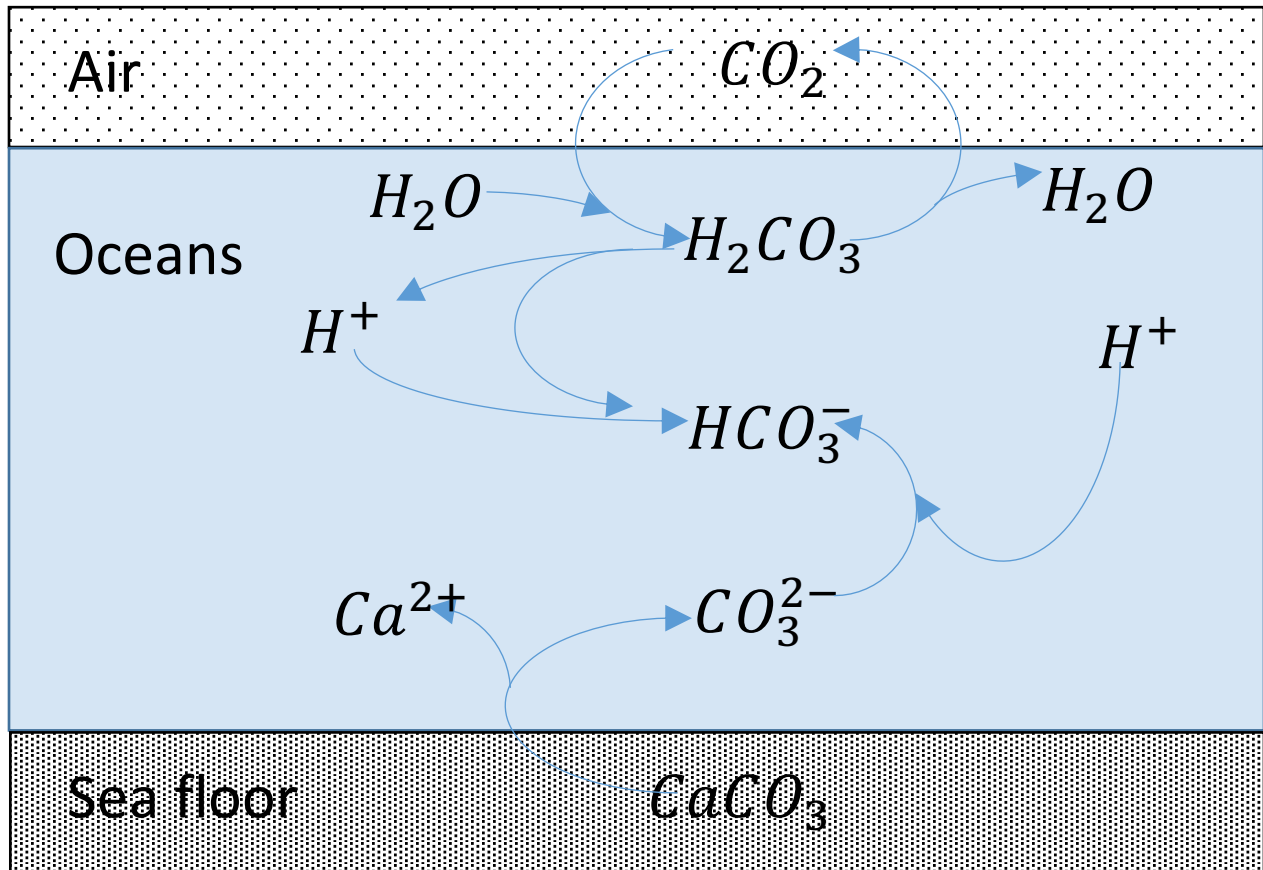


NAME: _____

FLOW DIAGRAM FOR OCEAN CARBONATE CHEMISTRY

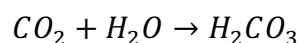


Step 1 – pH of water

Measure out about 100 mL of sea water into an Erlenmeyer flask. Add a few drops of pH indicator. What's the pH? Is sea water acidic or basic?

Step 2 – Effect of dissolved CO₂

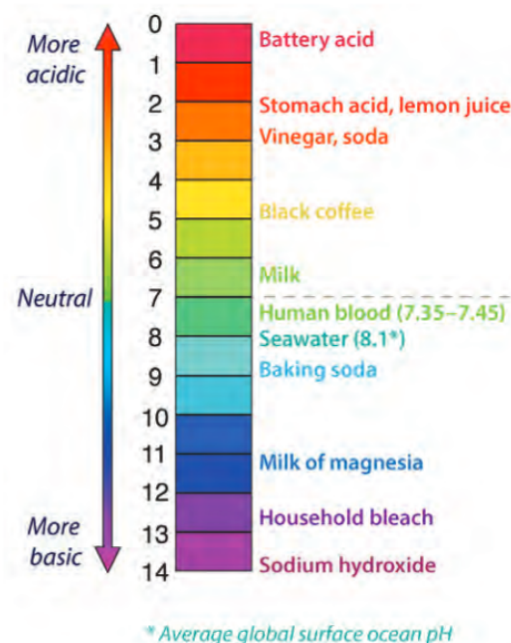
Bubble some CO₂ through the water in your flask. What's the pH now? The reaction you just carried out can be expressed as



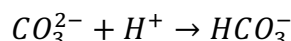
followed by



which **releases** H^+ , and therefore should make the solution **more acidic** (did it?). Circle these reactions and label them as "Step 2" on your flow diagram.

**Step 3 – Effect of carbonate ion (CO₃²⁻) on pH**

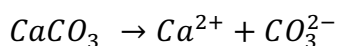
Add a little sodium carbonate to your flask. What's the pH now? The reaction you just carried out can be expressed as



which **consumes** H^+ , and therefore makes the solution **less acidic** (did it?). Circle this reaction and label it as "Step 3" on your flow diagram.

Step 4 – Properties of calcium carbonate (CaCO₃)

Empty out your flask, and add tap water and a few drops of pH indicator. Now add a little calcium carbonate to your flask. What's the pH now? How does it compare to the pH of ocean water? Does it look like the carbonate is fully dissolving? The reaction you just carried out is



Circle this reaction and label it as "Step 4" on your flow diagram.

Step 5 – A super-acidified ocean

Add some concentrated hydrochloric acid to your flask. What's the pH now? Does it look like the calcium carbonate is dissolving?