**VIRTUAL LAB: Physical and Chemical Changes**

**Beginning Question:** How do physical changes differ from chemical changes?

**Background Information:**

Matter can undergo physical and chemical changes. In a physical change, matter changes its appearance (physical properties) but not its composition. Examples of physical changes include changes of state (between solid, liquid, and gas phases) and making mixtures. On the other hand, in a chemical change, matter does change its composition (new substances are made). For example, the Statue of Liberty, which is covered with copper, turned green upon exposure to air because the copper reacts with gases in air to form new compounds.

The following are clues that indicate that a chemical change **may** have occurred:

• unexpected color change or odor change

• formation of gas (bubbles form)

• formation of a precipitate (solid forms in a liquid)

• energy change (change in temperature, light, sound)

**Task:**

For each “station”, click on the link. In your journal, you should describe the initial appearances and observations of the reaction during and after. ORGANIZE your answers using the format below.

STATION #:

INITIAL APPEARANCE:

OBSERVATIONS:

TYPE OF CHANGE:

CLUE:

**Station #1: Lead Nitrate and Potassium Iodide solutions**. [Shower of yellow](https://www.youtube.com/watch?v=DITY2rXYU-I)

**Station #2: Potassium Chlorate and Gummy bear.** [Gummy](http://www.youtube.com/watch?feature=player_embedded&v=txkRCIPSsjM)

**Station #3: Elephant toothpaste.** [Elephant toothpaste](http://www.youtube.com/watch?v=3Tn-7JcZJuQ)

**Station #4: Copper and Nitric Acid.** [Cu + Nitric acid](http://www.youtube.com/watch?v=uOa2v0Y0leU)

**Station #5: Carbon Disulfide and Nitrogen Oxide.** [Copper Disulfide and Nitrogen Oxide](http://www.youtube.com/watch?v=rP07Rqv8qgg)

**Station #6: Chemiluminescence.** [Chemiluminescence](http://www.youtube.com/watch?v=XXoDvUkV3Uk)

**Station #7: Color changing milk.** [Milk](http://www.youtube.com/watch?v=TN72mGkMerc)

**Station #8: Silver nitrate and Hydrochloric acid.** [Silver Nitrate and HCl](http://www.youtube.com/watch?v=34LCTrJl9nE)

**Station #9: Ammonium Thiocyanate and Barium Hydroxide Octahydrate.** [Watch this!](http://www.youtube.com/watch?v=MyAzjSdc3Fc&feature=related)

**Station #10: Salt Crystal Garden.** [Salt crystals](http://www.youtube.com/watch?v=uoexANHeWoU&feature=related)

**Station #11: Combustion of iron in pure oxygen.** [Combustion](http://www.youtube.com/watch?v=XhhJZ55JPxo&index=27&list=UUz0cXNe-i3d-ScaN7xMx1-g)

**Station #12: Genie in a bottle.** [Genie](http://www.youtube.com/watch?v=nwhez8IEPXA&index=35&list=UUz0cXNe-i3d-ScaN7xMx1-g)

**Station #13: Halloween clock reaction.** [orange and black](http://www.youtube.com/watch?v=f30kdQsluwU&index=26&list=UUz0cXNe-i3d-ScaN7xMx1-g)

**Station #14: Fun with Sodium Acetate.** [Sodium Acetate](http://www.youtube.com/watch?v=nvHrXr5Jajg&feature=related)

**Station #15: Cold but Sublime**. [Cold](http://www.youtube.com/watch?v=K-GSrrk_ATM)

**Additional Responses: Please answer in your Science Journal.**

1. Do any of the procedures give a clue that a chemical change occurred, but are not chemical

changes? Which ones?

2. Develop a definition of chemical change using atoms and molecules in your definition. Use

complete, grammatically correct sentences.