that boats from country A may catch next year.

.....

.....

.....

Mass = ..... tonnes

**[1 mark]**

0 3 . 2

Country A shares its quota equally between 40 fishing boats.  
Calculate the mass of mackerel each boat may catch.

.....

.....

.....

Mass per boat = ..... tonnes

**[1 mark]**

0 3 . 3

Explain why scientists set a lower quota when the stock of mackerel is small.

.....

.....

.....

.....

**[2 marks]**

0 4

Fishing boats in one area changed from nets with small holes to nets with larger holes. Scientists measured the lengths of the fish caught before and after the change. This species of fish can breed only when it is at least 40 cm long. Table 2 shows the results.

Table 2

| Length of fish in cm | Number caught with the old nets | Number caught with the new nets |
|----------------------|---------------------------------|---------------------------------|
| 10–19                | 120                             | 10                              |
| 20–29                | 340                             | 90                              |
| 30–39                | 280                             | 260                             |
| 40–49                | 160                             | 180                             |
| 50–59                | 100                             | 110                             |

0 4 . 1

Calculate the percentage of the fish caught with the old nets that were too small to breed.

.....

.....

.....

.....

Percentage = ..... %

[2 marks]

0 4 . 2

Calculate the same percentage for the new nets. Give your answer to 3 significant figures.

.....

.....

.....

Percentage = ..... %

[1 mark]

0 4 . 3

Explain how the new nets help to conserve the fish stock.

.....

.....

.....

.....

[2 marks]

0 4 . 4

The total catch fell after the change.  
Suggest why the catch may increase again in future years.

.....

.....

[1 mark]

0 5

Scientists advised that no more than 24 000 tonnes of haddock should be caught in one area of sea next year. This total quota is shared between several countries. Country A is given 60% of the quota.

0 5 . 1

Calculate the mass of haddock that boats from country A may catch next year.

.....

.....

.....

Mass = ..... tonnes

[1 mark]

0 5 . 2

Country A shares its quota equally between 40 fishing boats.  
Calculate the mass of haddock each boat may catch.

.....

.....

.....

Mass per boat = ..... tonnes

[1 mark]

0 5 . 3

Explain why scientists set a lower quota when the stock of haddock is small.

---

---

---

---

[2 marks]

0 6

Fishing boats catch fish using large nets.

0 6 . 1

Explain how increasing the mesh size of fishing nets helps to conserve fish stocks.

---

---

---

---

---

---

---

[3 marks]

0 6 . 2

Explain how fishing quotas help to conserve fish stocks.

---

---

---

---

[2 marks]

0 6 . 3

Suggest **one** reason why some people who work in the fishing industry oppose quotas.

---

---

[1 mark]

---

### END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

# Mark scheme

## GCSE Biology · Worksheet: Sustainable fisheries · 29 marks

---

---

### Question 1 (4 marks)

#### 01.1 [2 marks]

**Correct:** Controlling the mesh size of fishing nets; Introducing fishing quotas

---

#### 01.2 [1 mark]

- a limit on the number / mass of fish (of each species) that can be caught (1)
- 

#### 01.3 [1 mark]

- otherwise the population declines and some species may disappear from some areas (1)
- 
- 

### Question 2 (5 marks)

#### 02.1 [2 marks]

- net B (1)
  - it catches far fewer small / young fish that have not yet bred (e.g. 5% of 20 cm fish compared with 85%) (1)
- 

#### 02.2 [1 mark]

- it catches more fish (of all sizes), so a bigger catch / more income (1)
- 

#### 02.3 [2 marks]

- 30 cm fish are too small to breed (below 35 cm) (1)
  - so they are removed before they reproduce, reducing the future stock (1)
-

---

### Question 3 (4 marks)

#### 03.1 [1 mark]

**Answer:** 9800 tonnes

- $49\,000 \times 0.2 = 9800$  (tonnes) (1)

---

#### 03.2 [1 mark]

**Answer:** 245 tonnes

- $9800 \div 40 = 245$  (tonnes) (1)

**Notes:** Allow ECF from the previous part.

---

#### 03.3 [2 marks]

- so that enough fish are left to breed (1)
- so that the stock can recover / is kept at a level where breeding continues, and the fish do not disappear from the area (1)

---

### Question 4 (6 marks)

#### 04.1 [2 marks]

**Answer:** 74%

- $120 + 340 + 280 = 740$ , out of a total of 1000 (1)
- $740 \div 1000 \times 100 = 74$  (%) (1)

---

#### 04.2 [1 mark]

**Answer:** 55.4%

- $(10 + 90 + 260) \div 650 \times 100 = 55.4$  (%) (1)

**Notes:** An answer of 55.38 (not given to 3 significant figures) scores 0 marks.

---

#### 04.3 [2 marks]

- more small / young fish escape through the larger holes (1)
- so more fish survive to reach breeding size and breed, so the stock is maintained (1)

---

#### 04.4 [1 mark]

- more fish survive to breed, so the stock increases and more (larger) fish are available to catch (1)
-

---

## Question 5 (4 marks)

### 05.1 [1 mark]

**Answer:** 14 400 tonnes

- $24\,000 \times 0.6 = 14\,400$  (tonnes) (1)

---

### 05.2 [1 mark]

**Answer:** 360 tonnes

- $14\,400 \div 40 = 360$  (tonnes) (1)

**Notes:** Allow ECF from the previous part.

---

### 05.3 [2 marks]

- so that enough fish are left to breed (1)
- so that the stock can recover / is kept at a level where breeding continues, and the fish do not disappear from the area (1)

---

## Question 6 (6 marks)

### 06.1 [3 marks]

- larger holes let smaller / younger fish escape (1)
- so these fish survive to reach breeding age and breed (1)
- so the population is replaced / maintained (1)

---

### 06.2 [2 marks]

- they limit the number / mass of fish caught (1)
- so enough fish survive to breed / fish are not removed faster than they are replaced (1)

---

### 06.3 [1 mark]

- they catch fewer fish, so earn less money (1)
- jobs may be lost (1)
- fish caught over the quota may be thrown back dead (wasted) (1)

Any 1 of the points above.

---