



Build a Shell

Help a sea snail rebuild its shell!

Activity Guide

This sea snail needs your help to strengthen its shell! Explore how too much CO₂ in the ocean affects calcifying animals like the sea snail.

Try This!

Step 1: Set up the sea snail board.

Step 2: Shake the bag filled with game pieces. The circle pieces represent the hydrogen atoms that damage the sea snail's shell. The other pieces represent the calcium that helps to build strong shells.

Step 3: Empty the pouch contents next to the sea snail board and spread them out a little.

Step 4: Use the carbonate magnet on the string to pick up the calcium pieces. Try not to pick up any hydrogen pieces!

Step 4: Look at the rules to complete building the snail's shell.

Game Rules!

- If you pick up a calcium piece with the carbonate magnet, place it on the sea snail shell to help it build its shell.
- If you pick up a circular hydrogen piece with the carbonate magnet, as a penalty you must take off one calcium piece from your snail's shell, and place all of the pieces back in the pouch. Shake the pieces well and empty them again next to the game board to keep playing.
- You must build the entire shell with calcium pieces to win.

Climate Connection

Ocean acidification occurs when too much CO₂ is dissolved in seawater, triggering a chemical reaction that creates carbonic acid. Carbonic acid is very destructive for animals with shells such as snails, corals, crabs and clams.

For a challenge try playing with less H⁺ pieces to see if it is easier to grab more Ca⁺² pieces!

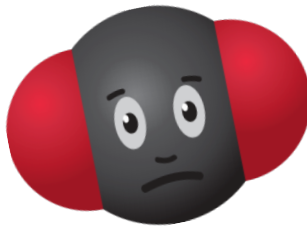


Turn the page over to learn more!

What's Happening?

Ocean acidification occurs when too much CO_2 is dissolved in seawater, triggering a chemical reaction that creates carbonic acid. Carbonic acid releases hydrogen ions (H^+) into seawater, which prevents carbonate (CO_3^{-2}) from joining with calcium (Ca^{+2}) to form calcium carbonate (CaCO_3). This process affects animals that need calcium carbonate to create their shells, such as snails, corals, crabs and clams, by causing their shells to dissolve and lose their strength.

The game you have just played demonstrates how this chemical reaction occurs. As the ocean absorbs carbon dioxide from the atmosphere, the seawater becomes more acidic and therefore has an excess of H^+ ions. It is very difficult to join CO_3^{-2} with Ca^{+2} without accidentally grabbing onto H^+ ; this is something very similar to what is happening in our oceans.



In addition to ocean acidification, too much carbon dioxide (CO_2) in our atmosphere increases ocean temperatures and raises sea levels.

Climate Detective Challenge

When does ocean acidification occur?

Find the answer to this question on the Activity Map!

