Checking the Water Level After Floating Ice Melts

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

A display floats a 10.0 g piece of pure ice in water. The ice has a total volume of 10.9 mL. In the model, floating ice displaces its own mass of water. Liquid water has a density of 1.00 g/mL. The ice melts completely without water leaving the container.

Quantity	**Reading**
Ice mass	10.0 g
Full ice volume	10.9 mL
Volume of displaced water while it floats	10.0 mL

1 Which reading describes how much space the floating ice takes up below the water surface?

(1) 10.9 mL total ice volume

(2) 10.0 mL displaced water volume

(3) 10.0 g ice mass

(4) The difference between the full volume and mass

2 Calculate the volume of the liquid made when the ice melts. Compare it with the previous submerged volume. [1]

Answer and work

3 A student predicts a lower water level because the full volume of the ice exceeds the melt volume. Explain why the displaced volume gives the appropriate comparison. [1]

Answer and work

The particle display represents ice as a more open arrangement of water molecules held by attractions between molecules. The molecules themselves stay intact during melting.

4 Use the particle model to explain why the full ice volume can exceed the melt volume even though the mass stays fixed. [1]

Answer and work