ANSWER KEY.

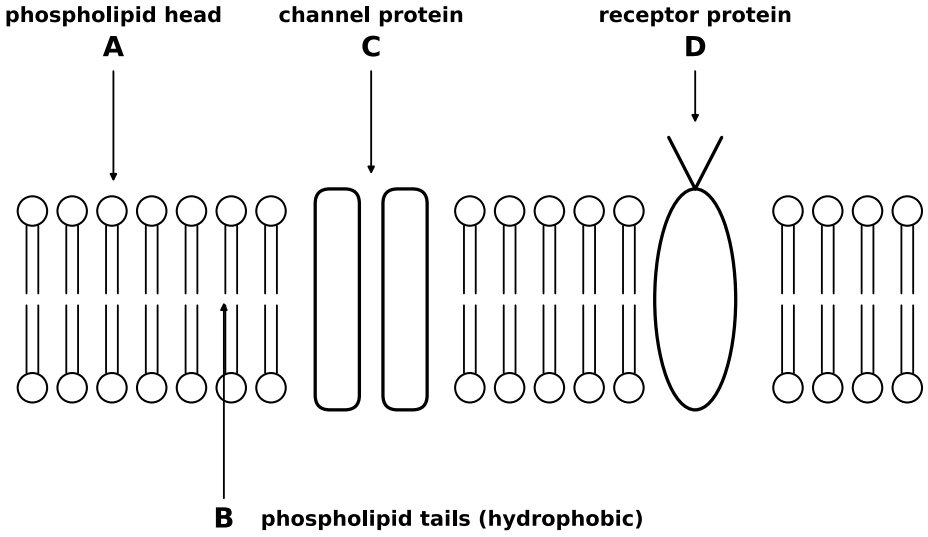
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The Cell Membrane

Biology | ANSWER KEY

Answer in complete sentences. Use the tables, graphs, and drawings as evidence.

1. The drawing shows part of a cell membrane. Name structures A, B, C, and D.



A _____ B _____

C _____ D _____

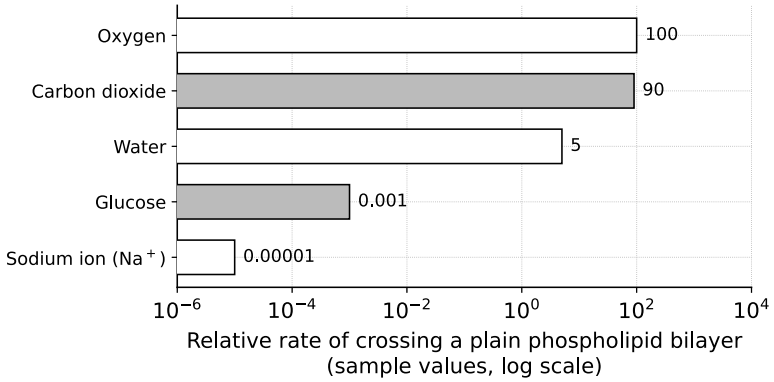
A: phospholipid head (hydrophilic); B: phospholipid tails (hydrophobic); C: channel protein; D: receptor protein.

2. Predict whether each substance can cross the bilayer without a protein. Explain each prediction.

Substance	Crosses the bilayer without a protein? (yes or no)	Explain
Carbon dioxide (small, nonpolar)	**Yes**	**Passes through the bilayer**
Glucose (large, polar)	**No**	**Needs a carrier protein**
Sodium ion (charged)	**No**	**Needs a channel protein**

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3. The graph shows how fast five substances cross a plain phospholipid bilayer (sample values).



Write a claim, evidence, and reasoning about which substances cross easily.

Claim: small nonpolar molecules cross the bilayer easily, and charged ions hardly cross it at all. **Evidence:** oxygen (100) and carbon dioxide (90) cross much faster than glucose (0.001) or sodium ions (0.00001). **Reasoning:** the inside of the bilayer is made of nonpolar, hydrophobic tails, which let nonpolar molecules through but block charged and large polar substances.

4. Explain why a phospholipid bilayer blocks ions. Use the words hydrophobic and nonpolar.

The middle of the bilayer is made of hydrophobic, nonpolar tails. Ions are charged, so they are not attracted to the tails and cannot easily pass through the middle layer.

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