bio letters

Biology
Standard and Higher level
C4.2 Transfer of energy and matter
Paper 1A

12 May 2025

Zone A afternoon | **Zone B** morning | **Zone C** afternoon

2 hours 30 minutes [Paper 1A]

Instructions to candidates

- Answer all questions.
- For each question, choose the answer you consider to be the best.
- A calculator is required for this paper.
- This paper generally presents questions in the same order the concepts are presented in the syllabus guide. The earlier questions are usually but not always easier than the later questions. Although most questions focus on this topic only, some are linked to other topics.
- This paper contains challenging IB-style problems. It is meant to enrich your learning and improve your mastery of the concepts presented in this topic after you have studied it.
- Many of the questions here are original and written by me. Several questions are taken from external sources, which are referenced at the end of the paper. None of the questions are from IB past papers.
- The duration of this paper was scaled according to the number of marks available and based on how much time, on average, each mark is worth in examination settings. Since this is a practice paper, expect to need more time to complete it.
- The maximum mark for this paper 1A is **[100 marks]**.

1205–2025

38 pages

1. What is an ecosystem?

A. An open system of interacting biotic and abiotic elements

B. An open system of interacting biotic elements

C. A closed system of interacting biotic and abiotic elements

D. A closed system of interacting biotic elements

2. A limestone cave system has two distinct chambers: chamber A receives occasional leaf litter and carcasses washed in by floods, and chamber B is entirely isolated and does not receive organic input. Which option about primary production in each chamber is true?

	Chamber A	**Chamber B**
A.	Chemoautotrophic bacteria	Chemoautotrophic bacteria
B.	Chemoautotrophic archaea	Decomposers
C.	Decomposers	Chemoautotrophic archaea
D.	Decomposers	Decomposers

3. A student simulates deep sea hydrothermal ecosystems by adding archaea to a water tank rich in hydrogen, carbon dioxide, and minerals. If the tank is sealed and placed in the dark, which statement is correct?

A. The tank is a closed system

B. The tank is an open system

C. The tank is an isolated system

D. The tank is a semi-closed system

4. Which of the following is not a consequence of sunlight being the primary source of energy in most ecosystems?

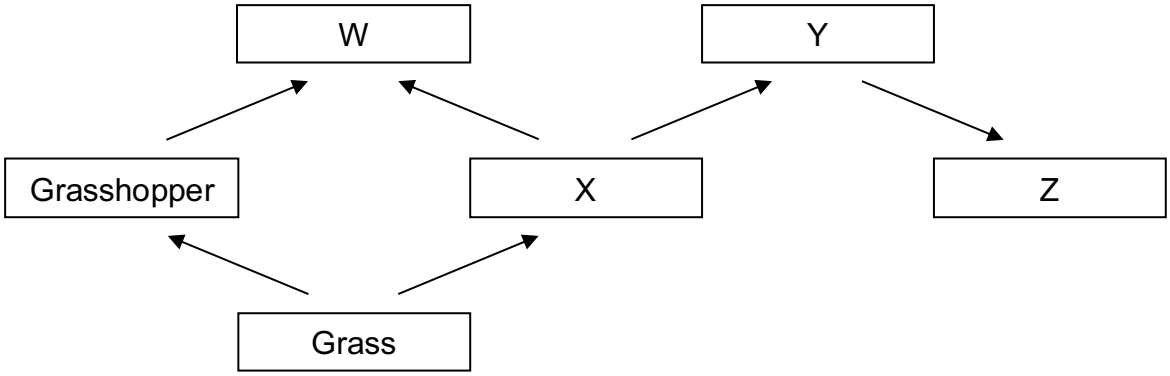
A. Evaporation

B. Transpiration

C. Ecosystem sustainability

D. Heat loss

Use this food web to answer questions **5** – **7**.



5. Which organism(s) represent(s) an herbivore?

A. W

B. X

C. W, X, Y

D. W, Y

6. Which organism(s) represent(s) a secondary consumer?

A. W, Y, Z

B. W, Y

C. X

D. Z

7. Which organism occupies the highest trophic level?

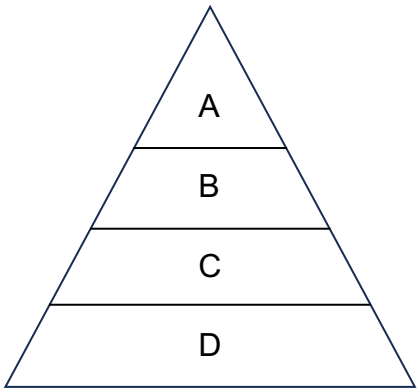
A. X

B. W

C. Y

D. Z

8. What is true of this energy pyramid?



A. The biomass of level D is less than the biomass of level B

B. Energy enters the pyramid through level A first and level D last

C. Biomass decreases from D to A

D. The biomass is identical in all levels

9. A model predicts stable predator-prey dynamics in a forest. In real life, the prey population collapses after a storm introduces invasive species. What does this reveal about the model?

A. Model fails to consider energy flow in food webs

B. Model fails to consider energy limits of trophic levels

C. Model fails to consider inputs of matter into the ecosystem

D. Model fails to consider inputs of energy into the ecosystem

10. What is the successive flow of energy through a series of organisms?

I. Food chain

II. Food web

III. Energy flow

A. I only

B. I and II only

C. II and III only

D. I, II, and III

Use this food chain to answer questions **11** and **12**.

11. Which organisms are needed to keep this food chain self-sustaining?

A. Deer and mountain lions

B. Sunlight and deer

C. Sunlight and plants

D. Deer and plants

12. Which statement correctly describes energy flow in this food chain?

A. The leaves capture all the sunlight through photosynthesis

B. The deer store all the energy they receive from leaves

C. The deer stores only about 1 in every 10 calories it eats

D. The mountain lion stores only about 1 in every 100 calories it eats

13. A tertiary consumer receives 25 kJ of energy from its prey. If 10% of energy is transferred to each trophic level, what is the minimum amount of energy stored in the primary producer?

A. 250

B. 2500

C. 25000

D. 250000

14. A student observes that nutrient-rich lakes tend to support more algal biomass than nutrient-poor ones and generalizes that “primary productivity is limited by nutrient availability.” Why is this a useful generalization?

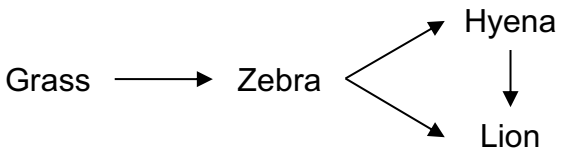
A. It provides a useful rule of thumb that applies to most ecosystems

B. It takes into consideration the factors limiting biomass

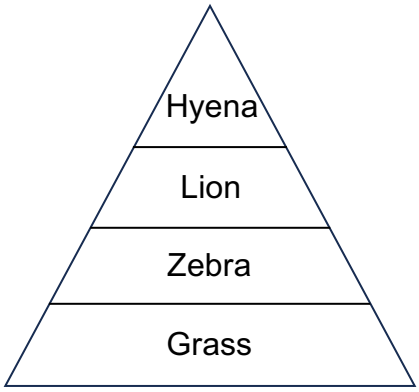
C. It generalizes based on a widely applicable limiting factor

D. It focuses on primary productivity which is the foundation of all ecosystems

15. Which food pyramid correctly represents the relationships in the food web?



A.



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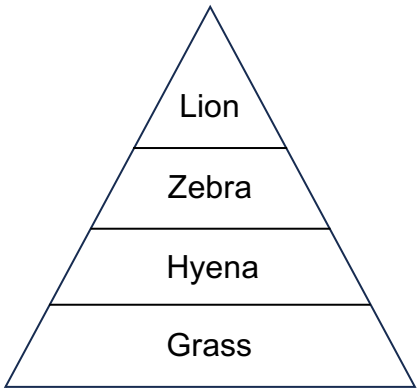
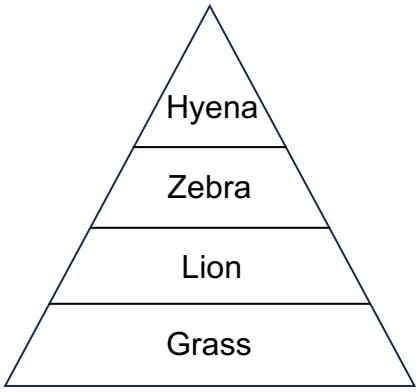
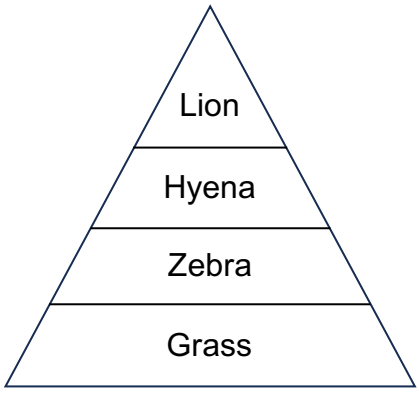


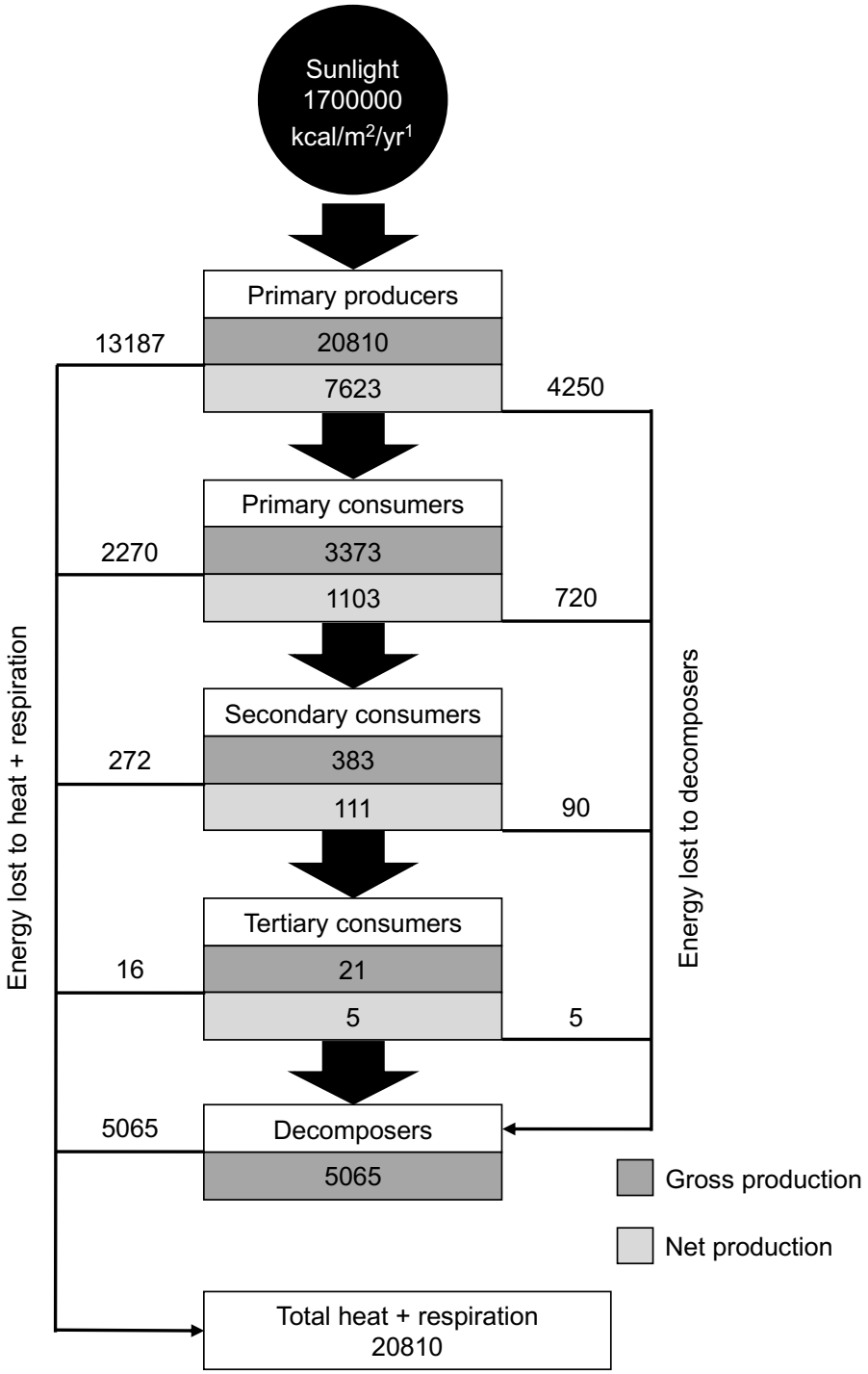
C.



D.



Energy flow in a spring ecosystem in Silver Springs, Florida, is shown. Use this to answer questions **16** – **18**.



16. Why is the total energy of biomolecules produced by primary producers equal to the total amount of energy released through heat and respiration?

A. Energy not eaten by herbivores is released as heat or decomposed

B. Energy is not created, destroyed, or changed in ecosystems

C. Energy is released by decomposers to complete energy and matter transfer

D. Energy captured by the sun is all eventually released as heat

17. Why is the total energy of the sun not incorporated into trophic levels?

A. Energy transfer is inefficient between trophic levels

B. Primary producers use most of the sun energy to produce sugars

C. Primary producers do not convert all solar energy to chemical energy

D. Most solar energy is heat that cannot be used by primary producers

18. Which trophic level has the highest percentage loss of energy due to heat and respiration?

A. Primary producers

B. Primary consumers

C. Secondary consumers

D. Tertiary consumers

19. Why does doubling primary producer biomass not double the amount of energy available to herbivores?

A. Herbivore populations are regulated by density-dependent factors

B. Fraction of energy available to herbivores is limited

C. Secondary production increases with higher biomass

D. Primary producer biomass eventually drops to the natural carrying capacity

20. Why would adding a fifth trophic level to a food chain cause it to collapse?

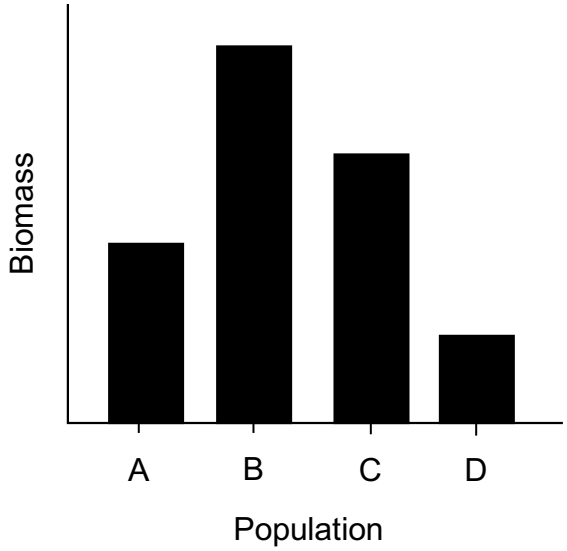
A. Primary production is too low

B. Primary production is too high

C. Secondary production is too low

D. Secondary production is too high

21. The bar graph shows the biomass of four different populations of a particular food pyramid. Which option correctly matches each population to its trophic level?



	A	**B**	**C**	**D**
A.	2	3	4	1
B.	2	1	3	4
C.	4	2	3	1
D.	3	1	2	4

22. How is heat lost in cells?

A. When ATP is produced only

B. When ATP is used only

C. When ATP is produced and used

D. When organisms respire only

23. What must be true if secondary production is highly variable in an ecosystem?

A. Primary production is also variable

B. Primary production is constant

C. Metabolic rates in herbivores are constant

D. Metabolic rates in herbivores are also variable

24. A student is collecting data about an ecosystem and uses primary production as an estimate for energy that is passed to herbivores. How would this affect their study?

A. Overestimation of primary production

B. Underestimation of primary production

C. Overestimation of secondary production

D. Underestimation of secondary production

25. After a natural disaster, the tertiary trophic level collapses even though primary and secondary production recover quickly. A disruption to which process may lead to this?

A. Ingestion

B. Digestion

C. Absorption

D. Assimilation

26. What must be true if primary production in a solar-dependent ecosystem equals primary production in detritus-dependent ecosystems?

A. Decomposition rates are equal to photosynthesis rates

B. Photosynthesis rates are relatively lower than in typical ecosystems

C. Energy loss is equal in both ecosystems

D. Secondary production is equal in both ecosystems

27. Which of the following can decrease secondary production?

I. Allelopathy

II. Inefficient assimilation

III. High producer to consumer biomass ratio

A. I only

B. I and II only

C. I and III only

D. I, II, and III

28. In a grassland ecosystem where primary production increases, what is most likely to occur in herbivore populations?

A. Carrying capacity increases

B. Carrying capacity decreases

C. Birth rates increase

D. Birth rates decrease

29. An ecologist is gathering data on an ecosystem and finds that secondary production increases despite primary production remaining unchanged. What could have caused this change?

A. Immigration increased

B. Energy content per unit mass increased

C. Secondary consumer biomass increased

D. Tertiary consumer biomass increased

30. What effect would high primary production have on the diversity of an ecosystem?

A. Increases biodiversity

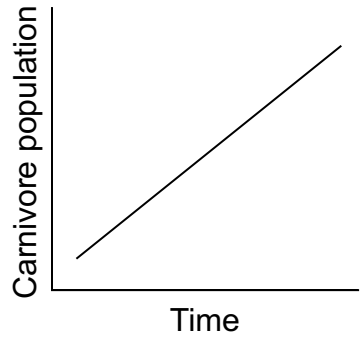
B. Increases genetic diversity only

C. It depends on biotic and abiotic factors

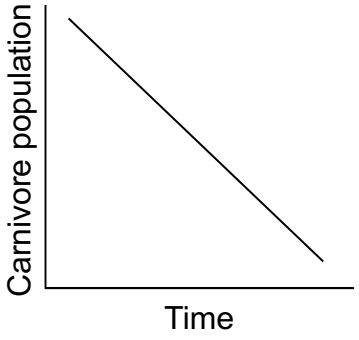
D. Increases species diversity only

31. Which graph correctly shows the immediate effect of a sudden collapse in secondary production on carnivores?

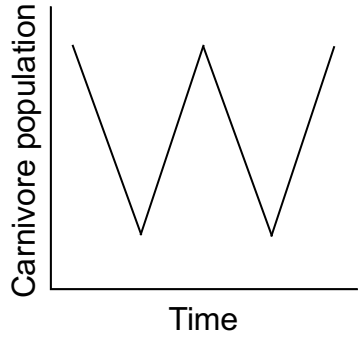
A.



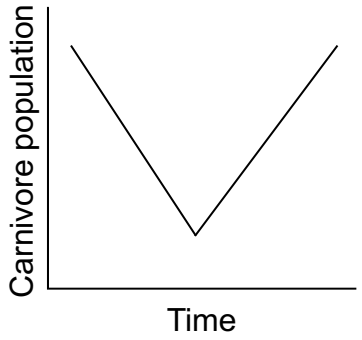
B.



C.



D.



32. A lake experiences rapid increases in primary production but secondary production is relatively unchanged. Which is going to most likely be observed?

A. More trophic levels

B. Gradual increase in secondary production

C. Reduced nutrient availability for decomposers

D. Algal blooms

33. A population of the freshwater herbivore *Daphnia pulex* carries a point mutation in the gene encoding the enzyme that digests ß-glucose monomers, preventing it from being expressed. How would secondary production be affected?

A. Decreases due to lower cell respiration

B. Decreases due to a reduced ability in incorporating food into metabolism

C. Decreases due to increased compensatory production of the enzyme

D. Decreases due to a reduction in carrying capacity

34. An ecologist studying two grassland sites finds that both sites have equal primary production, but site A has twice the herbivore biomass as that of site B. What factor should the ecologist investigate first?

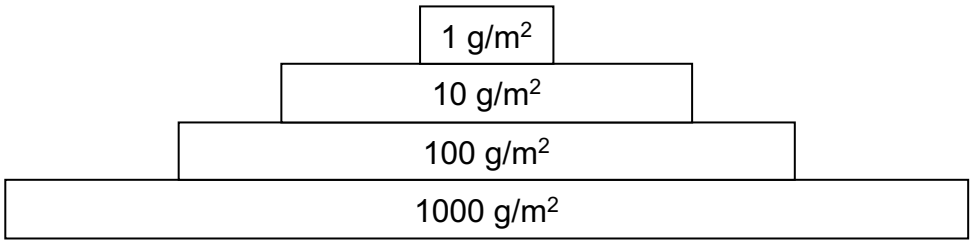
A. Carnivore assimilation

B. Omnivore assimilation

C. Herbivore assimilation

D. Plant assimilation

35. The pyramid shows the approximate dry mass of organisms at each trophic level in a forest ecosystem. Which of the following best predicts the effect of an increase in the primary producers' exposure to sunlight?



A. The biomass at all trophic levels will increase

B. The biomass at all trophic levels will decrease

C. The biomass of primary producers and primary consumers will decrease, but the biomass of secondary and tertiary consumers will remain the same

D. Only the biomass of primary producers will increase

Use this table to answer questions **36** – **38**.

Animals in a community	Food consumed				
	Shrews	Aphids	Hawks	Snakes	Plants
Shrews		X			
Hawks	X			X	
Aphids					X
Spiders		X			
Snakes	X				

36. Which organism(s) is/are a primary consumer?

A. Aphids only

B. Aphids and shrews

C. Spiders only

D. Spiders and snakes

37. Which organisms compete for the same food supply?

I. Hawks and snakes

II. Shrews and aphids

III. Spiders and shews

A. I only

B. I and II only

C. I and III only

D. I, II, and III

38. Which organism has the highest biomass?

A. Hawks

B. Plants

C. Snakes

D. Aphids

39. Which of the following is not cycled in an ecosystem?

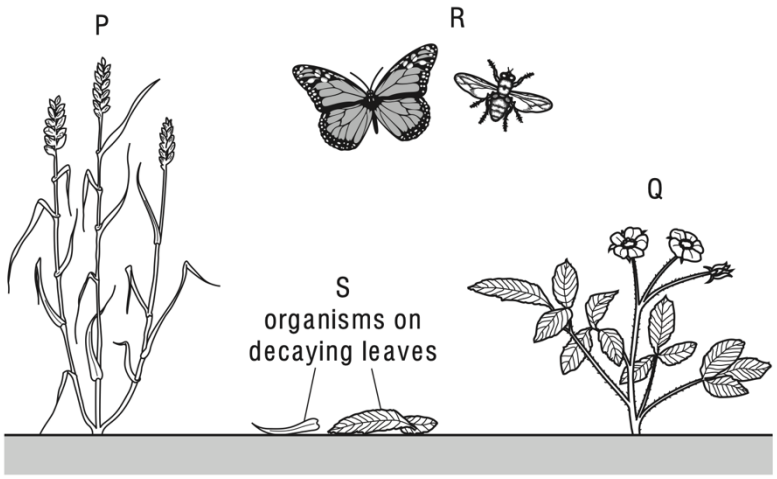
A. Water

B. Nitrogen

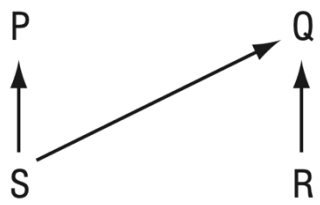
C. Carbon

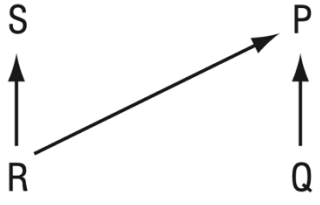
D. Energy

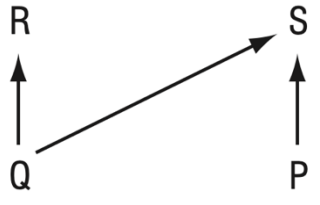
40. The diagram shows organisms in a habitat.

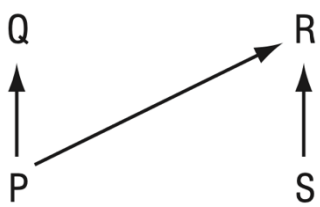


Which option shows the feeding relationship of these organisms?

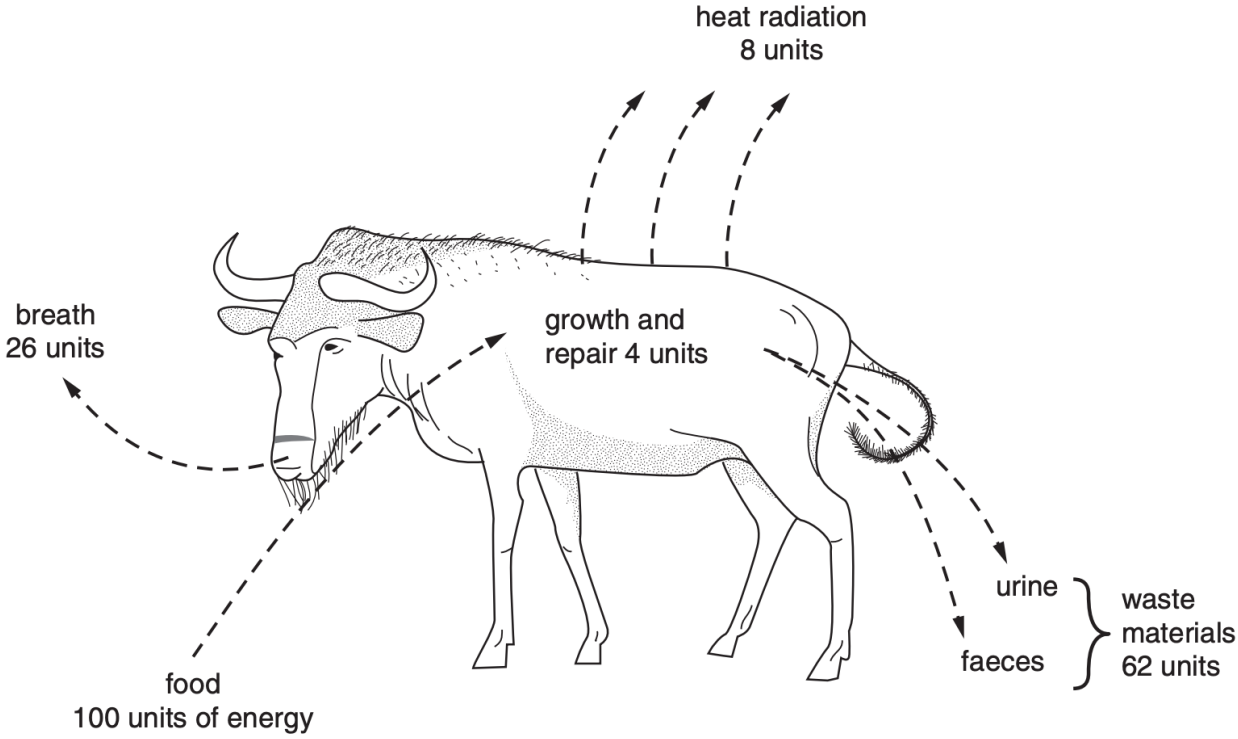
A.


B.


C.


D.


41. The diagram shows how energy from food is used by a wildebeest. What percentage of energy is available to decomposers and consumers?



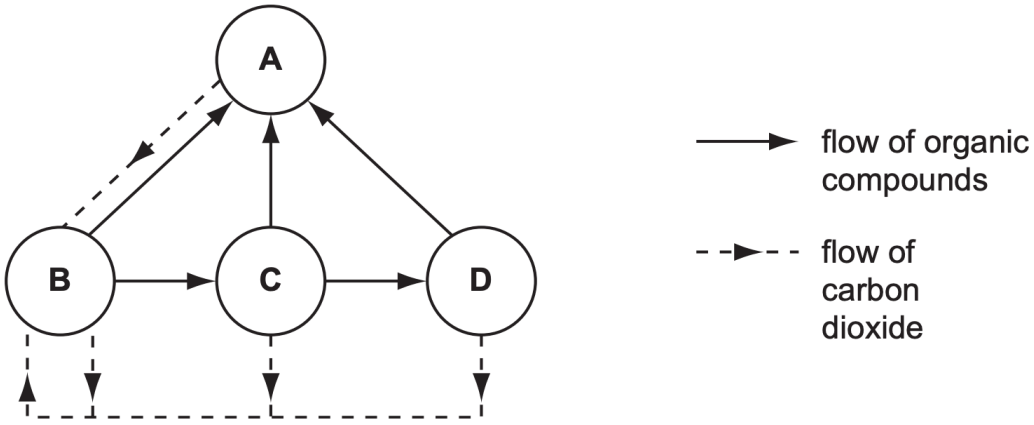
A. 100

B. 96

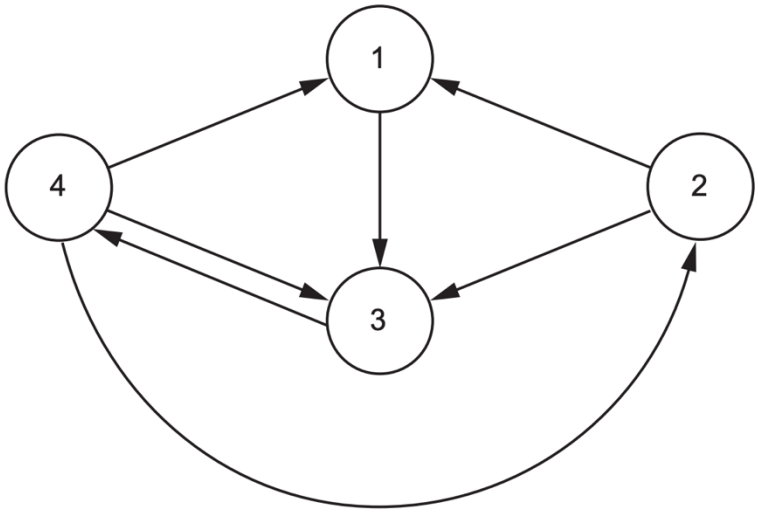
C. 12

D. 4

42. The diagram shows the flow of substances within an ecosystem. The circles represent trophic levels. Which circle represents herbivores?

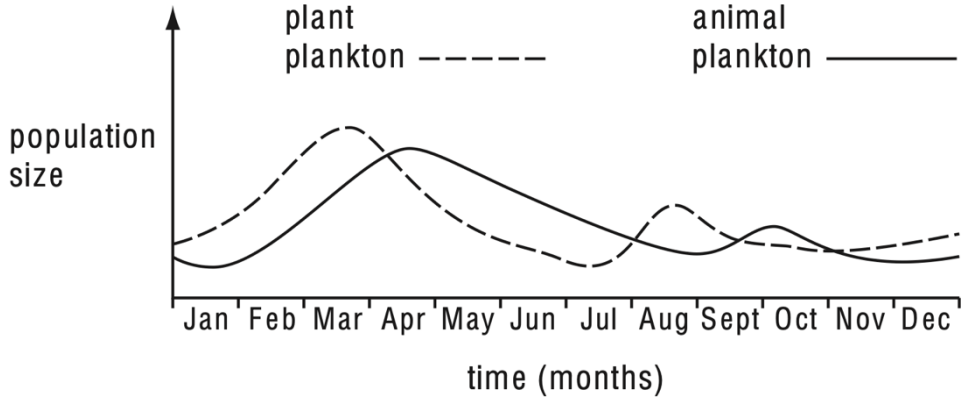


43. In the diagram, arrows represent the movements of carbon compounds in the carbon cycle. The circles represent carbon compounds in animals, decomposers, plants and the atmosphere. Which is represented by each circle?



	1	2	3	4
A.	animals	decomposers	plants	atmosphere
B.	atmosphere	plants	decomposers	animals
C.	decomposers	animals	atmosphere	plants
D.	plants	atmosphere	animals	decomposers

44. The graph shows the changes in population over time of plant and animal plankton in a lake. A student states that "population changes in animal plankton lag behind similar changes in plant plankton because the animals feed on the plants." What is a correct evaluation of their statement?



A. It is a reasonable interpretation of the data

B. It is a restatement of the data not an interpretation

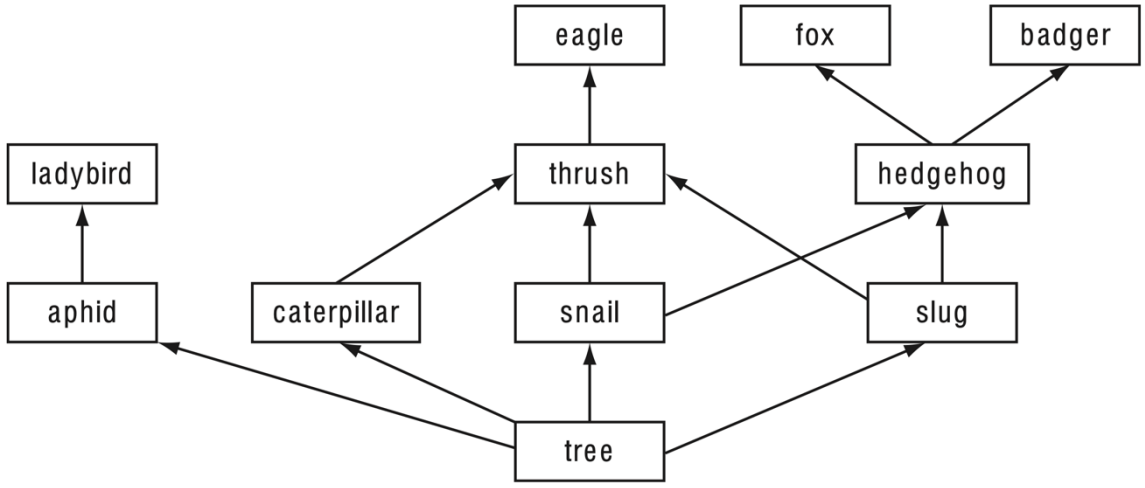
C. It is not supported by the data

D. More data is required for this interpretation to be made

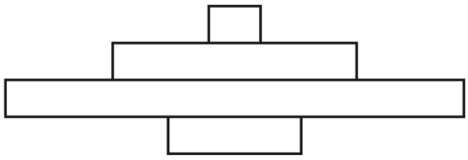
45. What is a possible sequence for energy flowing through a food web?

	lost as heat	present in glucose	present in protein	recycled for photosynthesis
A.	–	2	1	3
B.	1	–	3	2
C.	2	3	–	1
D.	3	1	2	–

46. The diagram shows a food web. Which option is a pyramid of numbers based on this food web?



A.



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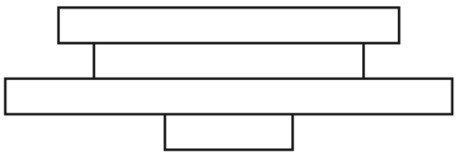
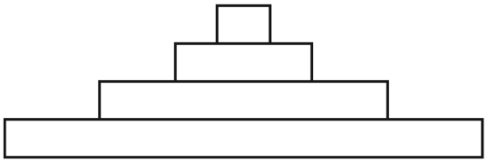
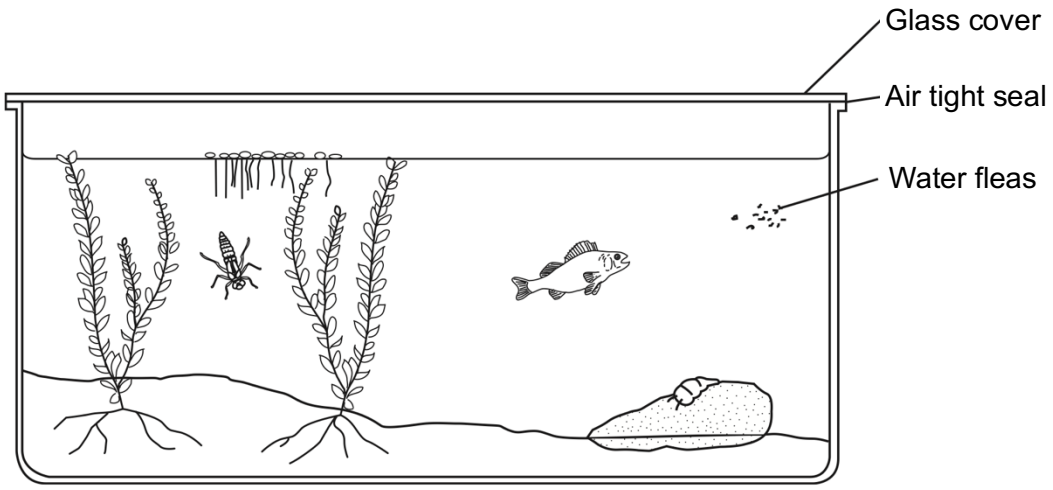


C.



D.

47. The diagram shows some animals and green plants sealed in an aquarium. What must be supplied to keep the organisms alive for the longest possible time?



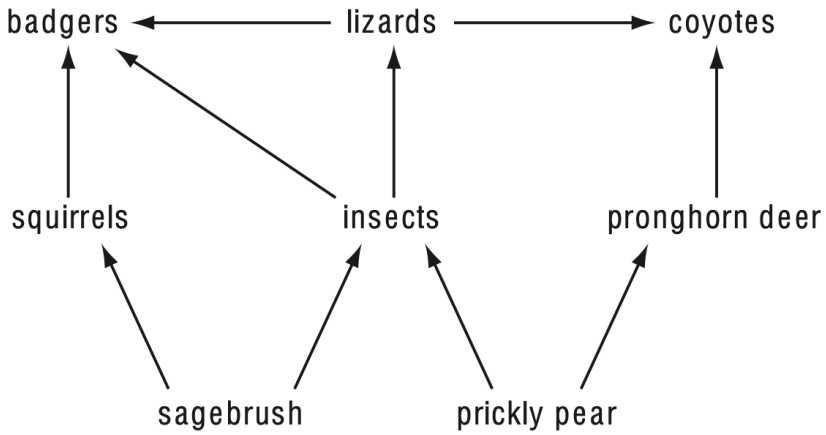
A. carbon dioxide

B. light

C. fertilizer

D. oxygen

48. If the population of insects decreases in this food web, which other population will decrease the most?



A. badgers

B. lizards

C. sagebrush

D. squirrels

49. Which statement is correct?

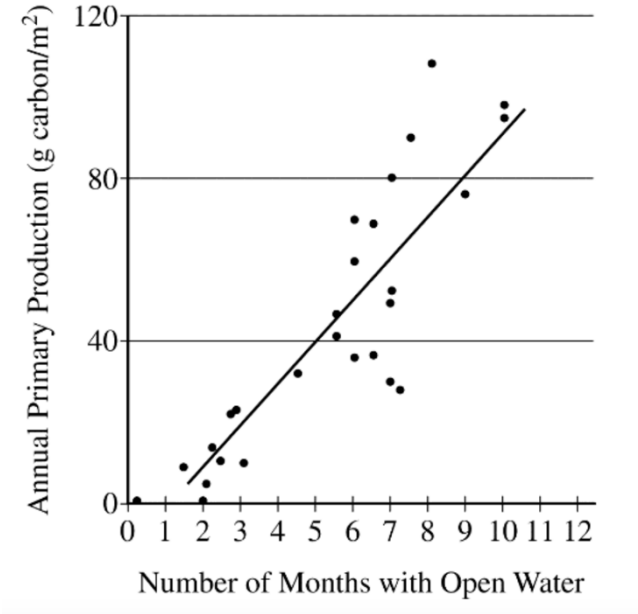
A. Energy flow is unidirectional

B. Energy flow is bidirectional

C. Energy flow is multidirectional

D. Energy flow directionality depends on the ecosystem

50. Phytoplankton are primary producers in the Artic Ocean. They are consumed by zooplankton, which in turn are eaten by codfish. In years when there is more open water (less ice coverage), there are more zooplankton and fish than in years with less open water (more ice coverage). Based on the graph, the difference is most likely because of what?



A. When there is less open water, light is blocked from the zooplankton, so they cannot produce as much food for the fish

B. When there is more open water, the temperature is warmer, so the zooplankton and fish populations increase in size

C. The ice blocks the light, so in years with more ice coverage, there is less photosynthesis by the phytoplankton

D. The ice increases the light available for photosynthesis, so primary production increases and zooplankton populations increase in size

51. Why are decomposers important to ecosystems?

A. They convert large molecules into simpler molecules that can then be recycled

B. They release heat from large molecules so that the heat can be recycled through the ecosystem

C. They can take in carbon dioxide and convert it into oxygen

D. They convert molecules of dead organisms into permanent biotic parts of an ecosystem

52. Two forests have identical gross primary production but one has 25% lower net primary production. What most likely differs between them?

A. Autotroph respiration

B. Heterotroph respiration

C. Photosynthesis rates

D. Decomposition rates

53. An ecologist finds that agricultural expansion in a forest region increased net primary production but also increased soil CO_2 efflux by an even larger margin. What is the region going to function as?

A. Net carbon sink

B. Net carbon source

C. Alternate between source and sink

D. Net zero

54. What might happen when CO_2 enters plants?

I. It becomes part of plant DNA

II. It becomes part of an herbivore

III. It becomes part of the soil

A. I only

B. I and II only

C. I and III only

D. I, II, and III

55. Which statement is correct?

A. Only plants release energy

B. Only animals release energy

C. Plants and animals release energy

D. Only decomposers release energy

56. How do iron-oxidizing bacteria produce energy?

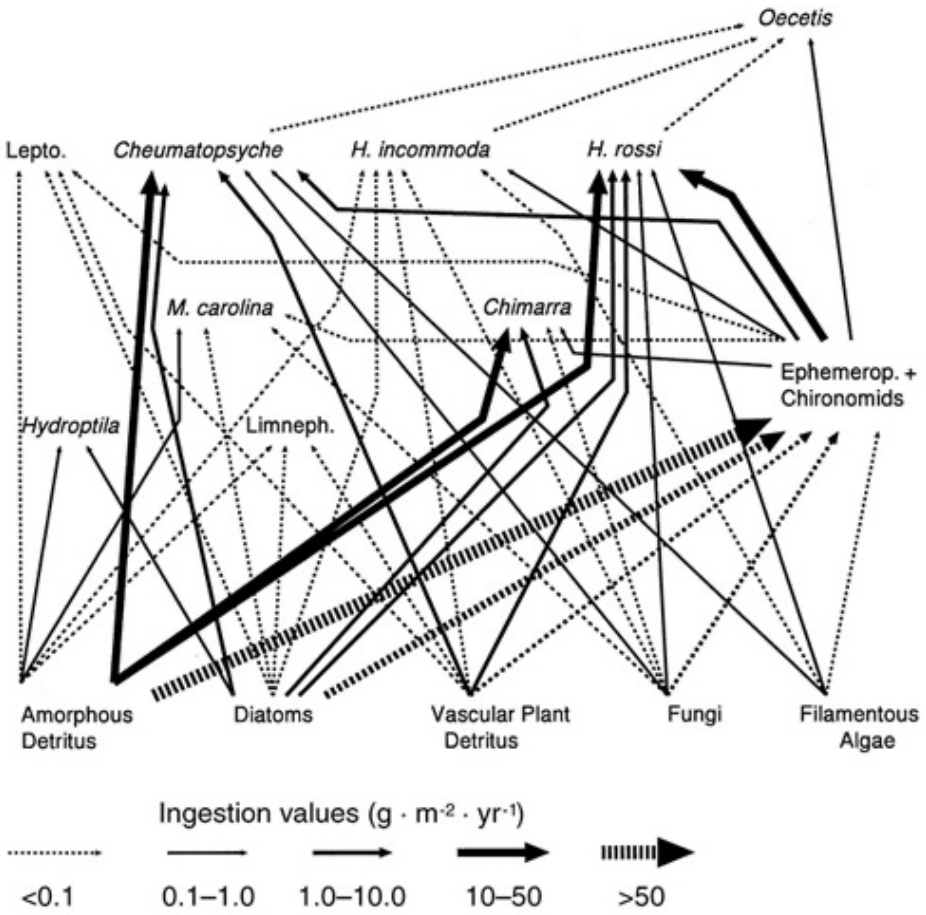
A. Convert iron (II) to iron (III)

B. Convert iron (III) to iron (II)

C. Convert electrons to energy

D. Convert energy to electrons

The diagram shows the food web for the major caddisfly taxa on a submerged wood habitat in a river. Line thickness indicates magnitude of ingestion flows (g m^{-2} y^{-1}). Use this diagram to answer questions **57** – **60**.



57. What are ingestion values indicators of?

A. Amount of energy received by the previous trophic level

B. Amount of energy available for the next trophic level

C. Secondary production

D. Primary production

58. If Amorphous Detritus populations suddenly collapsed, which taxon would be most affected?

A. *H. rossi*

B. *Chimarra*

C. Ephemerop. + Chironomids

D. *Cheumatopsyche*

59. If filamentous algae were removed, which taxon would be least affected?

A. *H. incommoda*

B. *Chimarra*

C. Lepto.

D. Ephemerop. + Chironomids

60. Which consumer exhibits the broadest diet?

A. *Cheumatopsyche*

B. *M. carolina*

C. *Hydroptila*

D. *Oecetis*

61. What is the most direct way that the carbon in starch stored in cereal grain can return to the atmosphere as carbon dioxide?

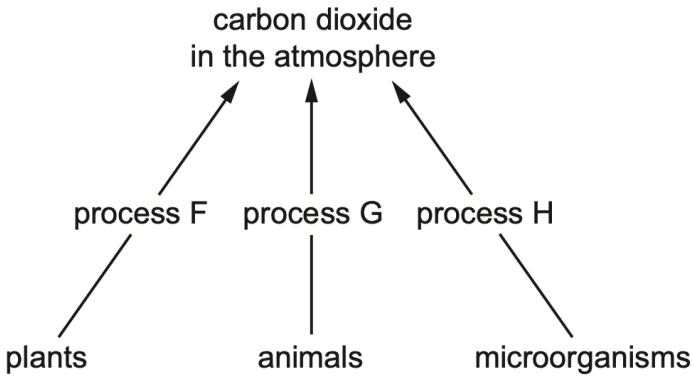
A. Grain is destroyed by fire during storage

B. Grain is eaten by birds

C. Grain is made into bread and eaten by humans

D. Grain stored in damp conditions grows mold and decays

62. The diagram shows some stages of the carbon cycle. What are processes F, G, and H?



	F	G	H
A.	photosynthesis	respiration	photosynthesis
B.	photosynthesis	respiration	respiration
C.	respiration	respiration	respiration
D.	respiration	photosynthesis	photosynthesis

63. What does the long-term upward trend in the Keeling curve indicate?

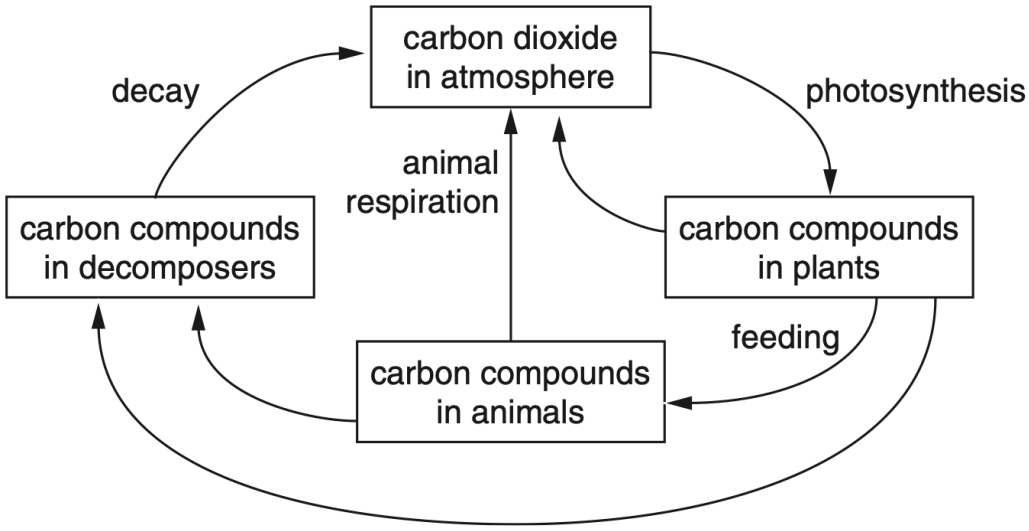
A. Declining carbon sink capacity

B. Fossil fuels causing sink-source imbalance

C. Weakening of carbon removal from oceans and atmosphere

D. Anthropogenic CO_2 outpacing natural sinks

64. The diagram shows part of the carbon cycle. Which process converts most carbon from one form to the other?



A. animal respiration

B. decay

C. feeding

D. photosynthesis

65. Which processes occur during the carbon cycle?

	carbon compounds absorbed by living organisms	carbon compounds excreted by living organisms
A.	yes	yes
B.	yes	no
C.	no	yes
D.	no	no

66. What explains the seasonal fluctuations in the Keeling curve?

A. Seasonal volcanic eruptions

B. Seasonal fluctuations in economic activity

C. Seasonal primary production fluctuations

D. Seasonal ocean absorption fluctuations

67. If global deforestation rates rise, how would this affect the Keeling curve?

A. Upwards shift across the entire curve

B. Seasonal increases in CO_2 would be steeper

C. Upwards shift across half of the curve

D. Seasonal increases in CO_2 would be more frequent

68. What contributes to the decreases of CO_2 levels in the Keeling curve?

A. Reduced global industrial activity during the summer months due to higher energy efficiency

B. Increased photosynthetic activity of terrestrial plants

C. Enhanced oceanic absorption of CO_2 due to seasonal cooling of surface waters

D. Natural soil carbon sequestration becoming more efficient during warm months

69. How does the Keeling curve support the anthropogenic theory of climate change?

A. By showing that human activities have always caused high CO_2

B. By showing that recent human activities caused high CO_2

C. By showing that natural and human activities caused high CO_2

D. By showing that mostly human and some natural activities caused high CO_2

70. Why was the Mauna Loa observatory chosen?

A. It is near a dense forest

B. It is near industrial sites

C. It is in an isolated region

D. It is in an isolated forest

71. What is dependent on photosynthesis?

A. aerobic respiration

B. anerobic respiration

C. facultative respiration

D. animal respiration

72. A student collected air samples and measured CO_2 levels during daytime and nighttime. What conclusion would they arrive at?

A. Plants photosynthesize during daytime and respire during nighttime

B. Carbon flux in plants is dynamic

C. Plants that experience more nighttime respire more

D. CO_2 influx is higher than efflux at nighttime

73. What is the Keeling curve evidence for?

A. Alteration of carbon cycle by human land use change

B. Alteration of carbon cycle by human population growth

C. Alteration of carbon cycle by human economic growth

D. Alteration of carbon cycle by human fossil fuel combustion

74. Plants are green because they contain the protein chlorophyll. A bucket was left on the lawn for one week. When the bucket was removed, the grass under the bucket had turned from green to a yellowish white color. This change is due to the interaction between the grass and what other factor?

A. Decomposers

B. Sunlight

C. Moisture

D. Bucket

75. The diagram shows the energy flow involved in muscle contraction. Which arrow represents cell respiration?

$$\text{Sun} \xrightarrow[A]{} \text{Food} \xrightarrow[B]{} \text{ATP} \xrightarrow[C]{} \text{Muscle Activity}$$

A. B only

B. C only

C. B and C only

D. A, B, and C

76. In most ecosystems, the growth and survival of organisms are dependent on the availability of solar energy. What makes this energy available to all organisms in the ecosystem?

A. Heterotrophs feeding on autotrophs

B. Heterotrophs feeding on each other

C. Photoautotrophs

D. Decomposers

77. Why are energy pyramids narrowest at the top?

A. Tertiary consumers are inefficient feeders

B. Tertiary consumers have low population sizes

C. Tertiary consumers receive less energy per kill

D. Tertiary consumers do not receive all the energy of producers

78. Which observation might challenge the notion that the greenhouse effect alone explains current warming trends?

A. Rapid increases in atmospheric CO_2 levels

B. Increased volcanic eruptions in recent decades

C. A strong correlation between greenhouse gas emissions and rising temperatures

D. Periods of warming plateaus despite continuously rising CO_2

79. Which of the following cannot be concluded solely from observing rising atmospheric CO_2 concentrations?

A. That anthropogenic activities are the primary driver

B. That the greenhouse effect is intensifying

C. That specific regional climate patterns will shift

D. That fossil fuel combustion has increased over time

80. **[AHL]** Which of the following is not conclusive evidence that anthropogenic CO_2 emissions have altered the carbon cycle?

A. A sustained rise in atmospheric CO_2 as shown by the Keeling Curve

B. Strong correlations between industrialization and CO_2 levels

C. Carbon isotopes in CO_2 indicating a fossil fuel source

D. A decline in global gross and net primary production

81. In which question are food chains more useful than food webs?

A. How does energy move from an organism in one trophic level to the next?

B. How does energy move within a trophic level?

C. What preys on grasses?

D. How is organic matter recycled in a forest?

82. What is the total amount of living tissue in a trophic level?

A. Organic mass

B. Trophic mass

C. Energy mass

D. Biomass

83. What is carbon stored as in oceans?

A. Carbonate

B. Carbonic acid

C. Hydrocarbonic acid

D. Carbonate acid

84. Which term describes increases in biomass?

A. Biomass accumulation

B. Biomass magnification

C. Biomass massification

D. Biomass enlargement

85. Why are food webs formed from food chains?

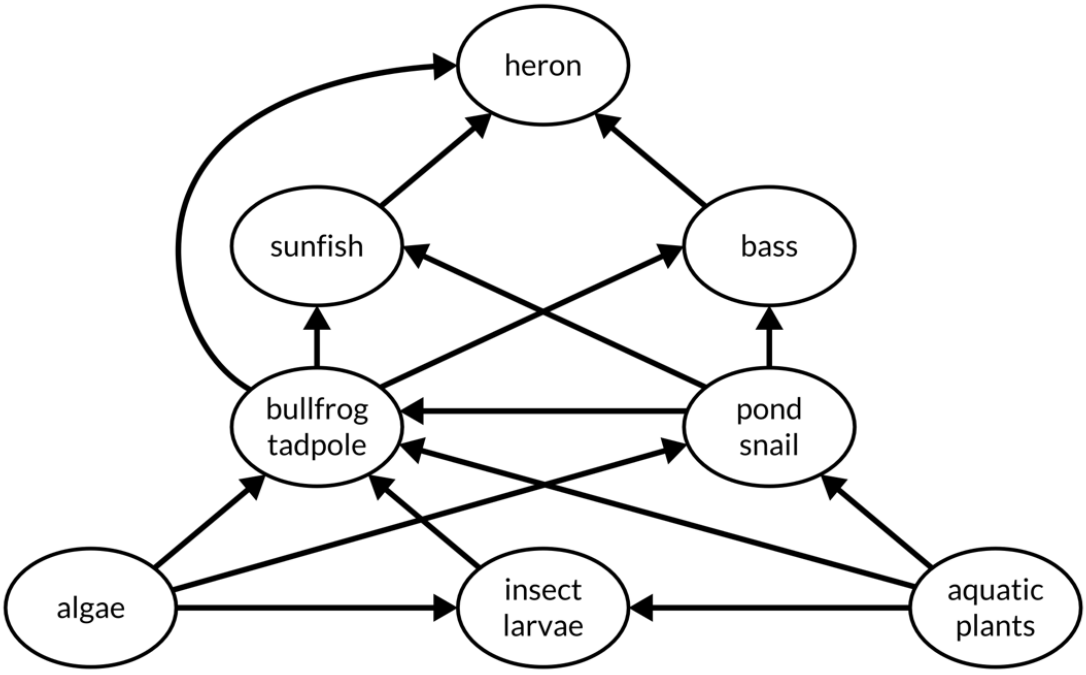
A. Many individuals feed on different organisms

B. Energy flows in several directions

C. Most ecosystems depend on producers

D. Herbivores eat many plants

86. Which of the following will likely occur if algae were removed from the food web in this diagram?



I. Sunfish population would increase

II. Bullfrog tadpole population would decrease

III. Insect larvae population would increase

A. I only

B. I and II only

C. II and III only

D. I and III only

87. In a section of forest, the gross primary productivity is 24 kg / m^2 / yr. If net primary productivity is 40% of gross production, what is the net primary production over two years?

A. 38400 g / m^2 / yr

B. 48000 g / m^2 / yr

C. 9600 g / m^2 / yr

D. 19200 g / m^2 / yr

88. How does adding a fertilizer to a garden improve primary productivity?

A. It mimics consumer activity

B. It mimics nutrient cycling

C. It mimics decomposer activity

D. It mimics autotroph activity

89. In an ecosystem, there are 5 g / m^2 of producers, 10 g / m^2 of herbivores, and 15 g / m^2 of carnivores. What type of ecological pyramid do these data represent?

A. Inverted pyramid of biomass

B. Inverted pyramid of energy

C. Pyramid of energy

D. Pyramid of biomass

90. The gross primary production of a grassland ecosystem in Kazakhstan is 244 g / m^2 / yr. The energy needed by producers for their own respiration is 98 g / m^2 / yr. What is the net primary production of this ecosystem?

A. 98 g / m^2 / yr

B. 146 g / m^2 / yr

C. 244 g / m^2 / yr

D. 342 g / m^2 / yr

91. The energy available at the producer level in an aquatic ecosystem in Silver Springs Florida is 7618 kcal / m^2 / yr. Approximately how much energy is available to secondary consumers?

A. 7.6 kcal / m^2 / yr

B. 762 kcal / m^2 / yr

C. 76.2 kcal / m^2 / yr

D. 1062 kcal / m^2 / yr

92. What is one way energy flows out of an ecosystem?

A. Solar energy is reflected off earth and back into the atmosphere

B. Decomposers break down energy in addition to organic matter, which reduces the total amount of energy in the ecosystem

C. Carbon dioxide dissolves into oceans away from terrestrial organisms

D. Cellular respiration produces heat as a byproduct, and this heat dissipates into the atmosphere

93. What is correct about recent carbon dioxide release into the atmosphere?

A. It is human-mediated

B. It is nature-mediated

C. It is human- and nature-mediated

D. It is mostly human-mediated

94. What is the role of electrons in energy flow within ecosystems?

A. They are involved in respiration

B. They are involved in photosynthesis

C. They are involved in photosynthesis and respiration

D. They store energy that is passed to consumers

95. A microscopic organism is found to live in a pool of digestive enzymes. Which group does it most likely belong to?

A. Saprotrophs

B. Detritivores

C. Heterotrophs

D. Mixotrophs

96. Which compound provides energy for heterotrophs?

A. Carbon dioxide

B. Oxygen

C. Protein

D. Iron

97. What role does oxidation play in ecosystem energy flow?

A. It transfers energy

B. It changes energy

C. It creates energy

D. It redistributes energy

98. How is energy stored in biomolecules released in organisms?

A. By ester reactions

B. By oxidation reactions

C. By condensation reactions

D. By hydrolysis reactions

99. Which of the following is/are not a way in which energy can be lost from food chains?

I. Reproduction

II. Growth

III. Survival

A. I only

B. I and II only

C. II and III only

D. I and III only

100. A change in an ecosystem causes a trophic level primarily composed of ectotherms to become mostly made up of endotherms. How would this affect primary production?

A. Increase gross primary production

B. Decrease net primary production

C. Increase gross primary production

D. Decrease net primary production

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