Checking Oxygen Limits in a Warming Tank

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom aquarium model contains 2.0 L of water. The table gives the maximum concentration of dissolved oxygen at each temperature when the water is in contact with a large supply of air. Assume the water volume stays fixed.

Temperature (°C)	**Maximum dissolved oxygen concentration (mg/L)**
10	10
25	8

1 How much oxygen can the 2.0 L of water hold at the 25 °C limit?

(1) 4 mg

(2) 8 mg

(3) 16 mg

(4) 20 mg

2 The water starts at its 10 °C limit. If it warms to 25 °C and reaches the new limit, calculate how much oxygen leaves the water. [1]

Answer and work

A separate model starts with the same 2.0 L of water at 25 °C but contains only 12 mg of dissolved oxygen. It is in a completely filled, sealed container with no air space. No chemical reaction produces or consumes oxygen.

3 When the sealed model cools to 10 °C, will it automatically reach the 10 °C limit? Explain using the amount of oxygen in the container. [1]

Answer and work

4 A student says a higher solubility means the water must contain more dissolved oxygen. Use the sealed model to evaluate that claim. [1]

Answer and work