



# Science Experiment: Amazing Eggs

## Project: Foods,

### Supplies:

- Eggs, old and new
- Water
- Salt
- Pins
- Ice
- Saucepans
- Range tops to boil water

**Time: 10 minutes pre prep, 25 minutes to cook, 20 minutes to prepare deviled eggs**

### What to Do:

1. Divide old eggs purchased at least 10 days previous and new eggs. Do one of each in each of the following situations.
2. Prepare several comparisons:
  - a. Start cooking eggs in one pan with already boiling water (cook in boiling water for 25 minutes then leave in water) and one where they start in cold water (bring cold water to boil, turn off heat and cover for 25 minutes. After 25 minutes plunge in an ice water bath)
  - b. Prick a small hole in the large end of one egg and don't prick the end of another egg.
  - c. Add salt to the water of one pan and none to another pan.
3. Cook eggs in b. and c. with the 'cold water' method as explained in a.
4. Once cooked, peel the eggs and pay attention to how easy or hard it was to do.
5. Pay attention to the shape and color of the eggs.
6. Cut each egg in half long ways to observe color of the yolk and texture of the whites.

### Reflect:

1. Why did we use old eggs and new eggs?
2. What difference did you notice in the peelability between the old eggs and the new eggs, if any?
3. What do you notice about the shape of the 'pricked' egg and the non-pricked eggs?
4. Was there any difference in the eggs cooked in salt water vs. fresh water?
5. Is there a difference in the color and texture of the eggs cooked with the 'hot method' vs. the 'cold method'?

**Apply:** Why is there a difference between the eggs' shape, texture, peelability, and color? Is there a difference in the taste of the eggs?

The temperature of the water affects how the proteins of the eggs cook. Egg proteins are wound up like little balls, but when heat is applied they start to unravel and form weak bonds with other groups of proteins. This results in coagulation and the solidifying of the egg white and yolk. What difference did you notice in the texture of eggs cooked with the cold water method versus those that stayed in the hot water for a longer amount of time? Why was there a difference in the texture? How about the color of the yolk? The longer the egg cooks the Sulphur in the yolk and the iron in the white has time to react and causes some discoloration and perhaps a stronger Sulphur smell.

Was there a difference in the shape of the eggs that had one end pin pricked and those that didn't? Eggs have a small air pocket on the large end of the egg; the white is encased in a thin membrane. When you prick that end the air can escape and the inside of the egg can expand and fill that space (the membrane keeps the egg white inside and keeps it from escaping).

Was there a difference in the peelability of old eggs compared to the new eggs? The higher the acid content in the eggs, the harder they are to peel because of the bond the acid makes with the side of the eggs. Carbon dioxide is a weak acid that escapes as the egg ages, thus weakening the bond and making them easier to peel.

Was there a difference in the taste of the eggs? Probably not. None of these methods necessarily affects the taste of the eggs (even cooking in salt water). However, the experience could be affected because of the texture and color of the eggs.

**Source: <http://www.exploratorium.edu/cooking/eggs/explore-text.html>**