**1st June, 2020 JESUS AND MARY SCHOOL AND COLLEGE Module – 3**

**CLASS – 7**

**CHEMISTRY**

**CHAPTER: PHYSICAL AND CHEMICAL CHANAGES**

**TYPES OF CHANGES:**

We know that in our day-to-day life, we experience different type of changes around us. A change is the transformation of a substance from one form to another. For example: The formationof day and night, the change of seasons, germination of seeds, the ripening of fruit, cooking of food.

1. **DESIRABLE CHANGES:**

Changes that are useful to mankind are said to be desirable changes. These are the changes which we want to occur. Examples: Curdling of milk, cooking of food, etc.

1. **UNDESIRABLE CHANGES:**

Any change that brings about destruction is an undesirable change.These are the changes which we do not want to occur. Example: Cutting of trees, rusting of iron, souring of milk etc.

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| **DESIRABLE CHANGES** | **UNDESIRABLE CHANGES** |
| Changes that are useful to mankind are said to be desirable changes. | Anything that brings about destruction is an undesirable change. |
| Examples: Curdling of milk, cooking food etc. | Examples: Cutting of trees, rotting of fruits, souring of milk etc. |

1. **REVERSIBLE CHANGES:**

Changes that can be easily reversed by removing the cause of the change are called reversible changes. **Example:** Melting of ice, stretching of rubber bands, drying of clothes etc.

1. **IRREVERSIBLE CHANGES:**

Changes that cannot be easily reversed are called irreversible changes. Example: Burning of paper, germination of seeds, bursting of crackers etc.

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| **REVERSIBLE CHANGES** | **IRREVERSIBLE CHANGES** |
| Changes that can be easily reversed by removing the cause of the change are called reversible changes. | Changes that cannot be easily reversed are called irreversible changes. |
| Examples: Melting of ice, stretching of rubber, drying of clothes etc. | Examples: Burning of matchstick, germination of seed, bursting of crackers etc. |

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1. **EXOTHERMIC CHANGES:**

A change that releases energy in the form of heat is called an exothermic change. Example: Rusting of iron, condensation of water vapour to form rain, formation of snow in clouds, making ice cubes, burning sugar, etc.

1. **ENDOTHERMIC CHANGES:**

A change that absorbs energy in the form of heat is called an endothermic change. Example: Cooking an egg, evaporation of water, conversion of frost to water vapour, melting of ice cubes, plants producing sugar by photosynthesis, etc.

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| **EXOTHERMIC CHANGES** | **ENDOTHERMIC CHANGES** |
| Changes in which heat energy is released are called exothermic changes. | Changes in which heat energy is absorbed are called endothermic changes. |
| Examples: Burning of candle, melting of ice burning of fuels. | Example: Cooking of food, boiling of water and milk etc. |

1. **SLOW CHANGES:**

Changes that take place slowly are called slow changes. Example: Germination of seeds, rusting of iron etc.

1. **FAST CHANGES:**

Changes that take place fast are called fast changes. Example: Burning of matchstick, bursting of crackers, etc.

1. **NATURAL CHANGES:**

Changes that occur naturally are called natural changes.Example: Weathering of rocks, blooming of flowers, formation of clouds etc.

1. **MAN-MADE CHANGES:**

Changes that occur to the action of human beings are called man-made changes. Example: Cutting of trees, construction of bridges, roads and dams etc.

1. **PERIODIC CHANGES:**

Changes that occur repeatedly after regular intervals of time and whose occurrence can be predicted are called periodic changes. Example: Movement of pendulum and the hands of the clocks, phases of the moon, heartbeat, motion of the earth etc.

1. **NON-PERIODIC CHANGES:**

Changes that do not repeat themselves at the regular intervals of time are called non-periodic changes. Example: Natural phenomenon like earthquakes, cyclones and volcanic eruptions.

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| **PERIODIC CHANGES** | **NON-PERIODIC CHANGES** |
| Changes that occur repeatedly after regular intervals of time and whose occurrence can be predicted are called Periodic changes. | Changes that do not repeat themselves at regular intervals of time are called non-periodic changes. |
| Example: Movement of pendulum, phases of moon, heartbeat and the hands of the clock etc. | Examples: Natural phenomenon like earthquakes, cyclones and volcanic eruptions. |

**PHYSICAL CHANGES:**

A change in which chemical composition of a substance remains the same is called a physical change. No new substance is formed. Heat or light may or may not be given out or consumed. Physical changes are temporary. Example: the change of ice into water cools, it converts into ice again, glowing of a bulb, etc.

**Characteristics of physical changes:**

1. No new substance is formed.
2. The physical change is temporary and usually reversible.
3. The chemical composition of the original substance does not change.
4. There may or may not be a change in the properties such as state, size, shape, colour, and smell of the substance that undergoes physical change.

**Terms related to physical changes:**

1. **Dissolving:** The process in which a solid such as salt or sugar when added to a liquid like water disappears in it to form a homogeneous mixture is called Dissolving.
2. **Melting:** The process of change of a solid into its liquid state at a fixed temperature is called melting.
3. **Freezing:** The process of change of a liquid into its solid state on cooling is called freezing.
4. **Boiling:**The process of change of a liquid into its gaseous state at a fixed temperature is called boiling.
5. **Evaporation:** The process in which a liquid changes into vapour state at any temperature below the boiling point is called evaporation.
6. **Condensation:** The process of change of a gas into its liquid state is called condensation.
7. **Sublimation:** The process of change of a solid to its gaseous state directly without changing into a state is known as sublimation.

**CHEMICAL CHANGES:**

A change in which the chemical composition of a substance changes is called a chemical change. A new substance is formed. Heat or light, or both, are given out or consumed. Chemical changes are permanent. Example: curdling of milk; curd cannot be turned back into milk, burning of fuel, digestion of food, etc.

**Characteristics of chemical changes:**

1. A chemical change is permanent and irreversible.
2. There is formation of one or more new substance.
3. There is a change in the net energy of the system during a chemical change.
4. The composition and properties of the new substance formed are completely different from the original substance.

**Terms related to chemical changes:**

1. **Burning or combustion:** Burning is a chemical change in which a substance combines with oxygen at a high temperature releasing light and heat. Examples: Burning of wood and burning of candles.
2. **Rusting:** Rusting is a chemical change in which iron is converted into iron oxide in the presence of water or moisture.

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| **PHYSICAL CHANGES** | **CHEMICAL CHANGES** |
| A physical change is a temporary change. | A chemical change is a permanent change. |
| The composition of a substance changes. | The composition of a substance does not change. |
| No new substance is formed. | One or more new substances are formed. |
| These changes can be reversed. | These changes cannot be reversed. |

**WORKSHEET 3**

1. **Short answer questions:**
2. What is exothermic change?
3. What is desirable change?
4. What is the definition of condensation?
5. What is rusting?
6. Write two differentiate between physical and chemical changes.
7. **Give one word for each of the following:**
8. A chemical change by which plants make their own food.
9. A change that is useful to us.
10. A change that occurs repeatedly after regular intervals of time.
11. A change that is harmful to us.
12. A change in which heat energy is released.
13. **Fill in the blanks:**
14. A physical change is temporary and \_\_\_\_\_.
15. Germination of seed is a \_\_\_\_\_ change. (Chemical/physical).
16. There is a change in the net \_\_\_\_ of the system during a chemical change.
17. The rate of evaporation \_\_\_\_ with increase in temperature.
18. Souring of milk is a (an) \_\_\_\_\_ (desirable/undesirable) change.

**NOTE:**

**Please do this work in your copies which will be checked when the school reopens. Please consider this important.**

**SOLUTION TO WORKSHEET 2 UPLOADED ON 18TH MAY:**

1. **Short answer the following questions:**
2. An element is the basic form of matter that cannot be broken down into simpler substance by chemical reactions.
3. The two difference of elements and compounds are:

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| **S. No.** | **ELEMENT** | **COMPOUND** |
| **1.** | Elements consist of same type of atoms. | Compounds are made up of two or more types of atoms chemically combines together. |
| **2.** | Elements cannot be broken down further. | A compound can be broken into simpler elements using chemical reactions. |

1. Atoms of certain elements join to form larger particles called molecules. For example: two hydrogen atom combine together to form hydrogen molecule.

**2**

1. A compound is formed when two or more elements combine chemically in a fixed proportion.
2. Helium: He

Neon: Ne

Nitrogen: N

Boron: B

Hydrogen: H

1. O: oxygen

F: fluorine

Ne: neon

B: boron

Be: beryllium

1. **Fill in the blanks:**
2. 118
3. Broken
4. 2:1
5. Elements
6. Element or a compound
7. **Write true or false for the following statements:**
8. True
9. False
10. False
11. True
12. True

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