

APOLLO

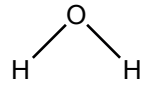
Water SL

Biology

First assessment 2025

6 questions | questions

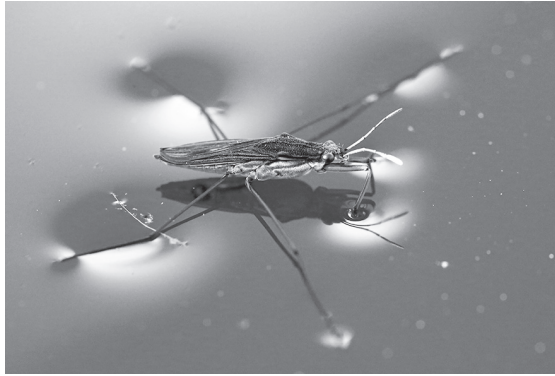
1. Which symbol indicates the polarity of the oxygen atom in the water molecule?



- A. $\delta +$
- B. $\delta -$
- C. $+$
- D. $-$

1. What describes bonding within a water molecule?
- A. Hydrogen bonding due to transfer of electrons
 - B. Double bonds due to equal sharing of electrons
 - C. Non-polar covalent bonding due to equal sharing of electrons
 - D. Polar covalent bonding due to unequal sharing of electrons

1. The photograph shows a pond skater.



Which property of water allows the insect to walk on water?

- A. Adhesion
- B. Capillarity
- C. Surface tension
- D. Transparency

1. Which of the following is a consequence of the adhesive properties of water?
- A. Stable temperatures of aquatic environments
 - B. Water movement by capillary action in soil
 - C. Transport of dissolved nutrients in blood plasma
 - D. Cooling effect of sweating

Section B

Answer **one** question. One additional mark is available for the construction of your answer. Answers must be written within the answer boxes provided.

7. Albert Szent-Gyorgi, the Nobel Prize winner for Physiology or Medicine in 1937, said, "There is no life without water."
- (a) Draw a labelled diagram to show how two water molecules interact with each other. [4]
- (b) Outline the effects of immersing animal and plant cells in pure water. [4]
- (c) Explain the process of transpiration and how xylem vessels are adapted for the transport of water from roots to leaves. [7]



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References:

- 1.a** Francis, L., McCluskey, D., Ganier, C. Jiang, T., Du-Harpur, X., Gabriel, J., Dhami, P., Kamra, Y., Visvanathan, S., Barker, J.N., Smith, C.H., Capon, F. and Mahil, S.K., 2024. *Nature Communications*, [e-journal] 15(913), [online] Available at: <https://doi.org/10.1038/s41467-024-44994-w>. Reference redacted. Source adapted.
- 1.d** Francis, L., McCluskey, D., Ganier, C. Jiang, T., Du-Harpur, X., Gabriel, J., Dhami, P., Kamra, Y., Visvanathan, S., Barker, J.N., Smith, C.H., Capon, F. and Mahil, S.K., 2024. *Nature Communications*, [e-journal] 15(913), [online] Available at: <https://doi.org/10.1038/s41467-024-44994-w>. Reference redacted. Source adapted.
- 4.** paveugra, 2015. *Respiratory system*. [image online] Available at: <https://www.gettyimages.co.uk/detail/illustration/respiratory-system-royalty-free-illustration/489734346> [Accessed 29 October 2024]. Source adapted.
- 5.** Bastian, C., 2022. *Three cows black and white group together in a field*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/three-cows-black-and-white-group-together-in-a-royalty-free-image/1440057213?phrase=cattle+in+field&adppopup=true> [Accessed 4 December 2024]. Source adapted.



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will not be marked.



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- 2.** What is a consequence of the ability of water to form many intermolecular hydrogen bonds?
- A. Ice has a higher density than water and floats, providing habitats for fish-eating mammals.
 - B. Light can pass through water, so algae can photosynthesise.
 - C. Some small invertebrates can walk on water surfaces.
 - D. Small amounts of energy are needed to change water from one state to another, so that evaporation rates and condensation rates are rapid.