



Ocean Acidification in a Cup, Part 2:

Building on what we learned in the first experiment about how our ocean and atmosphere interact, this time we see how a more acidic ocean directly impacts our iconic shell-building species.

As we burn fossil fuels, we increase the amount of carbon dioxide in the atmosphere. That carbon dioxide is taken up by our oceans, and a chemical reaction occurs. As the carbon dioxide diffuses into the ocean, carbonic acid forms. More and more carbonic acid means a lower pH in our ocean, and trouble for animals building shells. Creatures like crabs and scallops cannot survive without a properly formed shell (built principally from calcium) and are harmed by ocean acidification. To demonstrate this, we are conducting a simple experiment with chicken eggs. Eggs are constructed in a similar way to a crab's exoskeleton or scallop's shell. The thinner chicken eggs make for a faster experiment- plus you may already have eggs in your kitchen!

Materials:

- Two containers, large enough to submerge an egg
- Vinegar
- Tap water
- Two raw eggs

Instructions:

1. Label each container with some tape and a sharpie "tap water" and "vinegar"
2. Fill each container enough to submerge each egg
3. Drop an egg in vinegar and an egg in water
4. Let the eggs soak undisturbed for 24 hours
5. Make note of the changes you notice after 24 hours. They are pretty drastic!

What to look for:

Egg shells are built using calcium. An acidic environment damages structures made of calcium. Once the 24 hours have passed, take a close look at your vinegar egg versus your tap water egg. Do they look

different? Has one changed? Try and *gently* remove each egg from the containers and place them side-by-side on a cutting board or plate. Do they feel different? A bonus experiment is to go beachcombing, bring home some shells, and try soaking them in vinegar- the shells you find along the beach will be thicker, so the effects may take longer. However, the acidic vinegar will create similar results on the thicker shells.

Before:



After:

