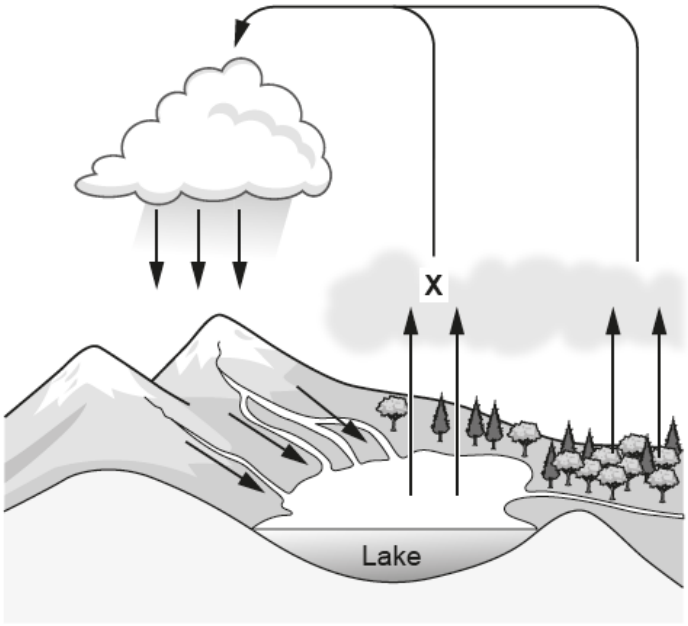
Community level systems – 2021/20 GCSE Gateway Biology A

1. Nov 2021/Paper_J247/02/No.1

The diagram shows the water cycle.



Which process is **X**?

A Evaporation

B Precipitation

C Run-off

D Transpiration

Your answer ☐ **[1]**

2. Nov 2021/Paper_J247/02/No.3

Which process causes the **loss** of biomass from food chains?

A Growth

B Photosynthesis

C Predation

D Respiration

Your answer ☐ **[1]**

3. Nov 2021/Paper_J247/02/No.4

Tigers hunt and kill deer to eat.

Which is the correct description of this relationship?

A Competition

B Mutualism

C Parasitism

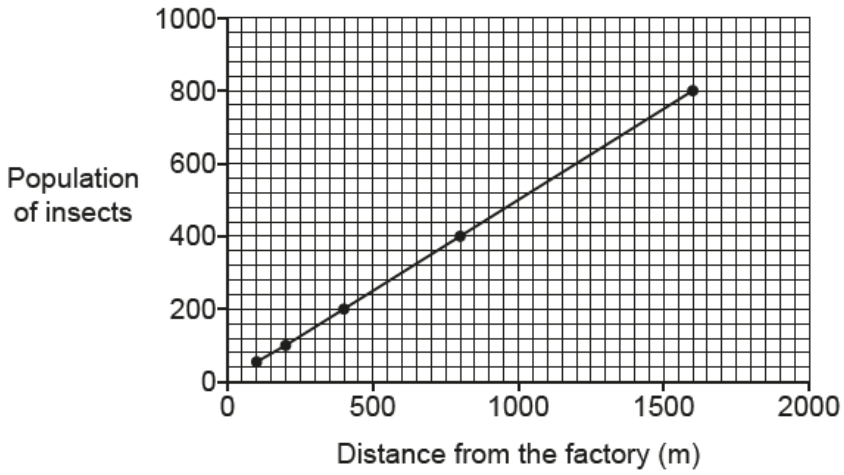
D Predation

Your answer ☐ **[1]**

4. Nov 2021/Paper_J247/02/No.15

A student estimated the population of insects at different distances from a factory using capture-recapture.

They plotted their results on a graph.



Which of these statements describes the student's results?

A Population size = distance from the factory

B Population size ∝ distance from the factory

C Population size > distance from the factory

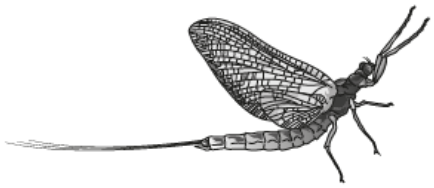
D Population size ~ distance from the factory

Your answer ☐ **[1]**

5. Nov 2021/Paper_J247/02/No.16

The drawings show two types of insect called the Blandford fly and the mayfly.

Blandford fly



Mayfly

(a) The young of both Blandford flies and mayflies live in rivers and eat algae.

Large fish called trout eat the young of both Blandford flies and mayflies.

(i) Complete the sentences about the river and the organisms.

You can use each word once, more than once, or not at all.

community **ecosystem** **habitat** **population**

The river is a ..... where organisms live.

All the trout in the river are a ..... .

[2]

(ii) Draw lines to connect each organism with its correct trophic level.

	Primary consumers
Mayfly	Producers
Trout	Secondary consumers
	Tertiary consumers

[2]

(iii) What process in algae produces food for the organisms in the river?

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

(b) Adult Blandford flies often bite people and feed by sucking up blood. Before they start feeding, they inject proteins into the skin.

These proteins have two actions:

- preventing platelets from working
- numbing the skin, temporarily taking away feeling in the area.

Suggest how each of these actions may help the fly.

Preventing platelets from working .....

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Numbing the skin .....

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[3]

(c) After the fly has finished feeding, the person has an immune response against the proteins.

The list shows some stages in the immune response.

A Antibodies are released.

B Antibodies attach to the proteins.

C Enzymes digest the proteins inside the white blood cells.

D White blood cells engulf the proteins.

E White blood cells gather at the site.

Write these stages in the **correct order** in the boxes.

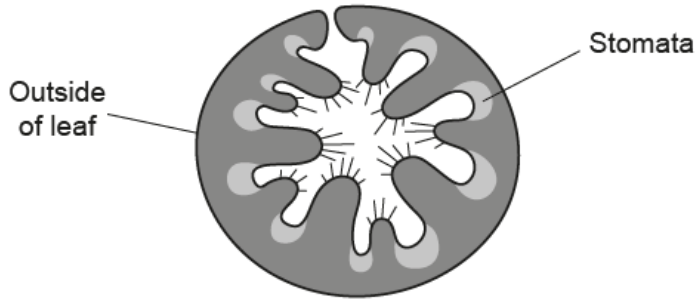
The first one has been done for you.

E				

[3]

6. Nov 2020/Paper_J247/01/No.13

Marram grass grows on sand dunes with very little water available. It has a leaf that is curled in on itself so that the stomata are hidden on the inside, as shown in the diagram.



Why does this adaptation help the plant to survive on sand dunes?

A Increases gas exchange from the stomata.

B Reduces air movement around the stomata.

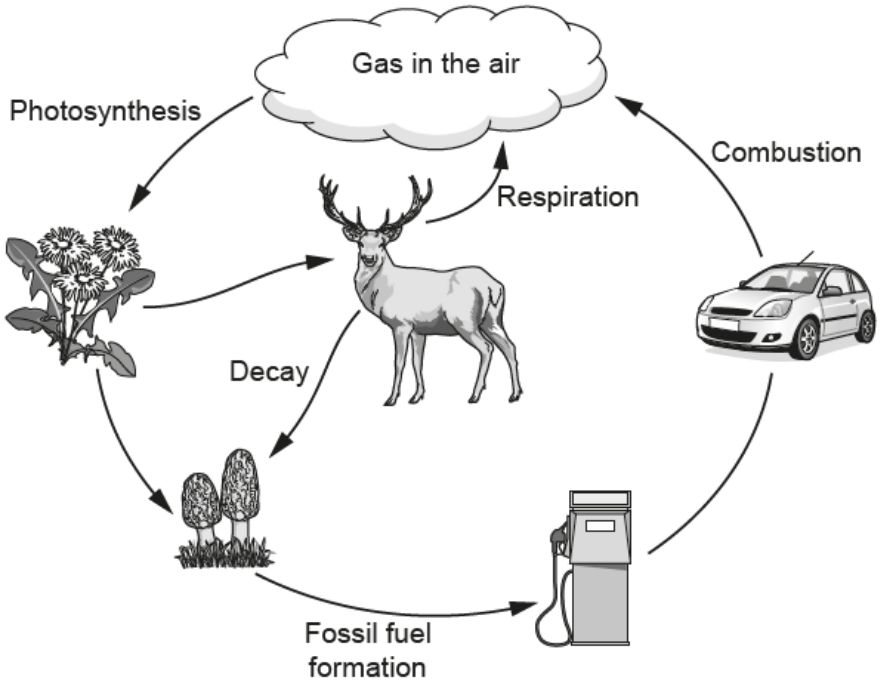
C Increases photosynthesis by the leaf.

D Increases water uptake by the leaf.

Your answer ☐ **[1]**

7. Nov 2020/Paper_J247/02/No.1

The diagram shows part of a cycle in an ecosystem.



What is the name of the cycle shown in the diagram?

A Carbon cycle

B Hydrogen cycle

C Nitrogen cycle

D Sulfur cycle

Your answer ☐ **[1]**

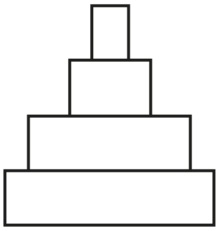
8. Nov 2020/Paper_J247/02/No.4

This is a food chain for organisms in a forest.

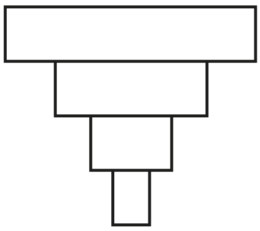
Oak tree → Greenfly → Ladybird → Blackbird

Which is the correct shape for a pyramid of **biomass** for this food chain?

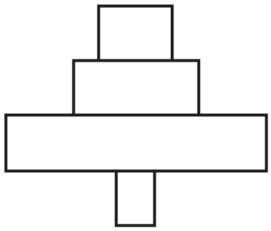
A



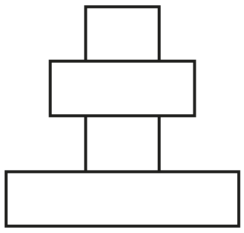
B



C



D



Your answer ☐ **[1]**

9. Nov 2020/Paper_J247/02/No.5

Seedbanks store many types of seed for long periods of time.

Why were seedbanks set up?

A To act as a store of biodiversity.

B To be used to feed animals if food is short.

C To store pathogens for future use.

D To supply seeds to farmers at a cheaper cost.

Your answer ☐ **[1]**

10. Nov 2020/Paper_J247/02/No.16

Fig. 16.1 shows a plant that grows in South America called stevia.

Fig. 16.1

(a) **Fig. 16.2** shows a food web containing stevia.

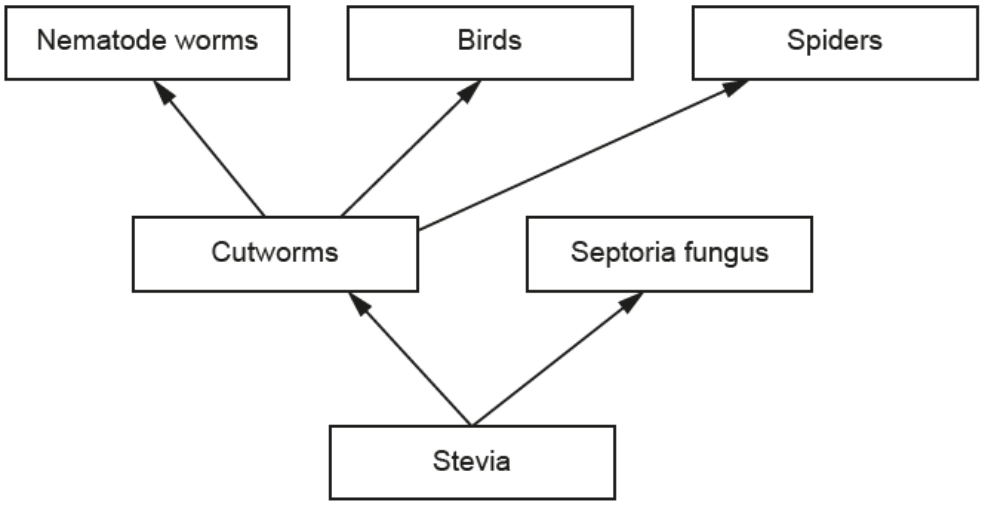


Fig. 16.2

(i) Write down the number of trophic levels in this food web.

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

(ii) What is the source of energy for this food web?

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

(iii) Septoria fungus is a parasite of stevia.

Explain what is meant by the term **parasite**.

.....

.....

..... **[2]**

(b) The leaves of stevia taste very sweet. People are now trying to grow stevia as a crop.

Stevia farmers often add nematode worms to their fields.

Explain why farmers do this.

Use **Fig. 16.2** in your answer.

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.....

.....

..... **[3]**

(c) A chemical in the stevia leaves makes them taste sweet. This chemical is **not** a sugar. People with diabetes need to know if the food they eat contains sugar.

(i) Describe how you could test some stevia leaves to prove that they do **not** contain sugar.

Reagent used .....

Method .....

.....

Expected result .....

..... **[3]**

(ii) Will using stevia in foods help people with type 2 diabetes?

Explain your answer.

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.....

..... **[2]**

11. Nov 2020/Paper_J247/02/No.22

Fig. 22.1 shows the water cycle occurring in a lake.

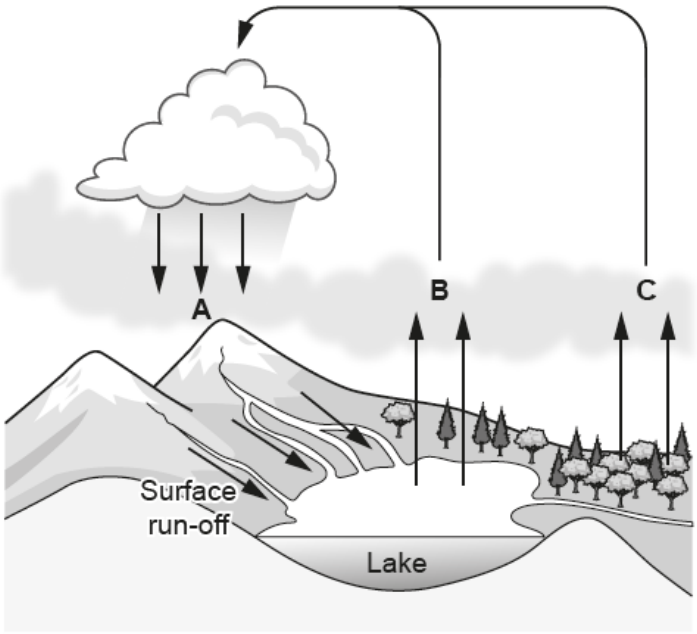

Fig. 22.1

(a) Draw a line to the correct name for the three processes labelled **A**, **B** and **C** in **Fig. 22.1**.

A	Evaporation
	Photosynthesis
B	Precipitation
	Respiration
C	Translocation
	Transpiration

[3]

(b) Surface run-off water passes through soil and back into the lake.

Write down **one** reason why surface run-off water is important to organisms living in the lake.

.....

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

(c) Scientists investigate antibiotic pollution in two different lakes.

They collect samples of water from the two lakes. The scientists then use aseptic techniques to investigate how resistant the bacteria in the water are to antibiotics. **Fig. 22.2** shows the apparatus they use.

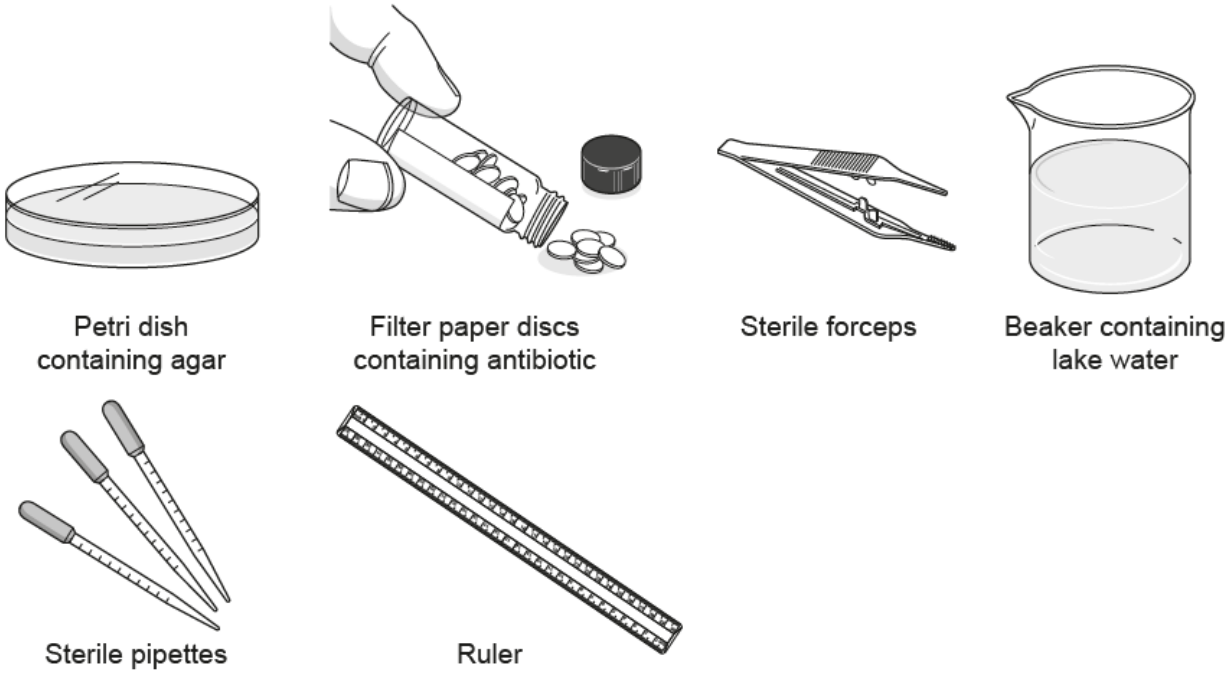

Fig. 22.2

Describe how the scientists could use **this** apparatus to **measure** how resistant the bacteria are to antibiotics.

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..... **[4]**

(d) The scientists also counted how many species of bacteria were resistant to antibiotics and how many species of bacteria were killed by antibiotics.

The scientists found these results.

	Number of different species of bacteria	
	In Lake Bellandur	In Lake Jakkur
Resistant to antibiotics	53	35
Killed by antibiotics	28	37

Which lake has the **highest** levels of antibiotic pollution?

Tick (✓) **one** box.

Lake Bellandur ☐

Lake Jakkur ☐

Explain your answer.

.....

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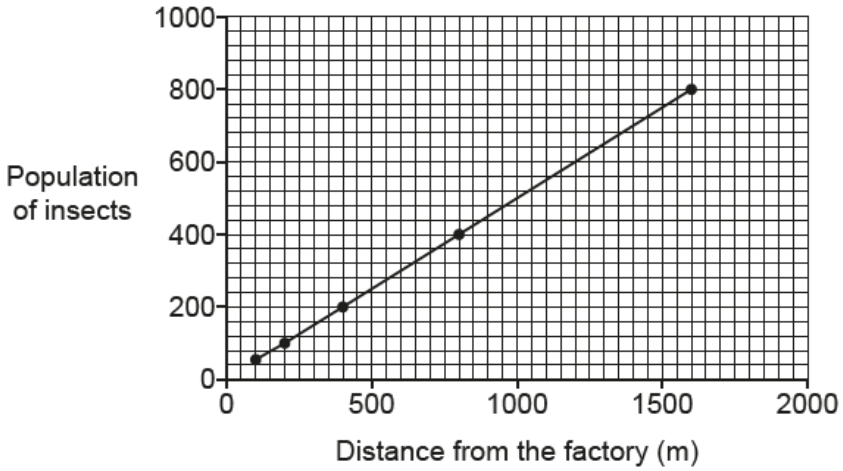
.....

..... **[2]**

12. Nov 2021/Paper_J247/04/No.1

A student estimated the population of insects at different distances from a factory using capture-recapture.

They plotted their results on a graph.



Which of these statements describes the student's results?

A Population size = distance from the factory

B Population size ∝ distance from the factory

C Population size > distance from the factory

D Population size ~ distance from the factory

Your answer ☐ **[1]**

13. Nov 2021/Paper_J247/04/No.2

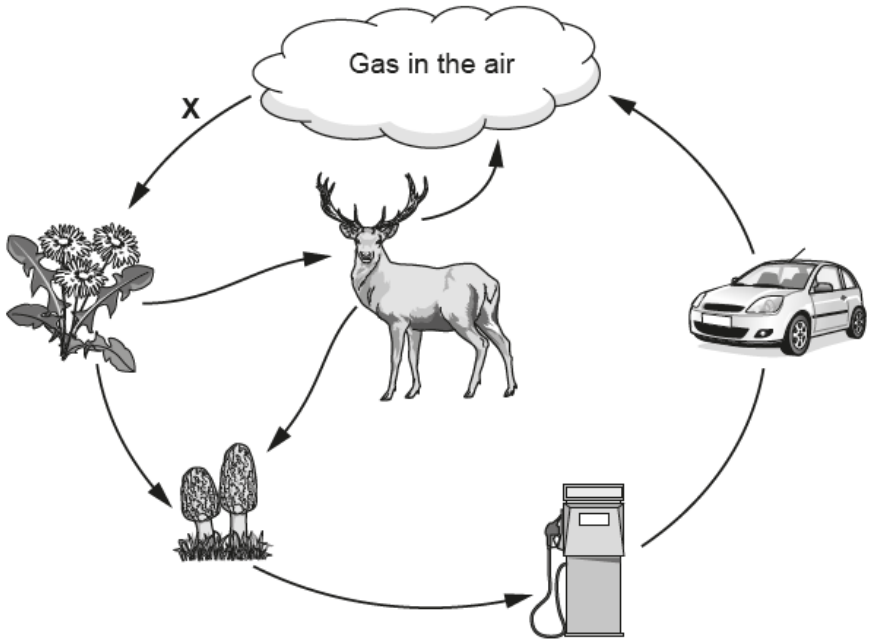
Which row in the table gives the optimum conditions for decomposition?

	Oxygen	Temperature (°C)	Decomposers
A	Present	40	Present
B	Absent	10	Absent
C	Present	80	Present
D	Absent	40	Present

Your answer ☐ **[1]**

14. Nov 2021/Paper_J247/04/No.3

The diagram shows the carbon cycle.



What is the importance of process **X** to living organisms?

A It produces food containing carbon molecules.

B It produces fossil fuels for combustion.

C It provides minerals to plants.

D It releases energy and carbon dioxide.

Your answer ☐ **[1]**

15. Nov 2021/Paper_J247/04/No.4

The diagram shows the biomass in different trophic levels of a food chain.

Oak tree 1000 kg → Greenfly 10 kg → Ladybirds 1 kg

Which processes account for the decrease of biomass along the food chain?

A Egestion, growth and respiration

B Egestion, respiration and excretion

C Photosynthesis, respiration and excretion

D Respiration, growth and excretion

Your answer ☐ **[1]**

16. Nov 2020/Paper_J247/03/No.2

Anaesthetics used during operations slow down breathing and heart rate.

Which part of the brain do anaesthetics act on to do this?

A Cerebrum

B Cerebellum

C Medulla

D Pituitary

Your answer ☐ **[1]**

17. Nov 2020/Paper_J247/04/No.3

Which is the correct definition of a parasite?

A An organism that is always at the top of a food chain.

B An organism that kills and eats another organism.

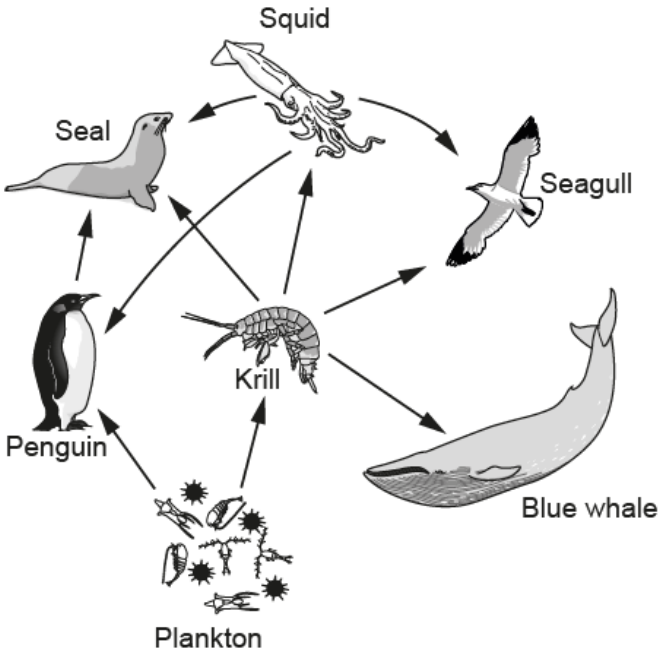
C An organism that lives on another living organism so that they both benefit.

D An organism that lives on or in another living organism causing it harm.

Your answer ☐ **[1]**

18. Nov 2020/Paper_J247/04/No.4

The diagram shows a food web in the sea.



Not to scale

The number of penguins decreased in the area. This caused an increase in seal numbers.

What is a possible reason for the increase in seal numbers?

A Less seals were eaten.

B The krill numbers dropped.

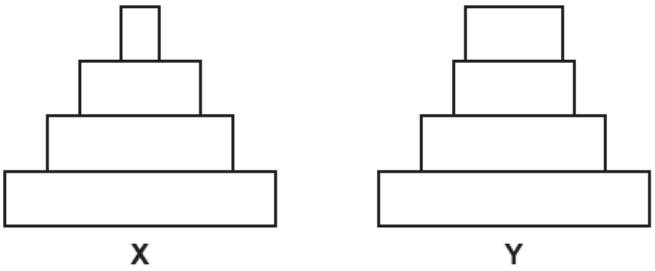
C There were more plankton for the seals to eat.

D The seals had less competition for squid.

Your answer ☐ **[1]**

19. Nov 2020/Paper_J247/04/No.14

The diagram shows pyramids of biomass for two food webs, **X** and **Y**.



X **Y**

Which statement explains the difference between the two pyramids?

A In food web **X** there is a greater efficiency of transfer between primary consumer and secondary consumer than in **Y**.

B In food web **X** there is a greater efficiency of transfer between secondary consumer and tertiary consumer than in **Y**.

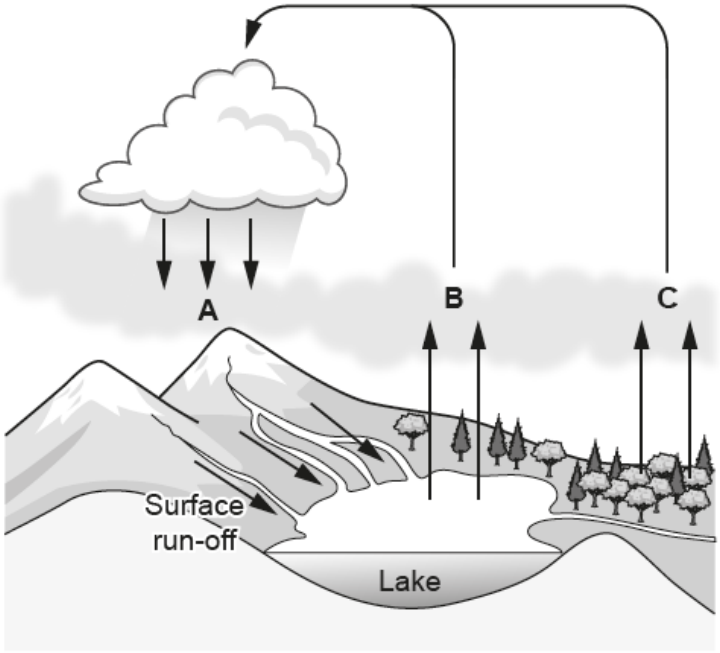
C In food web **X** there is a lower efficiency of transfer between primary consumer and secondary consumer than in **Y**.

D In food web **X** there is a lower efficiency of transfer between secondary consumer and tertiary consumer than in **Y**.

Your answer ☐ **[1]**

20. Nov 2020/Paper_J247/04/No.16

Fig. 16.1 shows the water cycle occurring in a lake.



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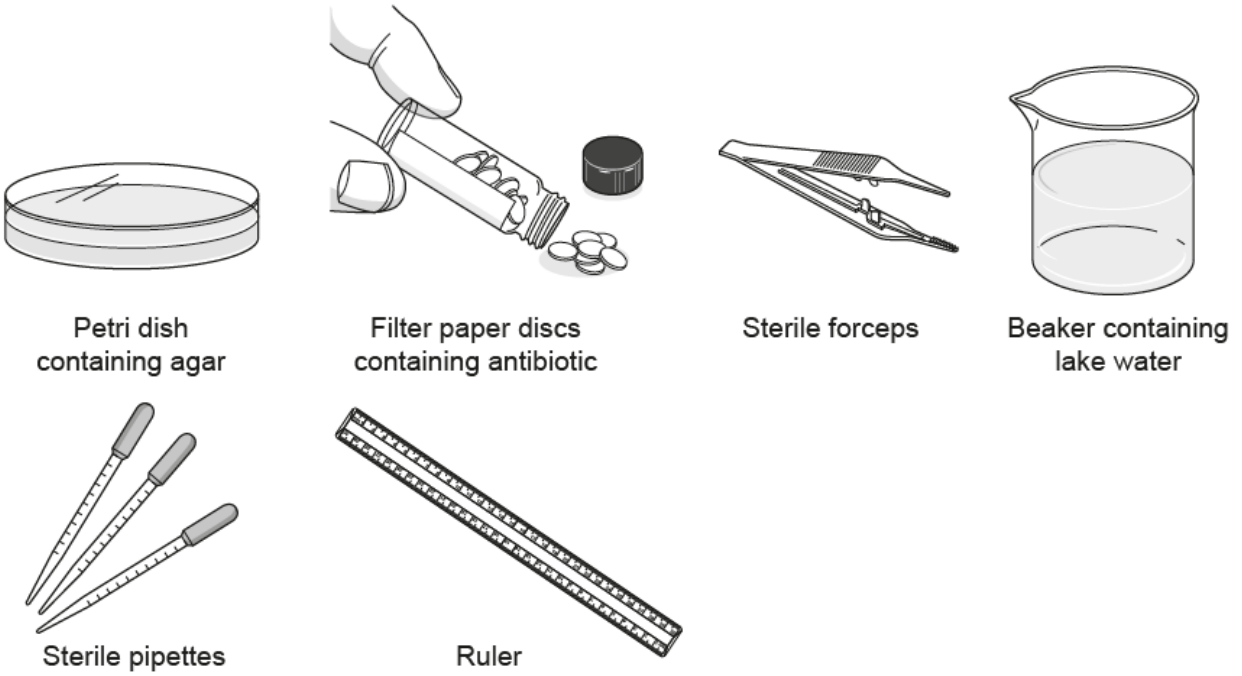

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Lake Jakkur ☐

Explain your answer.

.....

.....

.....

..... **[2]**