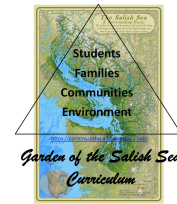


Garden of the Salish Sea Curriculum
Pre-Day 2: Ocean Acidification Laboratories
Wade King Elementary
Third Grade



NAME: _____

Video Questions- The Other CO₂ Problem

Watch the video at: <https://www.youtube.com/watch?v=kvUsSMa0nQU> and answer the questions below.

1. What is the octopus's big problem?

2. What does the shellfish use calcium carbonate for?

3. Who has caused the problem of ocean acidification?

4. When the oceans become more acidic, what major food source will die?

5. What part of the food chain do clams eat?

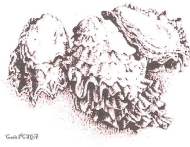
6. Who must change to reduce ocean acidification?

7. _____ causes the oceans to become more acidic, which is destroying the animals that live in the ocean's homes.

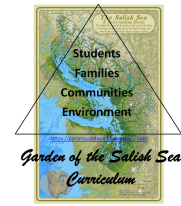
8. What is the increase in acidity in the oceans? _____%

9. The burning of fossil fuels (oil and gas) is causing the oceans to be more acidic. What are ways you can help reduce the need for fossil fuels? _____





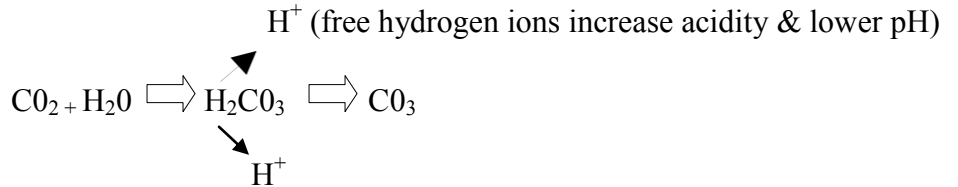
Garden of the Salish Sea Curriculum
Day 2: Ocean Acidification Laboratories
Wade King Elementary
Third Grade



NAME: _____

The Human Smoke Stack

When carbon dioxide (CO₂) interacts with water (H₂O), a chemical reaction occurs:



When you exhale, **carbon dioxide (CO₂)** is released in your breath. Carbon dioxide from our breath is the same thing that comes from a car when it burns gas or from a coal burning power plant. Many sources of **CO₂** come from natural processes, but too much **CO₂** produced by humans is a problem for shell-building sea life. When there is too much carbon dioxide in our air, it becomes polluted. The oceans can absorb the excess carbon dioxide in the air, which causes a shift in water chemistry. We can measure these changes carbon dioxide causes in the water by measuring the pH.

Following the procedures, complete the experiment and then answer these questions:

Data Type **Cup #1 (changing variable, breath)** **Cup #2 (no change, controlled variable)**

Color		
pH		

What changes did you see in the changing variable cup (the one you breathed into)?

What color was the solution before you breathed into it? _____

What color did the solution change to after you breathed into it? _____

Change: Why did the color of the solution change? _____

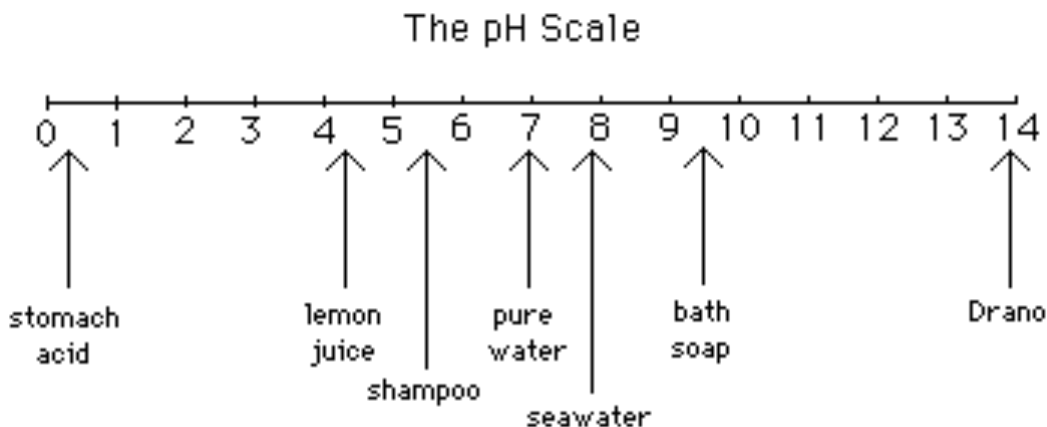


The pH of Household Solutions

The pH scale is used to describe the acidity of a solution. The pH scale goes from 0 to 14 and changes from **acidic** to **basic** as the number increases. Pure water is **neutral**, with a pH of 7, right in the middle. Notice that seawater is slightly basic.

With your lab group:

1. First, predict where on the pH scale each solution will fall. Use relative pHs to determine if each solution will have a pH higher or lower than pure water first, then compare if pH will be higher or lower than the household solutions on the pH scale below. This is called a hypothesis.
2. Use a piece of litmus paper to test the pH of each household solution. Repeat 3 times (each time is called a “trial”).
3. In the table below, measure and record the pH of each solution using the closest color on the chart to determine the pH of each solution. (Remember, pH below 7 is acidic, 7 is neutral, and above 7 is basic.)



Household Solution	Prediction	pH Trial 1	pH Trial 2	pH Trial 3
Vinegar				
Lemon Juice				
Club Soda				
Pure Water				
Baking Soda dissolved in distilled water				
Tums dissolved in distilled water				



Investigation: I'm Melting

Observe the shells that were soaked in vinegar (acid) to shells soaked in distilled water (neutral). Compare the shells soaked in vinegar to the shells soaked in water. Draw a picture of the two jars and describe what happened to the shells soaked in acid using complete sentences.

Shells soaked in acidic solution:

Shells soaked in neutral solution:

Observed differences between shells soaked in acidic solution vs. shells soaked in a neutral solution:



Day 2: Ocean Acidification Laboratories

A Tale of Two Cities:



Perspective: Look at the two cities (also show above). Which one looks like the city and ocean that is healthier, and why?

Look at the **watershed map**. How far away do you live from a stream, a lake, or the ocean?



Day 2 Review:

Thinking about today's activities

What are three things you learned?

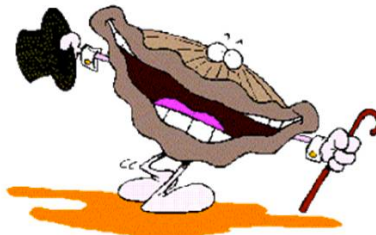
1. _____
2. _____
3. _____

What are two things that you already knew?

1. _____
2. _____

What is one thing that surprised you?

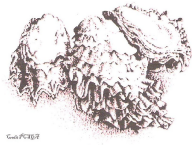
1. _____



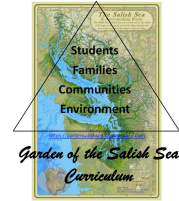


Explore the Garden of the Salish Sea website: <https://gardensalishsea.squarespace.com/>. Using evidence from an article or video, write a paragraph describing what you think is interesting about shellfish and why they are important to humans, other animals and the environment. What are some of the threats facing shellfish? Use another piece of paper if you need more space.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



Garden of the Salish Sea Curriculum
Post Day 2: Ocean Acidification Laboratories
Wade King Elementary
Third Grade



NAME: _____

Coastal Communities Forum Blog

For this activity, visit: <https://gardensalishsea.squarespace.com/costal-communities-forum/>

During computer time in class or in the library, go to the internet and share what you've learned about shellfish and the ocean with students from other schools in other places. Type a message reflecting on your Salish Sea Challenge, topics covered during this unit, or a current event about the ocean. It could even be your favorite seafood recipe! Use the space below if you'd like to make a draft before making an entry on the online blog.

