PEEBEDU

Water Properties Explorer

Name: _____ **Period:** _____ **Date:** _____

> Open **peebedu.com** and navigate to **Water Properties Explorer**. Click the **Start Exploring** button to begin. Read the introduction popup, which describes four key properties of water: Polarity, Cohesion, Heat Capacity, and Density.

Free Response Questions

Question 1 — Conceptual Analysis

> **Simulation Task:** *Set the temperature slider to 0°C and note both the air temperature and water temperature values. Then slowly move the slider to 40°C and observe the difference between the two temperatures as air temperature increases.*

(A) (1 pt) **Describe** the type of molecular interaction between water molecules that allows water to absorb large amounts of heat with minimal temperature change.

(B) (1 pt) **Explain** why the lake's water temperature changes less than the air temperature as air temperature increases from 0°C to 40°C.

(C) (1 pt) **Predict** how the water temperature readout would respond as air temperature rises from 0°C to 40°C if water had a significantly lower specific heat capacity.

(D) (1 pt) **Justify** your prediction.

Question 2 — Analyze Model / Visual Representation

> **Simulation Task:** *Move the temperature slider to −15°C and observe where the ice layer forms relative to the liquid water, and note the fish swimming beneath it. Read the status shown on the Ice Density card. Then move the slider to 20°C and observe what happens to the ice.*

(A) (1 pt) **Describe** the difference in density between ice and liquid water reported on the simulator's Ice Density card.

(B) (1 pt) **Explain** why the layer of ice that forms at the surface allows the fish to survive in the liquid water beneath it.

(C) (1 pt) **Represent** the simulated lake at −15°C by drawing a labeled diagram that shows the ice layer, the liquid water beneath it, and the fish.

Draw your diagram here.

(D) (1 pt) **Explain** why the hydrogen bonds that form as water freezes make ice less dense than the liquid water below it.

1.1.A.1