



## PUKING PUMPKINS

### Materials:

Vinegar	Small Zip Loc Bag
Baking Soda	Plastic Spoon
Food Coloring	Paper Towels
Safety Goggles	Small Cups
Measuring Cups and Spoons	Carved Pumpkin
Dish Soap	Yeast
30 Volume Hydrogen Peroxide	Dry Ice
Tongs	Gloves
Hammer	Hot Water

### Vocabulary:

Chemical Change	Solid	Solution
Physical Change	Liquid	Mixture
Gas	Matter	Dry Ice
Endothermic Reaction	Chemistry	Sublimate
Exothermic Reaction	Acid	Base

### BAKING SODA AND VINEGAR DIRECTIONS:

1. Safety first! Put on your safety goggles!
2. Your pumpkin should already be hollowed and carved so it has a face.
3. Pour vinegar into a small cup. You will need about 1/2 a cup.
4. Add a food coloring, if you wish.
5. Fill another small cup with baking soda.
6. Add a good squirt of dish soap on top.
7. Set the cup of baking soda inside the pumpkin.
8. Quickly pour the vinegar into the pumpkin aiming for the cup of baking soda.
9. The reaction should erupt out of the pumpkin's mouth.
10. When the reaction is complete, you can dispose of the mixture in the sink and garbage can.



### ELEPHANT TOOTHPASTE DIRECTIONS:

1. Safety first! Put on your safety goggles!
2. Your pumpkin should already be hollowed and carved so it has a face.
3. Pour hydrogen peroxide into a small cup. You will need about 1/2 a cup. Be careful as hydrogen peroxide can irritate skin.
4. Add a food coloring, if you wish.
5. Add a good squirt of dish soap and gently mix.
6. Add a spoonful of yeast to another cup.
7. Add about 1/4 cup of really warm water and stir.
8. Let the mixture sit for at least 30 seconds. It should start to froth and bubble a bit.
9. Set the cup of hydrogen peroxide inside the pumpkin.
10. Quickly pour the yeast mixture into the pumpkin aiming for the cup of hydrogen peroxide. Quickly put the top back on the pumpkin and hold closed.
11. The reaction should erupt out of the pumpkin's eyes and mouth as a foam.
12. Be careful as the foam can be hot and can irritate skin.



13. When the reaction is complete, you can dispose of the mixture in the sink and garbage can.

### DRY ICE DIRECTIONS:

1. Safety first! Put on your safety goggles! Use caution when handling dry ice as it can cause injuries.
2. Your pumpkin should already be hollowed and carved so it has a face.
3. Put on gloves.
4. Use a hammer to break up the dry ice into smaller pieces.
5. Using gloved hands or tongs, move some nuggets of dry ice into a cup. Never touch dry ice with your bare hands!
6. Set the cup of dry ice inside the pumpkin.
7. Heat up some water in a cup.
8. Slowly pour the warm water into the pumpkin aiming for the cup of dry ice.
9. Put the top back on the pumpkin.
10. The fog should come out of the pumpkin's mouth and eyes.



### THE STEAM BEHIND THE EXPERIMENTS:

The Baking Soda and Vinegar Reaction is a great example of mixtures and solutions, an acid-base reaction, a physical and chemical change, an endothermic reaction, and an experiment with the different states of matter! Baking soda is a base and vinegar is an acid. When they are mixed together they create carbon dioxide gas! A physical change is when you change the way something looks but don't actually change what it is. A chemical change is when you make something new and cannot go back to the original substance. In this experiment, the physical change occurs when you dye the vinegar. The chemical change occurs when the baking soda and vinegar mix and form carbon dioxide gas! You also work with the three states of matter: solid (baking soda), liquid (vinegar and food coloring) and gas (carbon dioxide). Finally, the experiment is endothermic. This means it absorbs heat as the reaction happens and gets colder.

A mixture is two or more substances combined together in such a way that each remains unchanged. A **solution** is a specific type of mixture where one substance is dissolved into another. A **solution** is the same, or uniform, throughout which makes it a homogeneous mixture.

The Elephant Toothpaste Version is a great example of a physical and chemical change, an exothermic reaction, and an experiment with the different states of matter! When hydrogen peroxide and yeast are mixed together they release oxygen! A physical change is when you change the way something looks but don't actually change what it is. A chemical change is when you make something new and cannot go back to the original substance. In this experiment, the physical change occurs when you dye the hydrogen peroxide. The chemical change occurs when the hydrogen peroxide and yeast mix and form oxygen gas! You also work with the three states of matter: solid (yeast), liquid (hydrogen peroxide and food coloring) and gas (oxygen). Finally, the experiment is exothermic. This means it releases heat as the reaction happens and gets warmer.

The Dry Ice Version demonstrates what happens to dry ice when it is heated up. Dry ice is frozen carbon dioxide and must be 109 degrees Fahrenheit below zero in order to be solid. When dry ice heats up, instead of melting and turning from a solid to a liquid, it sublimates and turns from a solid to a gas. When warm water is added to the dry ice, a "fog" forms. It sinks as it is heavier than the air around it.

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