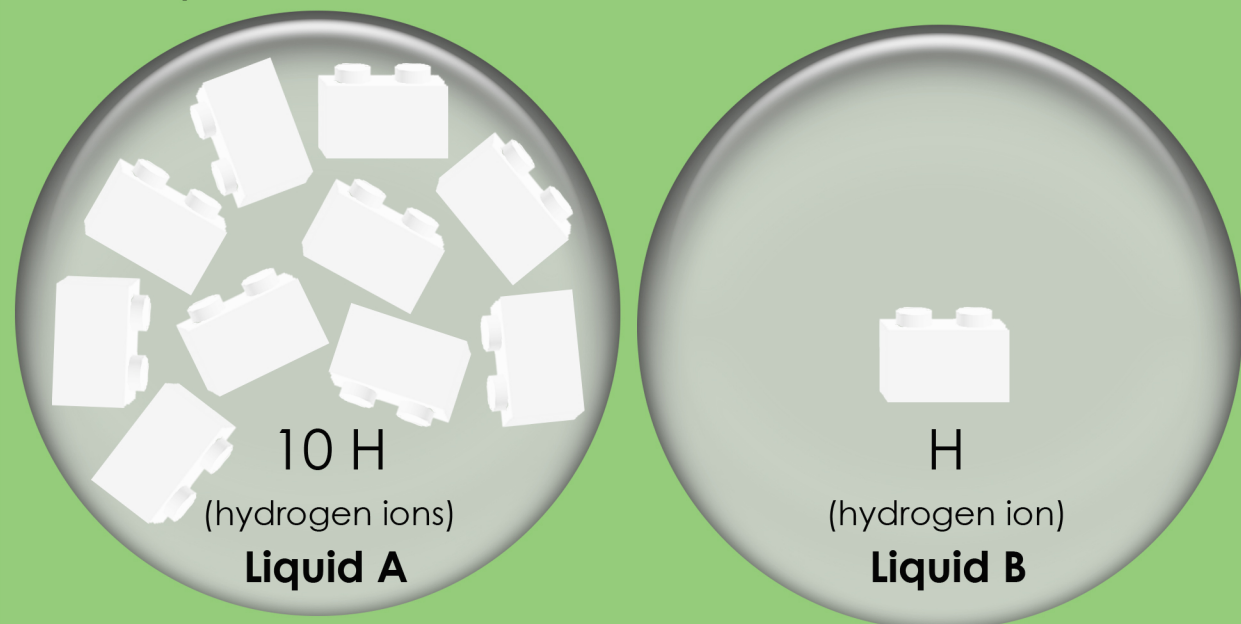


Oceans and the pH Scale

Follow the numbers (1-4). Questions and actions to do are in **bold**. Answers upside down below.

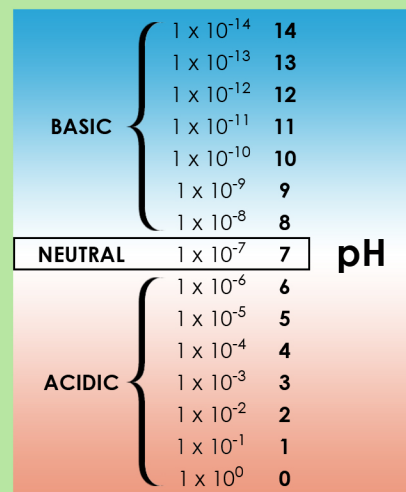
1 WHAT IS pH?

Build a model of two liquids. Place the hydrogen bricks on their pictures. The H in pH means hydrogen. We use pH numbers to describe acids and bases. Acids have many free hydrogens. Bases have few free hydrogens. **Which liquid is more acidic?**



Optional Advanced Chemistry Fact!

Liquid A and Liquid B are one pH unit apart. The pH scale is logarithmic. A change of one pH unit is a x 10 change in free hydrogens!

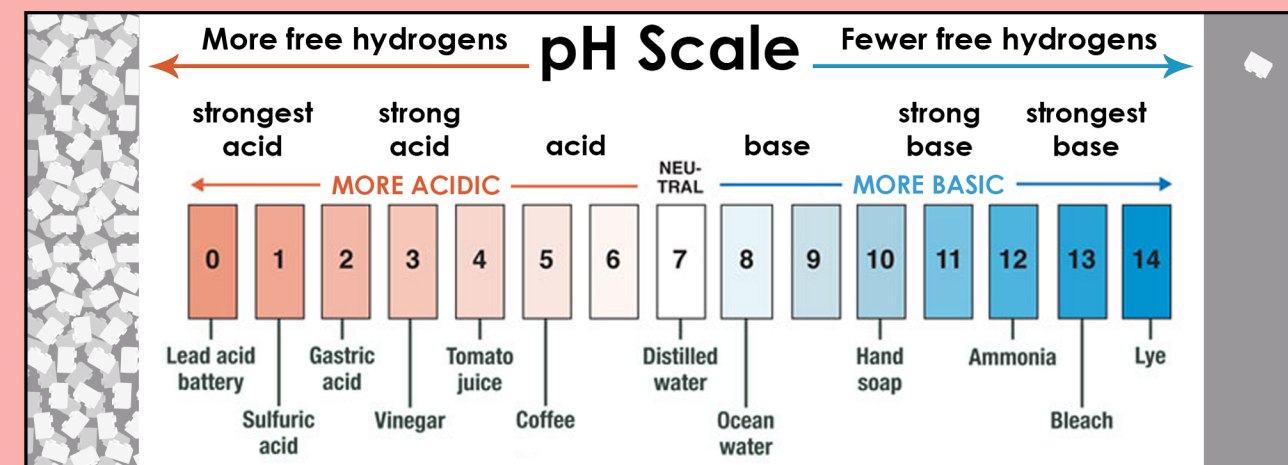


2 HOW DOES THE pH SCALE WORK?

The numbers on the pH scale may surprise you. Liquids with low pH numbers have lots of free hydrogens.

Look at the pH scale below:

- Point to the number of the strongest acid.
- Is coffee an acid or a base?
- Point to the number of the strongest base.
- Is ocean water an acid or a base?



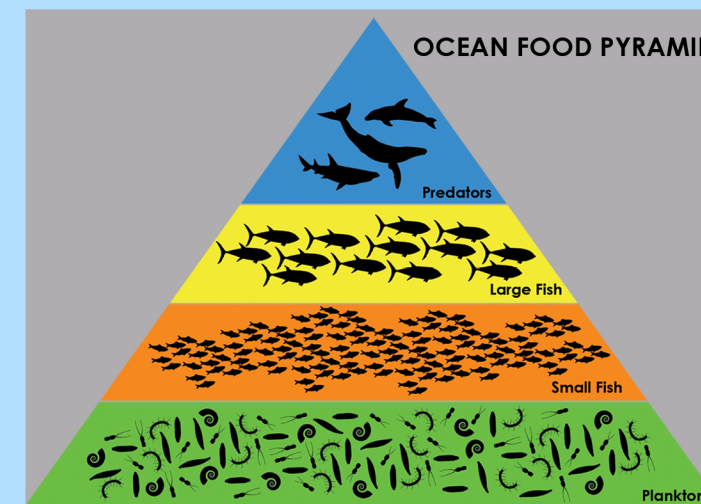
3 HOW IS OCEAN pH CHANGING?

Place the hydrogen bricks on their pictures. Reuse the hydrogen bricks above. Compare the pH numbers for the past, present, and future ocean. Is the ocean becoming more acidic?

<p>Past Measured pH 8.2</p> <p>Past Ocean (1910) had a known amount of free hydrogens</p>	<p>Present Measured pH 8.1</p> <p>Present Ocean (2017) has 25% more free hydrogens</p>	<p>Future Predicted pH 7.8</p> <p>Future Ocean (2100) will have 150% more free hydrogens</p>
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4 WHY DO WE CARE ABOUT OCEAN pH?

A small change in ocean pH can affect many sea creatures. For example, if the tiny plankton with shells in the ocean fail to grow, many creatures that eat plankton, like fishes and whales, may die out.



What can we do? We can reduce the amount of CO₂ released into the air by not burning fossil fuels. We can produce energy from solar and wind power instead. We can conserve electricity, recycle, and bike or walk instead of driving. These actions will help keep the oceans healthy and help people who depend on fish for food. Let's work together for the planet! **Name the actions below that can help.**

