

## The Naked Egg Experiment

### How can you get an eggshell off without breaking the egg?

#### PROCEDURE:

1. Take time to examine your raw egg. Write down your observations on the next page (question #1).
2. Being careful not to crack the egg, carefully place it in the jar or glass.
3. Pour enough vinegar over the egg until it is completely covered (if 500 mL of vinegar is not enough, add more until covered).  
**Optional:** You can even try adding some food colouring to each jar to make a coloured egg!
4. Watch the egg for about five minutes. Observe the bubbles of gas that are formed on the surface of the egg; you will notice that many more will appear with time. Let it sit overnight.

#### MATERIALS NEEDED:

- Raw Egg – 1 per student
- White Vinegar
- Glass or clear jar (clean jelly, olive, or pickle jars work) – 1 per student
- Food Colouring (optional)

The bubbles that you see on the surface of the shell are the result of the acid in the vinegar reacting with the calcium carbonate in the shell. This reaction produces a gas called carbon dioxide!

5. The next day, remove the egg from the jar or glass and rinse it under a trickle of water in the sink while gently rubbing the shell with your fingers. If the shell does not come off completely, return the egg to the jar or glass, and try again the next day. It may take two or three days to remove the shell completely.  
Once the shell starts to rub off under water, you will notice that the hard outer shell will disappear and reveal the egg white and yolk surrounded by a thin membrane. Now your egg is naked!
6. Examine your egg carefully. Hold it up to a bright window or light. You will see the yolk as a dark blob inside. Turn the egg upside down. Can you see the yolk “sinking” to the bottom of the egg?
7. Now, flip over the page to complete some more exploration questions and activities! Starting at Question #2!

## QUESTIONS AND EXPLORATION ACTIVITIES

1. Take the time to observe your 'raw egg':

a. What does the egg feel like?

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b. What colour is it?

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c. What shape is it?

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d. Additional observations:

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2. Take the time to observe your 'naked egg':

a. What does the egg feel like now? Describe how things have changed (colour, shape, texture etc.)

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b. Additional observations:

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## TRY SOME OF THESE TESTS BELOW!

### CAN YOU SEE THROUGH AN EGG?

Well, in general, you cannot see through a regular raw egg but what about a rubber egg? What happens when you hold the naked egg up to a flashlight?

**TEST IT!** You can see through it! You can even see the yolk rolling around inside. Why is this? Because the hard outer shell is no longer there, you can see through the membrane of the egg.

### CAN AN EGG BOUNCE?

Yes!! How high can an egg bounce? If you did a coloured egg, did it bounce differently than a regular white egg?

**TEST IT!** How high can your egg bounce before it breaks? Watch out! This might get messy!

### WILL A RUBBER EGG BURST?

Of course, we were prompted to wonder what would happen if you burst the naked egg. We tried it...With a quick prick from a skewer, the egg burst! The images below show what the naked egg looked like afterward. (Be sure to have a container to catch the mess!)



### WHAT HAPPENED – AND WHY?

Now we know that when an egg is placed in vinegar, bubbles will form on the shell of the egg. These bubbles are a chemical reaction between the acid in the vinegar and the base in the calcium carbonate of the eggshell. When an acid and a base mix they form carbon dioxide which is a gas.

You most likely also observed that the egg grew slightly larger as it sat in the vinegar. When you took the egg out of the vinegar, it felt soft because all the carbon escaped out of the shell in those little bubbles. The egg still stayed together and did not fall apart because it had an invisible membrane on the surface of it which did not react with the vinegar.

Now you know how to remove an eggshell without breaking it!