

# Interactive Notes-“Physical and Chemical Change”

## Student Materials (per group of 4 students):

Demo 1	1-250mL beaker 2/3 full of tap water 1-zipper-seal baggie with 3 spoons of salt; labeled “Salt” with marker 1-plastic spoon 1-raw egg
Demo 2	1-pair of goggles 1-test tube with <a href="#">zinc</a> pellet in the bottom (item # WW94390M06 at <a href="#">sciencekit.com</a> ); stoppered and standing in a test tube rack
Demo 3	1-zipper-seal baggie with 3 spoons of baking soda ( $\text{NaHCO}_3$ ); labeled “Baking Soda” 1-400 or 600 mL beaker with ~50mL vinegar 1-tealight candle sitting in the bottom of an empty 250 mL beaker
Demo 4	1-beaker or vial with about 5ml <a href="#">Luminol</a> solution (item #WW9459800 at <a href="#">sciencekit.com</a> )
...and	4-note sheets

## Additional Teacher Materials:

PowerPoint

[Hydrochloric acid](#) and pipet/dropper (see demo #2)

1-lighter- the automatic clicker kind is handiest

[Chlorine bleach](#) (or another oxidizer that works with your Luminol solution); and pipet/dropper

## Beforehand:

- Close blinds before class. There will be two times today when darkness is needed (demos 2 & 4).
- If you have enough materials you should prepare all 30 sets of what you will need all day for demos 2-4 ahead of time. That means putting zinc pellets into test tubes, pre-pouring Luminol into vials, and scooping your first batch of salt and baking soda into baggies. It might take you (or a student helper) about an hour or two to do all this, but imagine trying to get that done during class the next day with everything else going on!
- Try these demos out for yourself well ahead of time so you’re familiar with them. They each have their own personalities.
- Insert page and paragraph numbers from relevant pages in your textbook at the bottom of slides 1 and 2 if you choose to have the class read from it together. This is a good way to connect with your textbook as well as transition into the next demo. You can also delete these page inserts, or Copy and Paste them onto later slides if needed.
- Print extra copies of the notes pages on paper for yourself, students that are slow writers or can’t see well, and for absentees. Click “File” → “Print” → then where it says “Print what:“ select “Handouts” → and then “OK”.

Interactive Notes: Physical & Chemical Change



Do: Stirred salt into water with an egg at the bottom.

See: The egg floats because salt made the water more **dense** than the egg.

What's Happening: A **physical change** is a change in size, shape, color or state of matter. The salt, water, and egg are still there in the end.

1.

Read p. 1 together  
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Have student #1 (of the 4) put the egg in the water and see what it does (sink). After removing it, have them pour in the salt from the baggie and stir, stir, stir for about 30 seconds. When the egg is put back in, it floats.

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The change in the water can be related to your classroom. This morning at 5 am your room was empty. Now there are 30 students and their things in it. More “stuff” in the same space, making it more full. By adding salt to the water, we filled the spaces in the water with more stuff. That little bit of salt made it full enough that now it’s more dense than the egg.

The salt and baking soda are in zipper-seal bags today for the sake of ease- 1. baggies take up much less room than do beakers, 2. when sealed they won’t spill, and 3. when refilling them it’s tons easier and quicker to just say “put 3 spoons of salt in the baggie” than to have them measure 25 grams of it.

As a side note, it is possible to squeeze a raw egg in your hand without breaking it... so long as the egg is snug in the ball of your hand with the fingers wrapped all around, applying equal pressure to all sides at once.

*(end of Teacher Notes preview)*

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**Interactive Notes: Physical & Chemical Change**



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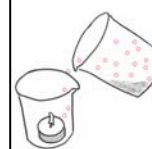
**Do:** Combined hydrochloric acid & zinc in a test tube. Stopped, then lit.

**See:** A flammable gas built up pushed the stopper out.

**What's Happening:** A **chemical change** occurs when a new substance is made by rearranging the atoms.



Read p. 1 together



**Do:** Mixed vinegar with baking soda and poured a gas onto a candle.

**See:** The flame was extinguished!

**What's Happening:** CO<sub>2</sub> formed from atoms present in the reactants. The **Law Of Conservation Of Mass** states that reactants and products weigh the same because atoms just rearrange, and nothing is lost or destroyed.

Total Atoms	
Reactants	Products
Na: 1	Na: 1
H: 5	H: 5
C: 3	C: 3
O: 5	O: 5



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### Your homework

What is the difference between a physical and chemical change? Answer with 3 sentences:

1. The definitions
2. One example of physical
3. One example of chemical



**Do:** Combined Luminol & bleach.

**See:** The Luminol glowed for a few seconds.

**What's Happening:** A **catalyst** is a substance that speeds up a chemical reaction. In this case bleach caused the Luminol to emit light.

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**Clean Up:** this is what your box needs to look like in 5 minutes.



- Person 1**
  - 3 spoonfuls of salt in baggie
  - Empty/rinse beaker
  - Fill it 2/3 full of water.
- Person 2**
  - Put test tube in "used" test tube rack
  - Put new tube with zinc in rack
  - Put goggles in "used" box, get new pair
- Person 3**
  - Empty and rinse big beaker
  - Put 25 ml. fresh vinegar in it
  - And 3 spoonfuls of baking soda in baggie
- Person 4**
  - Put Luminol vial in "used" area
  - Put new vial in box
  - Count 4 new note sheets

### ◆ Student Handout

Topic: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Do: \_\_\_\_\_

See: \_\_\_\_\_

What's happening: \_\_\_\_\_

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Do: \_\_\_\_\_

See: \_\_\_\_\_

What's happening: \_\_\_\_\_

### ◆ Drawings & Pictures

