



Curiosity Guide #510

Diffusion and Osmosis

Accompanies Curious Crew, Season 5, Episode 10 (#510)

Massive Eggs

Investigation #7

Description

Have a little egggy fun with this interesting exploration!

Materials

- At least 2 raw eggs, but have extra just in case
- 3 clear containers
- Vinegar
- Sink with running water
- Digital scale
- Distilled water
- Clear corn syrup
- Paper
- Pencil

Procedure

- 1) Submerge 2 eggs in vinegar and leave for 3 days.
- 2) Carefully remove the de-shelled eggs.
- 3) Rinse the eggs off with running water.
- 4) Weigh each egg on a digital scale and record its mass.
- 5) Submerge one egg in distilled water, which is a hypotonic environment.
- 6) Wait several hours.
- 7) Carefully pull the eggs out of the liquids. Weigh each egg again to see how its mass changed.

8) What happened?

9) What did you see on top of the corn syrup?

10) Try switching the eggs and run the experiment again. What happens?

11) What other liquids might you try to test? What results would you expect?

My Results

Explanation

The acetic acid in the vinegar causes the egg's outer shell to dissolve. The outer shell is made of calcium carbonate. When combined with acetic acid, the calcium carbonate has a chemical reaction that dissolves the shell.

In the distilled water, which is a hypotonic environment, water enters the egg because there is more water outside than inside the egg. Water is able to move through the semi-permeable membrane into the egg. The water tries to reach an equilibrium of water concentration both inside and outside the egg.

In the hypertonic corn syrup, there is a higher concentration of water in the egg, so the water passes out of the egg and reduces its total mass. The water that exits the egg is visible on top of the corn syrup because the water is less dense and floats to the top.

If you run the experiment again, the larger egg will shrink in the corn syrup and the smaller egg will enlarge in the water.

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