

Chemical and Physical Change Guided Notes – Student Edition

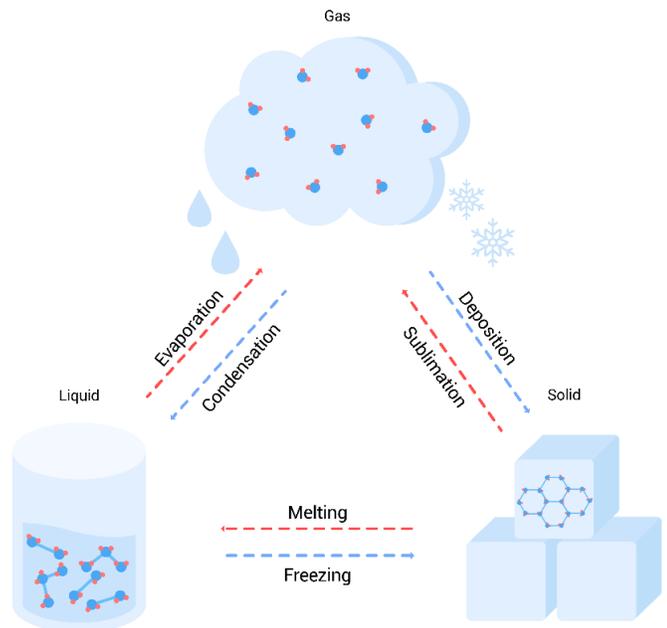
We observe many changes to the substances in our environment. These can be grouped into two types of change - _____ or _____ change.

Physical Changes

Physical changes are those which are related to the _____ properties of a substance such as a change in state, _____, or shape. In a physical change the chemical bonds holding the substance together are not _____. So, the substance remains the same but its appearance changes.

Physical changes occur when:

1. A change in the _____ of a substance occurs e.g., boiling, melting, freezing, condensing, deposition and sublimation.
2. A substance is cut, _____, mixed, _____ or torn.
3. One substance is _____ from a mixture using techniques such as distillation, evaporation, chromatography, and _____ .



In each of these situations the same substance is present before, _____ and after the physical change occurs.

Examples of Physical Change:

1. **Preparing a smoothie or shake:** Making a smoothie or a shake in a blender keeps the _____ properties of the fruits and milk intact. Over time, the fruit and milk will begin to separate out into its components again indicating it is _____.
2. **Cutting of wood or chopping fruits and vegetables:** In these processes, the chemical _____ of the fruits and vegetables remain the same and no _____ substances are made.



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3. **Boiling water (below left):** When water boils, no chemical _____ are broken, so it is a physical change. Only the state of the water changes from liquid state to vapor (gas) state. This is a _____ process, as _____ of water vapor can lead to the formation of _____ water once more.



4. **Melting ice cream (above, right) :** The same _____ is present before and after the ice cream melts, the only change has been its _____. The process can be reversed by _____ or solidification.
5. **Cracking an egg:** Both the _____ substances (the shell and the egg) are still the same before and after the egg has been cracked, the only change is that the shell is now in pieces.



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Properties of Physical Change:

1. No _____ are broken.
2. No _____ are formed.
3. Only the _____ and _____ of a substance are changed.
4. The change can be _____.

Chemical Changes

Chemical changes are those in which a _____ is formed. These changes involve chemical _____ in substances breaking and new ones forming. Another name for a chemical change is a _____. The ingredients of a chemical reaction are called the _____ and the new substances that are _____ are called the products.

Examples of Chemical Changes:

1. **Cooking and Baking:** When food is cooked the chemical _____ in the ingredients are _____ and reformed as new substances. For example, when cooking an egg, the properties of egg change and the _____ egg white becomes opaque. When baking cupcakes, the ingredients before and after cooking look, smell, and _____ much different than they did originally.



2. **Rotting of a substance:** When a substance like fruit, bread or cooked food goes rotten, various chemical _____ are broken leading to the degradation of the substance and the formation of new _____, some of which smell terrible! This is an _____ change.



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3. **Rusting (below, left):** When iron metal is exposed to air/oxygen and _____, an oxidation reaction occurs. The metal's color _____ to a brownish (rusty) orange and becomes brittle. The product called rust or iron oxide forms, which is an _____ change.



4. **Burning a candle (above, right):** When a candle burns, the fuel (_____) burns, and the products _____ and water are formed. If left longer enough the candle will be completely used up.
5. **Fireworks:** When fireworks are lit a fuel source, plus _____ from the flame cause the chemicals to _____ and form new ones. This is an irreversible change.



Properties of Chemical Changes

1. New substances are _____, original substances are _____.
2. They are _____.
3. Changes in color, _____ and the smell occur.
4. Light and _____ may be produced due to the release of _____ and _____.