Diploma Programme
Programme du diplôme
Programa del Diploma

Biology
Standard level
Paper 1A

28 October 2025

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

1 hour 30 minutes [Paper 1A and Paper 1B]

Instructions to candidates

- Do not open this examination paper until instructed to do so.
- Answer all questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.
- A calculator is required for this paper.
- The maximum mark for paper 1A is **[30 marks]**.
- The maximum mark for paper 1A and paper 1B is **[55 marks]**.

19 pages

8825 – 6010
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1. Which characteristic of the ringed seal (*Pusa hispida*) is a consequence of the thermal conductivity of water?

A. Streamlined body

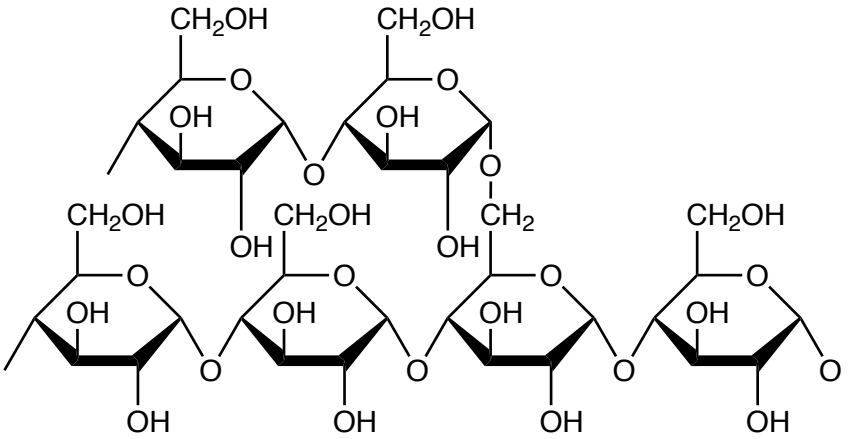
B. Sharp teeth

C. Blubber (layer of fat)

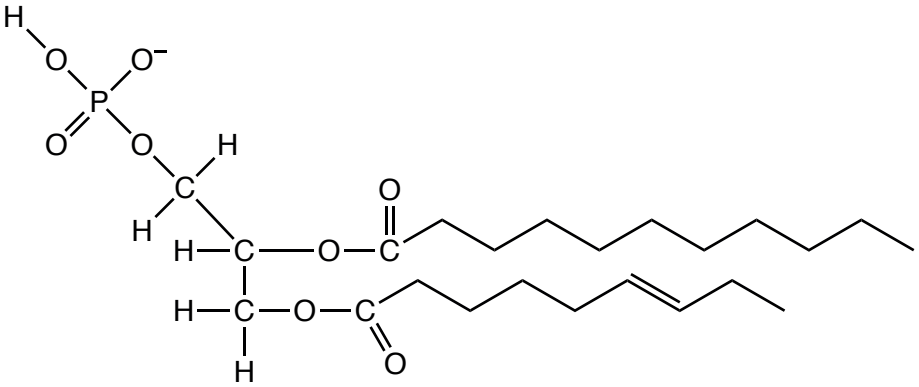
D. Lungs

2. Which molecular diagram shows a phospholipid molecule?

A.



B.



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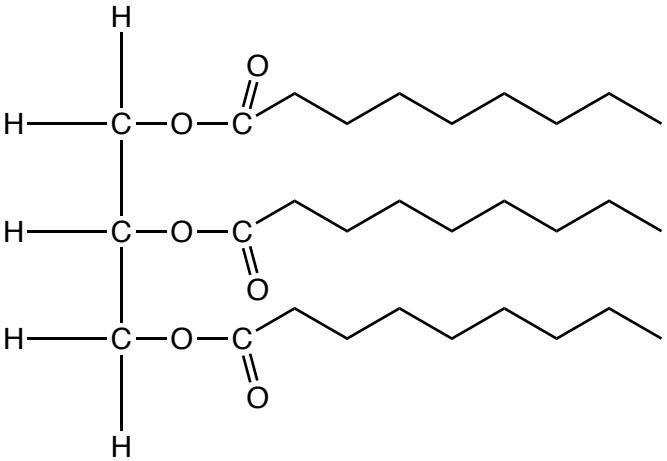

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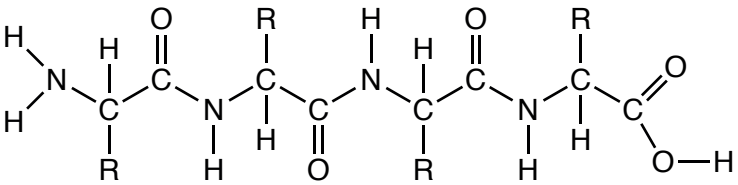


3. Which molecule is paired with the component of the cell membrane that allows it to pass through the membrane?

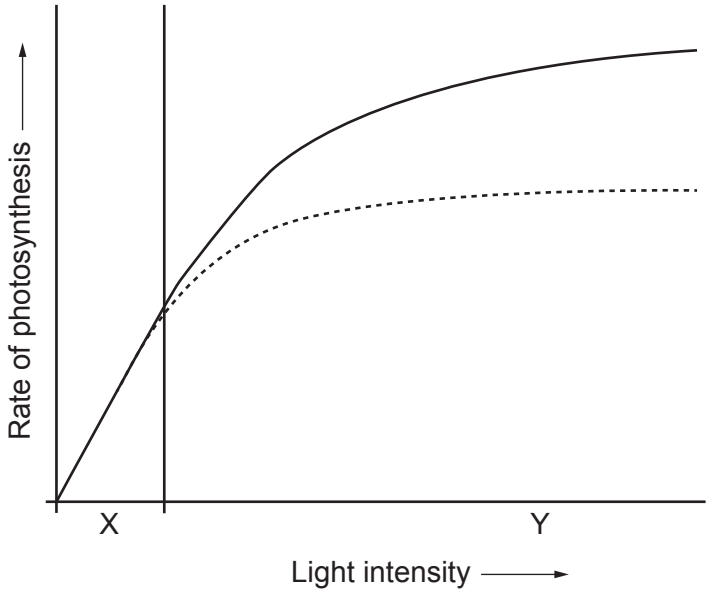
	Molecule	**Component of the cell membrane**
A.	insulin	aquaporin
B.	glycogen	channel protein
C.	oestradiol	phospholipid bilayer
D.	carbon dioxide	pump protein

4. Which are examples of anabolic and catabolic reactions?

	Anabolic reaction	**Catabolic reaction**
A.	hydrolysis of macromolecules into monomers	oxidation of substrates in respiration
B.	glycogen formation	hydrolysis of macromolecules into monomers
C.	oxidation of substrates in respiration	protein synthesis
D.	protein synthesis	glycogen formation

5. The graph shows the rate of photosynthesis as light intensity increases at two different carbon dioxide (CO_2) concentrations.

Key: —— 0.40 % CO_2 ----- 0.04 % CO_2



What are the limiting factors of photosynthesis at regions X and Y on the graph?

	X	Y
A.	CO_2 concentration	light intensity
B.	temperature	light intensity
C.	light intensity	CO_2 concentration
D.	light intensity	temperature

6. The table shows information on the genetic code of four different mRNA sequences. Which sequence demonstrates degeneracy in the genetic code?

	mRNA sequence	Amino acids
A.	UUU UUA UCU	Phe Leu Ser
B.	CUU CCU CUU	Leu Pro Leu
C.	AUG ACG AAG	Met Thr Lys
D.	GUU GGU GUG	Val Gly Val

7. A mutation in which type of cell could be inherited?

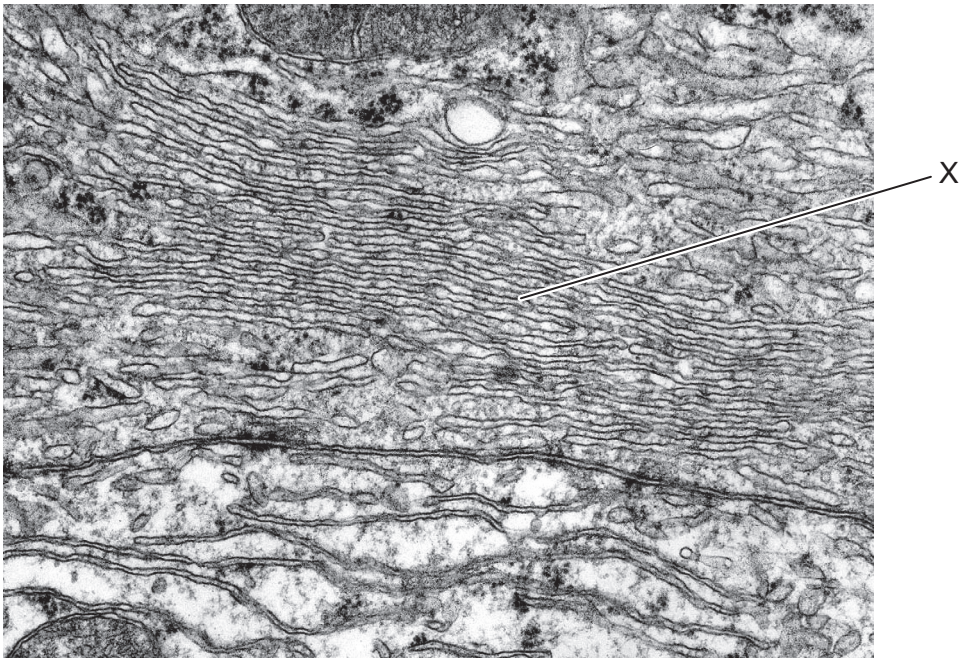
A. Beta cell in the pancreas

B. T-cell in the lymph

C. Sperm cell in the testis

D. Skeletal muscle cell in the diaphragm

8. The electron micrograph shows part of a eukaryotic cell.



What is the organelle labelled X?

A. Mitochondrion

B. Smooth endoplasmic reticulum

C. Lysosome

D. Nucleus

9. Which type of protein uses energy from ATP to transfer particles across membranes against a concentration gradient?

A. Glycoprotein

B. Pump protein

C. Aquaporin

D. Channel protein

10. Which specialized cell has the largest volume?

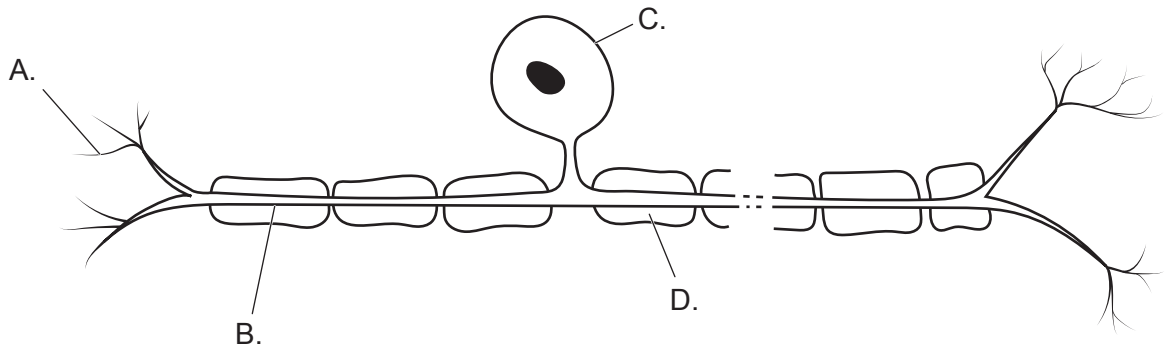
A. Egg cell

B. Sperm cell

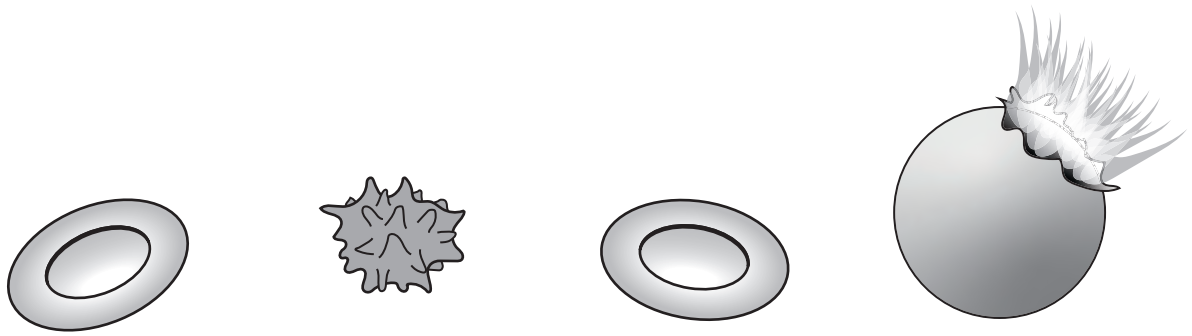
C. Red blood cell

D. White blood cell

11. The image shows a neuron. Which letter shows a dendrite?



12. Red blood cells were transferred from solution 1 to solution 2, 3 or 4. The images show the effects on these cells.



Solution 1 Solution 2 Solution 3 Solution 4

What can be concluded about the concentrations of the solutions?

A. Solution 1 is hypotonic to solution 4.

B. Solution 2 is hypotonic to solution 1.

C. Solution 3 is hypertonic to solution 4.

D. Solution 4 is hypertonic to solution 2.

13. The table shows the binomial naming of four species.

Organism	**Genus**	**Species**
W	*Felis*	*catus*
X	*Conus*	*catus*
Y	*Ameiurus*	*catus*
Z	*Felis*	*silvestris*

What can be concluded?

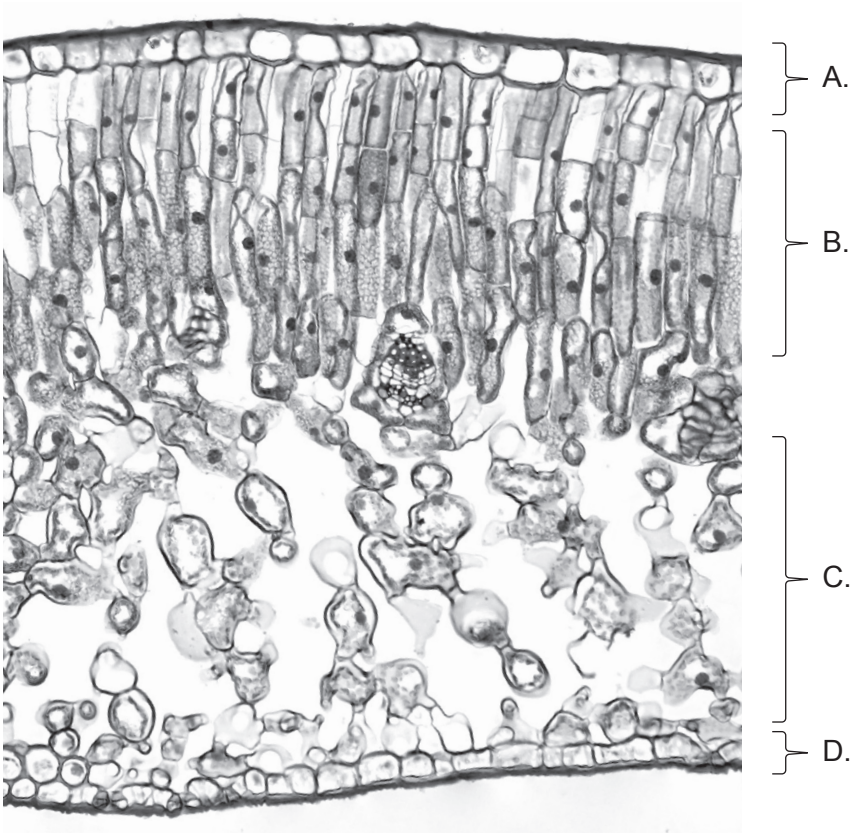
A. W, X and Y are the most closely related.

B. X and Y are the most closely related.

C. W and Z are the most closely related.

D. W is equally related to all the other species.

14. The image shows the transverse section of a leaf. Which letter identifies the palisade mesophyll?



15. What is a property of veins?

A. Flexible to allow compression

B. Elastic to maintain blood pressure

C. Fenestrations for rapid exchange

D. Narrow lumen to carry deoxygenated blood

16. Which is the receptor in a pain reflex arc?

A. Skeletal muscle

B. Grey matter of spinal cord

C. Pituitary gland

D. Sensory nerve ending

17. Which function is primarily associated with helper T-cells in the immune system?

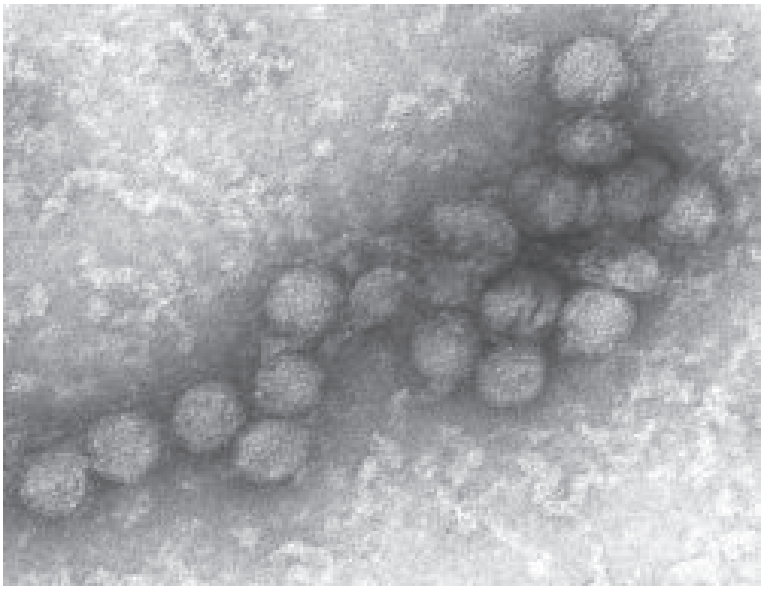
A. Phagocytosis of pathogens

B. Activation of other cells in the immune system

C. Antibody production

D. Retention as memory cells

18. The electron micrograph shows the Japanese encephalitis virus.



Why are some diseases, such as Japanese encephalitis, known as zoonoses?

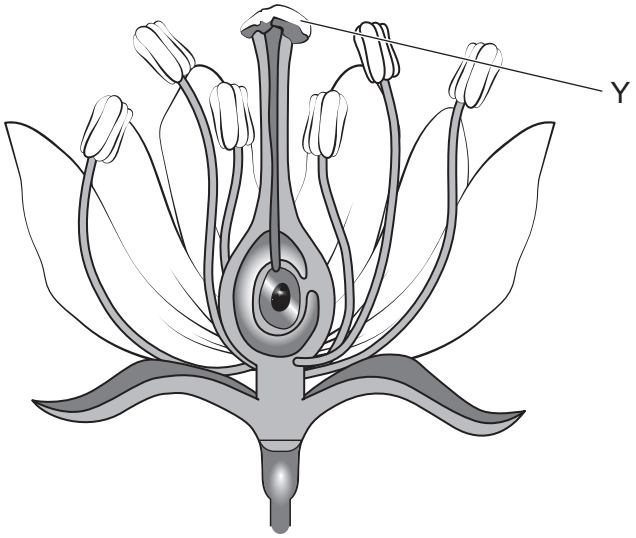
A. They can be directly transferred from an animal to humans.

B. They are transferred from human to human.

C. They are only found in animals in captivity (zoos).

D. They can directly transfer antigens into animal cells.

19. A cross-section of a flower is shown.



What is structure Y?

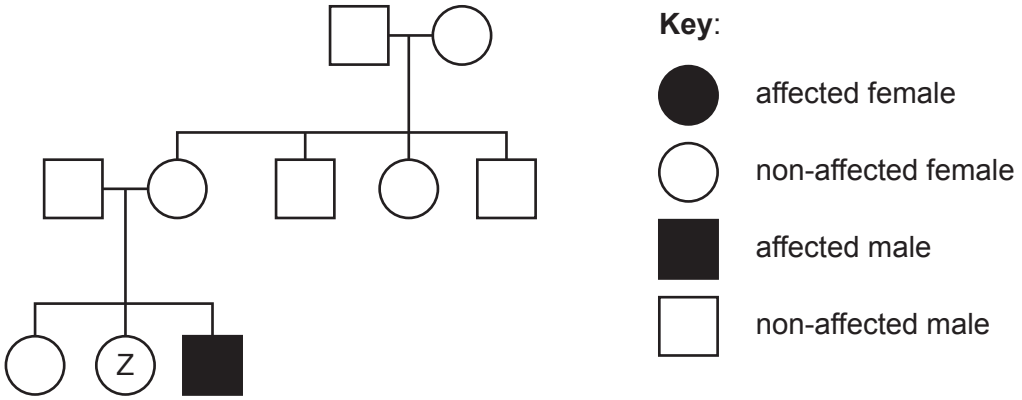
A. Anther

B. Nectary

C. Style

D. Stigma

20. The pedigree chart shows the incidence of colour blindness in three generations of a family. Colour blindness is caused by a sex-linked recessive allele.



What could the genotype of individual Z be?

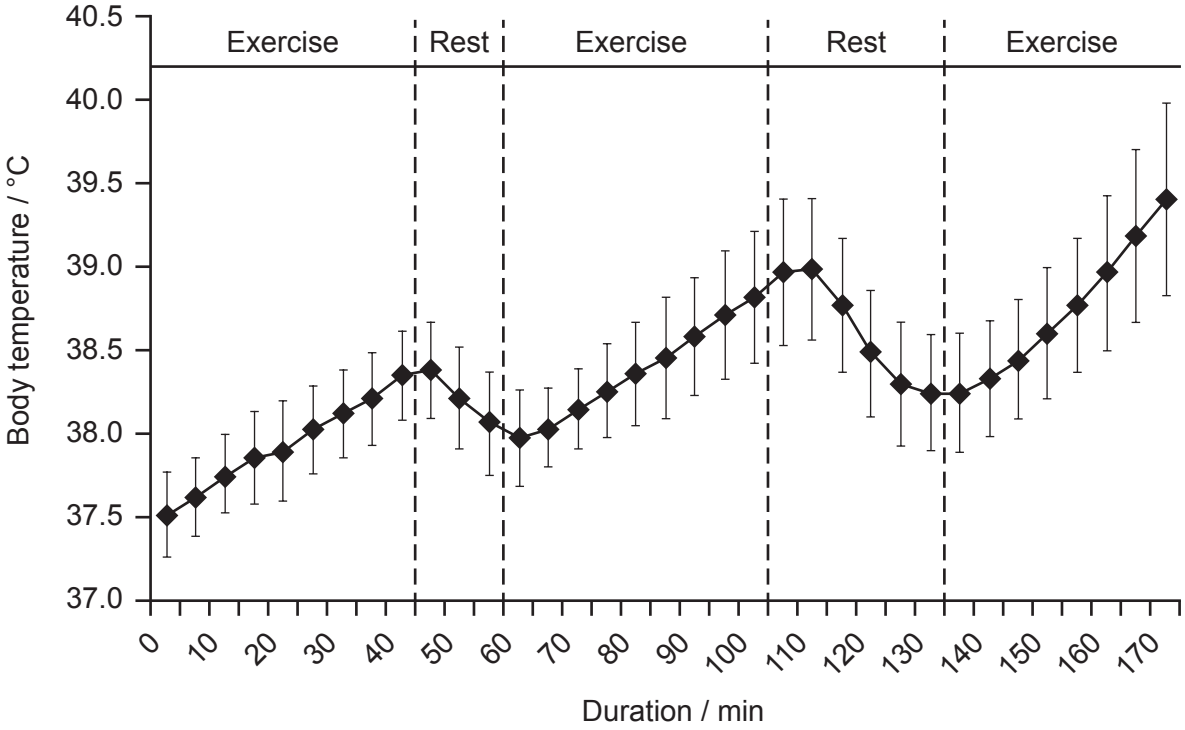
A. X^BX^B only

B. X^BX^b only

C. X^BX^B or X^BX^b

D. X^bX^b or X^BX^b

21. These results were obtained by measuring the body temperature of people exercising on a hot and humid day.



What mechanism could result in the changes seen during rest periods?

A. Shivering

B. Uncoupled respiration in brown adipose tissue

C. Vasodilation in the skin

D. Hair erection

22. Bonobos (*Pan paniscus*) and chimpanzees (*Pan troglodytes*) are primates.

Bonobo (*Pan paniscus*)

Chimpanzee (*Pan troglodytes*)

Separation by the Congo River allowed these two species to be formed. What was a consequence of the separation?

A. Natural selection

B. Reproductive isolation

C. Selective breeding

D. Analogous structures

23. What could minimize the loss of biodiversity?

A. Increase the rate of deforestation

B. Introduce species into new environments to control predation

C. Reduce the use of renewable energy

D. Rewilding of degraded ecosystems

24. What is evidence for evolution?

I. Homologous structures such as pentadactyl limbs

II. Domestication of dogs from wolves

III. Inheritance of acquired characteristics

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

25. What describes holozoic nutrition?

	Nutrition type	Digestion
A.	chemoautotrophic	none
B.	photoautotrophic	none
C.	saprotrophic	external
D.	heterotrophic	internal

26. Which interspecific relationship has a negative impact on both individuals?

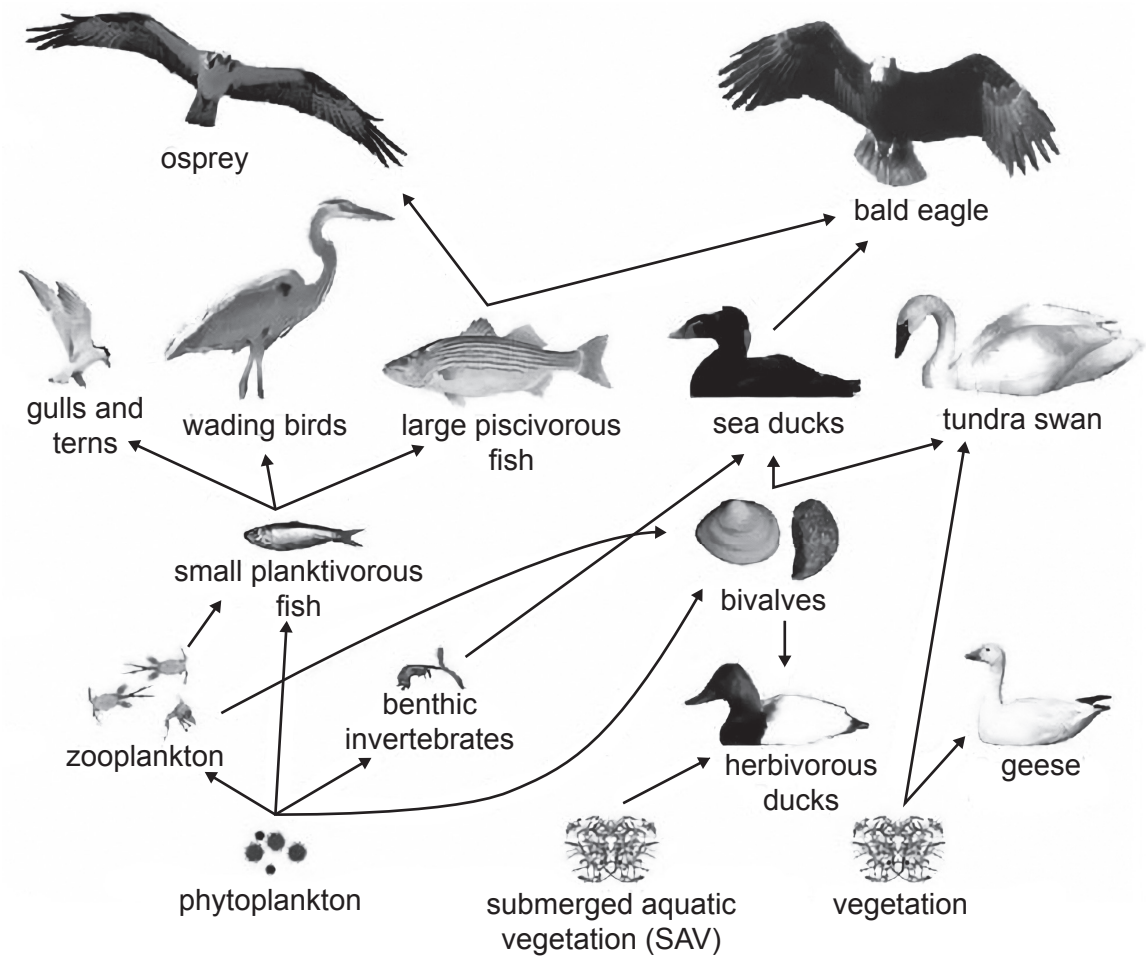
A. Competition

B. Mutualism

C. Parasitism

D. Pathogenicity

27. The image shows a food web from Chesapeake Bay, USA.



Which organisms are tertiary consumers in at least one food chain?

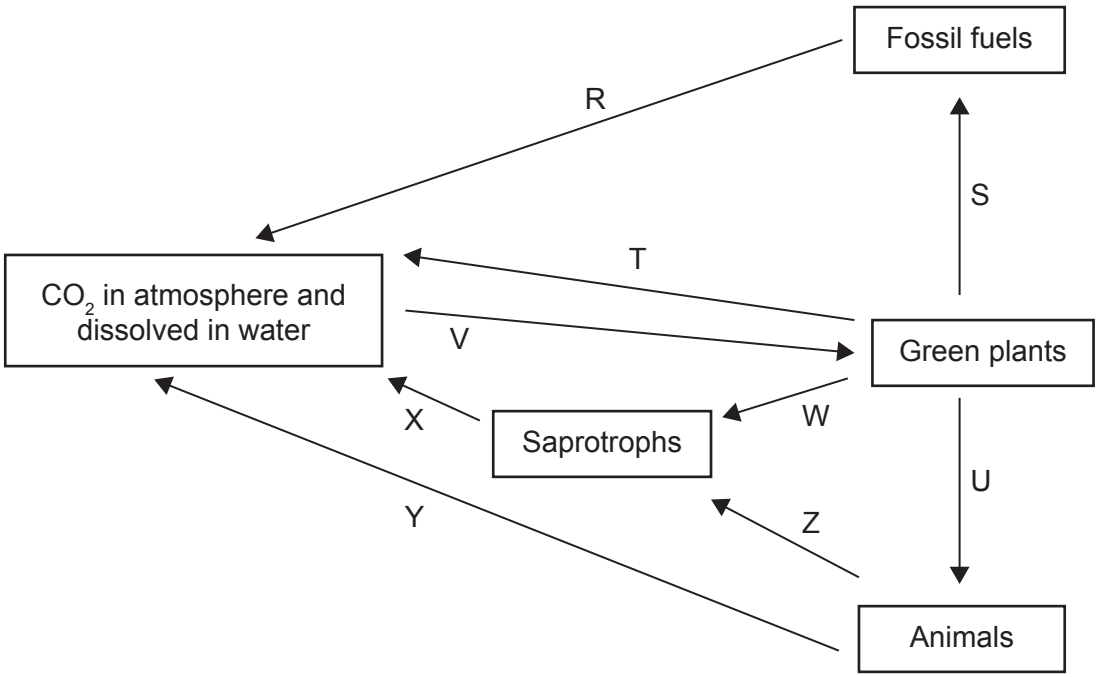
A. Small planktivorous fish and tundra swans

B. Herbivorous ducks and bald eagles

C. Wading birds and geese

D. Ospreys and benthic invertebrates

28. The diagram represents the carbon cycle.



Which arrows represent respiration?

A. R and V

B. T and Y

C. U and Z

D. W and X

29. A bird of paradise (*Ptiloris victoriae*) has very showy plumage and demonstrates a unique dance.

What type of selection pressure could have caused this plumage to evolve?

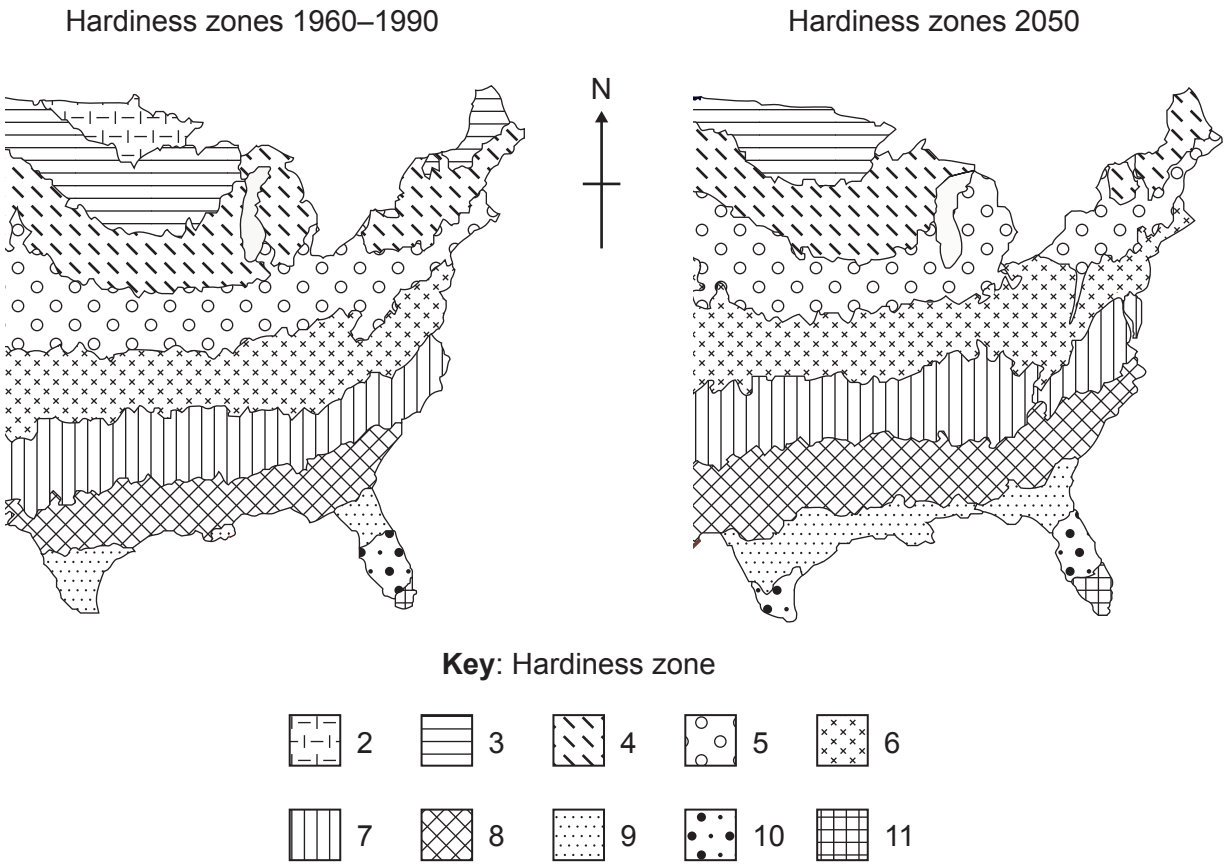
A. Interspecific competition

B. Abiotic factors

C. Paradigm shift

D. Sexual selection

30. The data shows how the hardiness zones in part of North America are predicted to change over the next 25 years. A hardiness zone is an area that has a certain average annual minimum temperature, a factor relevant to the survival of many plants. The lower the number, the more cold-resistant the plants must be.



What is a likely consequence of this change for tree species?

A. Tree species will spread northwards as climate changes.

B. Tree species that are not cold-resistant will decline.

C. There will be no change in the distribution of the tree species.

D. Tree species that currently live in the north will outcompete other tree species.

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