

GCSE Biology

Worksheet: Trophic levels

TIME 35 min	TOTAL 31 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Trophic levels

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

A food chain on a rocky shore is:

seaweed → periwinkle → crab → herring gull

0 1 . 1

Table 1

Organism	Trophic level	Name of feeding group
seaweed	1	producer
periwinkle		
crab	3	
herring gull		tertiary consumer

Complete Table 1.

.....

.....

.....

.....

.....

.....

.....

.....

[4 marks]

0 1 . 2

Herring gulls have no predators on this shore.
What name is given to a carnivore with no predators?

.....

.....

.....

.....
[1 mark]

0 2

Feeding relationships in an ecosystem can be described using trophic levels.

0 2 . 1

How do decomposers break down dead plant and animal matter?

Tick (✓) **one** box.

By secreting enzymes into the environment

☐

By photosynthesis

☐

By taking in whole dead cells

☐

By making glucose from carbon dioxide

☐

[1 mark]

0 2 . 2

In the food chain grass → rabbit → fox, which organism is at trophic level 3?

Tick (✓) **one** box.

Grass

☐

Rabbit

☐

Fox

☐

The Sun

☐

[1 mark]

0 2 . 3

Herbivores eat plants and algae.

What name is given to herbivores in a food chain?

Tick (✓) **one** box.

Producers

☐

Primary consumers

☐

Secondary consumers

☐

Apex predators

☐

[1 mark]

0 2 . 4

Name the substance that plants and algae make by photosynthesis, which they use to make other molecules.

.....

.....

.....

[1 mark]

0 3

Organisms in an ecosystem can be placed into trophic levels.

0 3 . 1

Which trophic level do plants and algae belong to?

Tick (✓) **one** box.

Level 1

☐

Level 2

☐

Level 3

☐

Level 4

☐

[1 mark]

0 3 . 2

What name is given to the organisms at trophic level 2?

.....

.....

.....

[1 mark]

0 3 . 3

What name is given to carnivores that eat other carnivores?

.....

.....

.....

[1 mark]

0 3 . 4

What is an apex predator?

.....

.....

[1 mark]

0 4

In the Arctic Ocean:

- phytoplankton are single-celled algae
- zooplankton are small animals that eat phytoplankton
- Arctic cod eat zooplankton
- ringed seals eat Arctic cod
- polar bears eat ringed seals.

0 4 . 1

Use the information to write a food chain.

.....

.....

[1 mark]

0 4 . 2

Give the trophic level of the ringed seal.

.....

.....

.....

Trophic level =

[1 mark]

0 4 . 3

Explain why the phytoplankton are at trophic level 1.

.....

.....

[1 mark]

0 4 . 4

Which organism in this food chain is an apex predator? Give a reason for your answer.

.....

.....

[1 mark]

0 4 . 5

Polar bears sometimes feed on the bodies of dead whales. The whales feed on zooplankton.
Suggest why this makes it difficult to give the polar bear a single trophic level.

.....

.....

[1 mark]

0 5

A student grew a fungus on agar jelly containing starch. After 3 days, the student poured iodine solution over the agar. The agar turned blue-black, except for a clear zone around the fungus. The clear zone was wider than the fungus itself.

0 5 . 1

Explain why there was a clear zone around the fungus.

.....

.....

.....

.....

[2 marks]

0 5 . 2

Explain why the clear zone was wider than the fungus.

.....

.....

[1 mark]

0 5 . 3

Describe how the fungus absorbs the products of this digestion.

.....

.....

[1 mark]

0 5 . 4

The clear zone had a diameter of 34 mm.

Calculate its area. Use the equation: $\text{area} = \pi r^2$

Give your answer to 3 significant figures.

.....

.....

.....

.....

Area = mm²

[2 marks]

0 6

Decomposers break down dead plant and animal matter.

0 6 . 1

Describe how decomposers break down dead matter and obtain their food.

.....

.....

.....

.....

.....

.....

[3 marks]

0 6 . 2

Name **two** groups of microorganisms that act as decomposers.

.....

.....

.....

.....

[2 marks]

0 6 . 3

Explain why decomposers are important in an ecosystem.

.....

.....

.....

.....

[2 marks]

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: Trophic levels · 31 marks

Question 1 (5 marks)

01.1 [4 marks]

Answer: periwinkle: 2, primary consumer; crab: secondary consumer; herring gull: 4

- periwinkle: trophic level 2 (1)
 - periwinkle: primary consumer / herbivore (1)
 - crab: secondary consumer (1)
 - herring gull: trophic level 4 (1)
-

01.2 [1 mark]

Answer: Apex predator

- apex predator (1)
-
-

Question 2 (4 marks)

02.1 [1 mark]

Correct: By secreting enzymes into the environment

02.2 [1 mark]

Correct: Fox

02.3 [1 mark]

Correct: Primary consumers

02.4 [1 mark]

Answer: Glucose

- glucose (1)
-

Question 3 (4 marks)

03.1 [1 mark]

Correct: Level 1

03.2 [1 mark]

Answer: Primary consumers (herbivores)

- primary consumers / herbivores (1)
-

03.3 [1 mark]

Answer: Tertiary consumers

- tertiary consumers (1)
-

03.4 [1 mark]

Answer: A carnivore with no predators

- a carnivore that has no predators (1)
-

Question 4 (5 marks)

04.1 [1 mark]

Answer: phytoplankton → zooplankton → Arctic cod → ringed seal → polar bear

- phytoplankton → zooplankton → Arctic cod → ringed seal → polar bear (1)

Notes: The arrows must point towards the organism that is doing the eating.

04.2 [1 mark]

Answer: 4

- 4 (1)
-

04.3 [1 mark]

- they make their own food by photosynthesis, so they are producers (1)
-

04.4 [1 mark]

Answer: Polar bear

- polar bear, because it is a carnivore with no predators (1)
-

04.5 [1 mark]

- the polar bear then feeds at a different trophic level (level 4 instead of level 5), so it feeds at more than one trophic level (1)
-

Question 5 (6 marks)

05.1 [2 marks]

- the fungus secreted enzymes (carbohydrases / amylase) into the agar (1)
- the enzymes broke down the starch into sugars, so there was no starch to turn the iodine blue-black (1)

05.2 [1 mark]

- the enzymes diffused through the agar, away from the fungus (1)

05.3 [1 mark]

- the small soluble (sugar) molecules diffuse into the cells of the fungus (1)

05.4 [2 marks]

Answer: 908 mm²

- $r = 17$ (mm) (1)
- 908 (mm²) (1)

Notes: An answer of 907.9 (not given to 3 significant figures) scores 1 mark. An answer of 3630 (diameter used as the radius) scores 1 mark.

Question 6 (7 marks)

06.1 [3 marks]

- they secrete enzymes into the environment / onto the dead matter (1)
- the enzymes break down large molecules into small soluble food molecules (1)
- the small soluble molecules diffuse into the decomposer (microorganism) (1)

06.2 [2 marks]

- bacteria (1)
- fungi (1)

06.3 [2 marks]

- they return carbon to the atmosphere as carbon dioxide (from respiration) (1)
 - they return mineral ions to the soil, which plants can take up (1)
-