



TRY THIS OUT!



SHELL ACIDIFICATION

Time: 1 day
Difficulty: medium

Climate change is acidifying our oceans – and fast. In this experiment, you'll be able to see one of the problems it causes to mollusks.

WHAT YOU NEED

- Egg shell
- 2 glass jars (no lids needed)
- Tap water
- Vinegar
- Marker
- Paper towels

MAKE IT

1. Crack the egg and rinse the shell. Egg shells are made of the same compound as marine mollusk shells (like clam shells).
2. Place one half of the shell in each of the glass jars.
3. Label each of the jars, one with “vinegar” and one with “water”.
4. Fill the jars with enough liquid so that the shells are submerged.
5. Leave them to sit overnight.

TEST IT

Remove the shells from the jars. Place them on a paper towel and then scratch them with your fingernail. Does one seem softer than the other? Now, bend each one and try to break them. Does one break easier than the other?

EXPLAIN IT

Vinegar (acetic acid) is acidic, whereas water is neutral on the pH scale. What this means is that vinegar releases a higher concentration of free hydrogen ions (H^+) than water. Mollusk shells, like your egg shells, are made of a compound called calcium carbonate ($CaCO_3$). This chemical is basic, or the opposite of acidic. This means that once this basic compound comes in contact with the acidic vinegar, they undergo a chemical reaction which releases a gas. The vinegar erodes the shell, making it weaker and easier to break.

OBSERVE IT

Climate change is slowly acidifying the ocean, due to the ocean taking in higher levels of carbon dioxide (CO_2) from the atmosphere. Although the ocean will never increase to the acidity of vinegar, it is definitely slowly acidifying now. This could have drastic impacts over time on soft-shelled mollusks. They use their shells for protection, and if the shells are weakened, they won't be useful any more.

GO FURTHER

Put your shells back in the same jars they came from. Leave them there for another day, another week, or even another month. Record your observations every day. What happens to them?

