

# General Chemistry I – CHM1045

## (Chapter 1) Physical vs. Chemical Change

For the follow scenarios, identify whether the change is physical or chemical.

### Definition

**Physical Change:** A change that alters only the state or appearance of a substance. This is typically exhibited through odor, taste, appearance, melting point, boiling point, and density.

**Chemical Change:** A change to a substance that alters its composition into a different substance which can be achieved via reacting with other substances. This is typically exhibited through corrosion, flammability, acidity, or toxicity.

	Substance(s)	Scenario	<i>Please place an "X" for the correct type of change.</i>	
			Physical (P)	Chemical (C)
1.	Sub Sandwich	Eat it for Lunch		
2.	Milk	Made into Yogurt		
3.	Balloon	Inflated by a Machine		
4.	Rubbing Alcohol	Evaporating		
5.	Leaves	Change Color in the Fall		
6.	Leaves	Shredded		
7.	Car Window	Smashed by a Bat		
8.	Lamp Oil	Burning		
9.	Fireworks	Lite on Fourth of July		
10.	Cut Apples	Turning Brown		
11.	Gold	Melted into a Molds		
12.	Hair	Bleached by Hydrogen Peroxide		
13.	Vanilla Ice Cream	Dripping Down Your Hand		
14.	Egg	Fry it for Breakfast		
15.	Fruits	Blended with Yogurt		
16.	Water Vapor	Frosting on a Window		
17.	Fireflies	Glowing at Night		
18.	NaCl	Dissolving on French Fries		
19.	Food Scraps	Composted		
20.	Music	Heard by your Neighbor		

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## (Chapter 1) Physical vs. Chemical Change

	<i>Substance(s)</i>	<i>Scenario</i>	<i>Type of Change Explained</i>
1.	Sub Sandwich	Eat it for Lunch	This is a chemical change because the food undergoes the process of digestion. This acidic process breakdown the food into smaller molecules that the body can use. At the end of digestion the sub sandwich is not the same substance.
2.	Milk	Made into Yogurt	This is a chemical change because the milk has to be combined with bacteria and allowed to ferment in order to create a new substance (yogurt).
3.	Balloon	Inflated by a Machine	This is a physical change because the composition or make up of the balloon is not changing. It is only being stretched by air in order to be blown up.
4.	Rubbing Alcohol	Evaporating	This is a physical change because the composition or make up of the substance is not changing. The alcohol is only changing states from liquid to gas.
5.	Leaves	Change Color in the Fall	This is a chemical change because the leaves undergo a chemical reaction called photosynthesis to create different pigments.
6.	Leaves	Shredded	This is a physical change because the leaves change from a whole size into smaller pieces. There is no chemical change occurring.
7.	Car Window	Smashed by a Bat	This is a physical change because the car window's composition has not changed. It simply transitioned from one piece to several pieces.
8.	Lamp Oil	Burning	This is a chemical change because fire is involved. Fire creates a reaction between oxygen in the air to form carbon dioxide and water.
9.	Fireworks	Lite on Fourth of July	This is a chemical change because fire is used to ignite the fireworks. Through a series of combustion reactions the heat and light are given off.
10.	Cut Apples	Turning Brown	This is a chemical change because the iron molecules in the apple react with the oxygen in the air to create iron oxides (rust). This creates the browning on apples.
11.	Gold	Melted into a Jewelry Mold	This is a physical change because the gold keeps its composition, and is only changing its shape to fit the mold.
12.	Hair	Bleached by Hydrogen Peroxide	This is a chemical change because hydrogen peroxide changes the pigment molecules in the hair to another color.
13.	Vanilla Ice Cream	Dripping Down Your Hand	This is a physical change because the ice cream is not chemically changing. It simply went from a semi solid to a liquid state due to heat.
14.	Egg	Fried for Breakfast	This is a chemical change because the raw egg underwent a cooking process that changed its molecular composition. The properties of the raw egg are not the same of a cooked egg.
15.	Fruits	Blended with Yogurt	This is a physical change because the fruits are only being broken down into smaller pieces. The chemical components of the fruits are not changing.
16.	Water Vapor	Frosting on a Window	This is a physical change because the composition or make up of the substance is not changing. The water vapor is only changing states from gas to solid.
17.	Fireflies	Glowing at Night	This is a chemical reaction because light is being produced by the fireflies through a process called bioluminescence.
18.	NaCl	Dissolving on French Fries	This is a physical change because the composition of the salt has not changed.
19.	Food Scraps	Composed	This is a chemical reaction because the individual food scrapes combine with chemicals like carbon, nitrogen, and oxygen in order to be broken down in to new molecules during the composting process.
20.	Music	Heard by your Neighbor	This is a physical change because the sound is not changing just moving through different mediums (from air to concrete, and then to air).