Chapter 5 Changes around Us: Physical and Chemical Changes

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1. Which of the following statements are the characteristics of a physical change?
(i) The state of the substance may or may not change.
(ii) A substance with different properties is formed.
(iii) No new substance is formed.
(iv) The substance undergoes a chemical reaction.
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (i) and (iii)
(d) (iii) and (iv)
Answer:
(c) (i) and (iii)
The state of the substance may or may not change.
No new substance is formed.

2. Predict which of the following changes can be reversed and which cannot be reversed. If you are not sure, you may write that down. Why are you not sure about these?
(i) Stitching cloth to a shirt
Answer:
This change cannot be reversed because the cloth that is cut into pieces and stitched into a skirt cannot be returned to its original unstitched form.

(ii) Twisting of straight string
Answer:
This change can be reversed as twisted string can be easily untwisted.

(iii) Making idlis from a batter
Answer:
This change cannot be reversed because once the batter is steamed to make idlis, it cannot be turned back into batter.

(iv) Dissolving sugar in water
Answer:
This change can be reversed because sugar can be easily obtained by evaporating water from the solution.

(v) Drawing water from a well
Answer:
This change can be reversed by putting the water back into the well.

(vi) Ripening of fruits
Answer:
This change cannot be reversed because, once ripened, fruits cannot return to their unripe state.

(vii) Boiling water in an open pan
Answer:
This change can be reversed, as boiling water produces vapour, which can be condensed back into liquid water by cooling.

(viii) Rolling up a mat
Answer:
This change can be reversed because a rolled mat can be unrolled.

(ix) Grinding wheat grains to flour
Answer:
This change cannot be reversed because once wheat is ground into flour, it cannot be changed back into grains.

(x) Forming of soil from rocks
Answer:
This change cannot be reversed because once rocks break down into soil, they cannot turn back into rocks through simple physical processes.

3. State whether the following statements are True or False. In case a statement is False, write the correct statement.
(i) Melting of wax is necessary for burning a candle. (True/False)
Answer:
True

(ii) Collecting water vapour by condensing involves a chemical change. (True/False)
Answer:
False because collecting water vapour by condensing involves a physical change.

(iii) The process of converting leaves into compost is a chemical change. (True/False)
Answer:
True.

(iv) Mixing baking soda with lemon juice is a chemical change. (True/False)
Answer:
True.

4. Fill in the blanks in the following statements:
(i) Nalini observed that the handle of her cycle has got brown deposits. The brown deposits are due to _____, and this is a_____ change.

Answer:
rusting, chemical.

(ii) Folding a handkerchief is a _____ change and can be_____.
Answer:
physical, reversed.

(iii) A chemical process in which a substance reacts with oxygen with evolution of heat is called _____, and this is a _____ change.
Answer:
combustion, chemical.

(iv) Magnesium, when burnt in air, produces a substance called _____. The substance formed is _____ in nature. Burning of magnesium is a _____ change.
Answer:
magnesium oxide, basic, chemical.

5. Are the changes of water to ice and water to steam, physical or chemical? Explain.
Answer:
The conversion of water to ice and water to steam are both physical changes. These changes are reversible and involve a change in state—from liquid to solid (ice) or from liquid to gas (steam)—without changing the chemical composition of water. Each state has its own physical properties, but the substance, water, remains the same.

6. Is curdling of milk a physical or chemical change? Justify your statement.
Answer:
Curdling of milk is an irreversible chemical change. The process by which milk is converted into curd is called fermentation. In this process, a chemical reaction occurs between the lactic acid bacteria and the protein of the milk. This chemical reaction results in the formation of a new substance called curd.

7. Natural factors, such as wind, rain, etc., help in the formation of soil from rocks. Is this change physical or chemical and why?
Answer:
The formation of soil from rocks involves both physical and chemical changes.
Physical change: Natural agents like wind, rain, heat, and flowing water break down rocks into smaller pieces without altering their chemical composition.
Chemical change: Water and air react with the minerals in the rock, changing their chemical composition and contributing to the formation of soil.

8. Read the following story titled ‘Eco-friendly Prithvi’, and tick the most appropriate option(s) given in the brackets. Provide a suitable title of your choice for the story.

Prithvi is preparing a meal in the kitchen. He chops vegetables, peels potatoes, and cuts fruits (physical changes/chemical changes). He collects the seeds, fruits, and vegetable peels into a clay pot (physical change/chemical change). The fruits, vegetable peels, and other materials begin to decompose due to the action of bacteria and fungi, forming compost (physical change/chemical change). He decides to plant seeds in the compost and water them regularly. After a few days, he notices that the seeds begin to germinate and small plants start to grow, eventually blooming into colourful flowers (physical change/chemical change). His efforts are appreciated by all his family members.

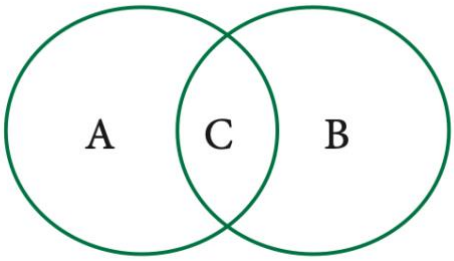
Answer:

Title: Prithvi's Kitchen Garden

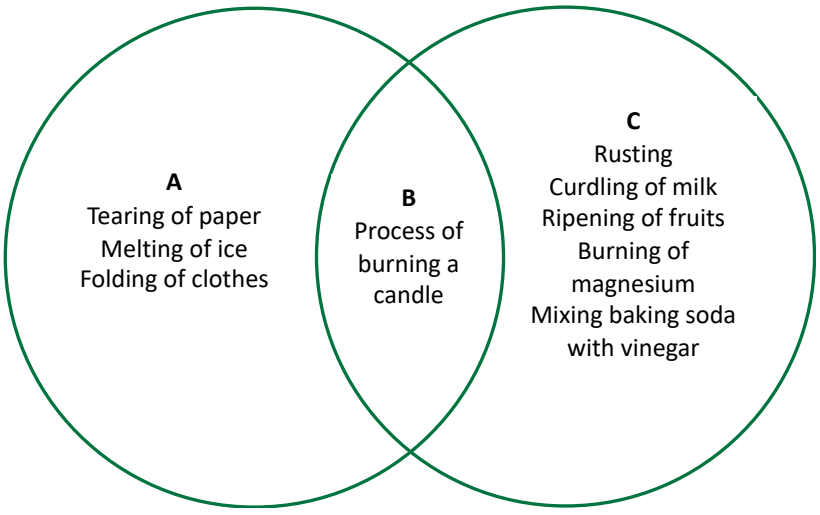
Prithvi is preparing a meal in the kitchen. He chops vegetables, peels potatoes, and cuts fruits (physical changes). He collects the seeds, fruits, and vegetable peels into a clay pot (physical change). The fruits, vegetable peels, and other materials begin to decompose due to the action of bacteria and fungi, forming compost (chemical change). He decides to plant seeds in the compost and water them regularly. After a few days, he notices that the seeds begin to germinate and small plants start to grow, eventually blooming into colourful flowers (chemical change). His efforts are appreciated by all his family members.

9. Some changes are given here. Write physical changes in the area marked 'A' and chemical changes in the area marked 'B'. Enter the changes which are both physical and chemical in the area marked 'C'.

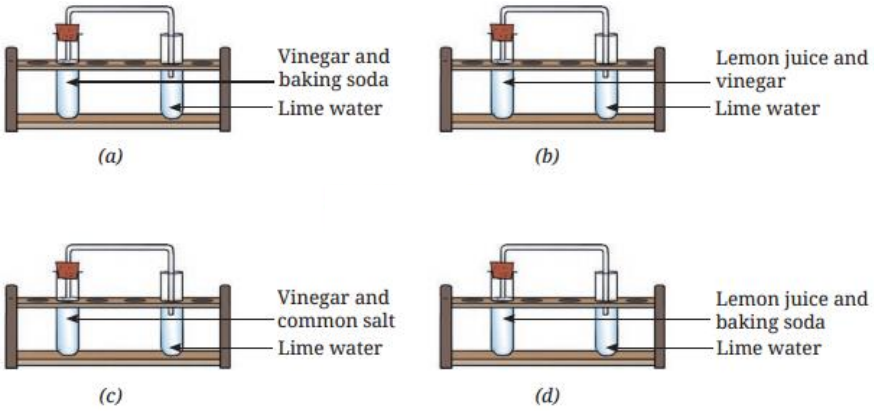
Process of burning a candle; Tearing of paper; Rusting; Curdling of milk; Ripening of fruits; Melting of ice; Folding of clothes; Burning of magnesium and Mixing baking soda with vinegar.



Answer:



11. The experiments shown in Fig. 5.11a, b, c, and d were performed. Find out in which case(s) did lime water turn milky and why?



Answer:

Lime water turned milky in experiments (a) and (d). In both experiments, vinegar or lemon juice reacted with baking soda to release carbon dioxide gas. When this gas was passed through freshly prepared lime water, it reacted with the lime water to form a white solid called calcium carbonate. This substance made the lime water turn milky.