

incredible!

American Egg Board

Grades 6–9

# Shrinking and Growing Eggs

Two identical eggs—two different results! That's what you get when you try this simple experiment that looks into chemical reactions and permeability.

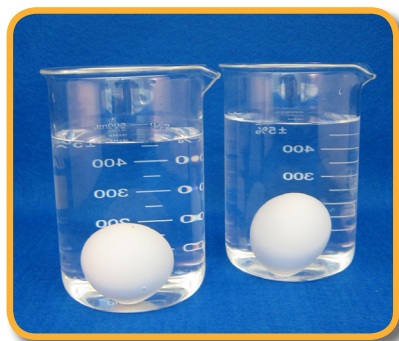
## What You Need

- vinegar
- several beakers or tall glasses
- several raw eggs
- corn syrup
- water
- tongs (optional)



## What You Do

1. Place each of two eggs in a separate beaker of vinegar. Let them soak in the vinegar for 24 hours. (Each egg's shell will dissolve, leaving a "naked" egg.)

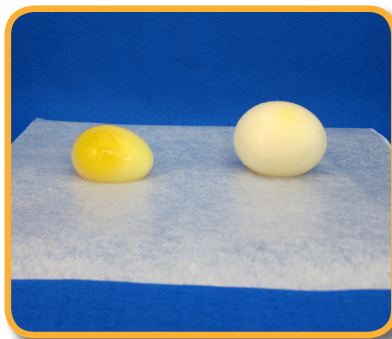


Step 1

2. The next day fill a clean beaker with corn syrup and another beaker with water.
3. Place one naked egg in each beaker. Set the beakers in an area where they won't be disturbed for 24 hours.
4. The next day remove the eggs from the beakers and observe what happened. Why do you think the appearance of the two eggs is different?



Step 3



Step 4

What happens if you put the corn syrup egg in water? Try it and observe what happens after a few hours.

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## Why It Happened

When the eggs are covered with vinegar, bubbles will appear on the outside of each eggshell. Eggshells are primarily made of calcium carbonate. The calcium carbonate reacts with the acetic acid in vinegar and causes the release of carbon dioxide gas that can be seen as bubbles on the eggshells. This chemical reaction causes the eggshells to dissolve. The eggs are larger after being soaked in the vinegar for several days because of a process called *osmosis*. Osmosis causes some of the vinegar to move through, or *permeate*, each egg's membrane, which causes the egg to enlarge.

Why did the egg in the corn syrup appear to shrink? Corn syrup has a high concentration of dissolved molecules of sugar, which gives it a high density. These molecules are too large to pass through the semipermeable egg membrane. The smaller water molecules, on the other hand, can pass through the membrane. The water in the egg will move from the area of higher density through the membrane to the corn syrup until the density is the same on both sides. So water will move from the egg to the syrup, and the egg shrinks. The egg that was soaked in water appears swollen because of osmosis too. This egg has less water concentration than that of the water. So, to equalize the concentration, the water molecules moved into the egg instead of moving out of it. The result is an expanded egg!

Always wash your hands  
with soap and water after handling raw eggs.  
In addition, corn syrup is super sticky stuff,  
so you might want to keep some wipes or  
wet paper towels handy.

Keep the focus on eggs  
by having students complete a  
research skills worksheet, "Finding  
Eggcellent Resources."

