PHYSICAL AND CHEMICAL PROPERTIES AND CHANGES

Name Marking key

**PHYSICAL PROPERTY**

1. observed with senses
2. determined without destroying matter

**CHEMICAL PROPERTY**

1. indicates how a substance reacts with something else
2. matter will be changed into a new substance after the reaction

# Identify the following as a chemical (C) or physical property (P):

P 1. blue colour

P 2. density

C 3. flammability (burns)

C 4. solubility (dissolves)

C 5. reacts with acid

C 6. supports combustion

C 7. sour taste

P 8. melting point

C 9. reacts with water

P 10. hardness

P 11. boiling point

P 12. luster

C 13. odour

C 14. reacts with air

**PHYSICAL CHANGE**

1. a change in size, shape, or state
2. no new substance is formed

**CHEMICAL CHANGE**

1. a change in the physical and chemical properties
2. a new substance is formed

# Identify the following as physical *(P)* or chemical *(C)* changes.

P 1. NaCl (Table Salt) dissolves in water.

C 2. Ag (Silver) tarnishes.

P 3. An apple is cut.

P 4. Heat changes H2O to steam.

C 5. Baking soda reacts to vinegar.

C 6. Fe (Iron) rusts.

P 7. Alcohol evaporates .

P 8. Ice melts.

C 9. Milk sours.

P 10. Sugar dissolves in water.

C 11. Wood rots.

C 12. Pancakes cook.

C 13. Grass grows.

P 14. A tire is inflated.

C 15. Food is digested.

P 16. Paper towel absorbs water.

## Part A

Physical and Chemical Changes

Can you recognize the chemical and physical changes that happen all around us? If you change the way something looks, but haven’t made a new substance, a **physical change** (P) has occurred. If the substance has been changes into another substance, a **chemical change** (C) has occurred.

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| 1. | P | An ice cube is placed in the sun. Later there is a puddle of water. Later still the puddle is gone. |
| 2. | C | Two chemical are mixed together and a gas is produced. |
| 3. | C | A bicycle changes colour as it rusts. |
| 4. | P | A solid is crushed to a powder. |
| 5. | C | Two substances are mixed and light is produced. |
| 6. | C | A piece of ice melts and reacts with sodium. |
| 7. | P | Mixing salt and pepper. |
| 8. | P | Chocolate syrup is dissolved in milk. |
| 9. | C | A marshmallow is toasted over a campfire. |
| 10. | P | A marshmallow is cut in half. |

## Part B (27 marks)

Read each scenario. Decide whether a physical or chemical change has occurred and give evidence for your decision. The first one has been done for you to use as an example.

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|  | **Scenario** | **Physical or Chemical Change?**  (1 mark) | **Evidence (2 marks for any 2 reasonable answers)** |
| 1. | Umm! A student removes a loaf of bread hot from the oven. The student cuts a slice off the loaf and spreads butter on it. | Physical | No change in substances.  No unexpected colour change, temperature change or gas given off. |
| 2. | Your friend decides to toast a piece of bread, but leaves it in the toaster too long.  The bread is black and the kitchen if full of smoke. | Chemical | Irreversible colour change  “Gas” given off  New substances formed |
| 3. | You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it. | Chemical | Colour change  New substance formed (rust)  Unexpected temperature change (exothermic) |
| 4. | You blow dry your wet hair. | Physical | No change in substances  Evaporation of water is irreversible  No colour change No gas given off |
| 5. | In baking biscuits and other quick breads, the baking powder reacts to release carbon dioxide bubbles. The carbon dioxide  bubbles cause the dough to rise. | Chemical | Gas produced  Irreversible chemical reaction  Colour change  Energy change (Endothermic reaction) |
| 6. | You take out your best silver spoons and notice that they are very dull and have some black spots. | Chemical | Colour change  New substance formed (silver oxide)  Unexpected temperature change (exothermic) |
| 7. | A straight piece of wire is coiled to form a spring. | Physical | Reversible  No change in colour  No gas given off  No temperature change |
| 8. | Food colour is dropped into water to give it colour. | Physical | No gas given off  No temperature change  Reversible as water can be evaporated off leaving food colouring behind |
| 9. | Chewing food to break it down into smaller particles represents a change, but the changing of starch into sugars by enzymes in the digestive system represents a change. | Physical  (1/2)  Chemical  (1/2) | Food only changes shape OR  No new substances formed  (1 mark)  New substances formed (sugar) OR  Colour change  (1 mark) |
| 10. | In a fireworks show, the fireworks explode giving off heat and light. | Chemical | Light produced (exothermic)  Heat produced (exothermic)  Gas produced  Sound produced  Irreversible |

**Part C: True (T) or False (F)**

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| 1. | F | Changing the size and shapes of pieces of wood would be a chemical change. |
| 2. | F | In a physical change, the chemical formula is changed. |
| 3. | T | Evaporation occurs when liquid water changes into a gas. |
| 4. | T | Evaporation is a physical change. |
| 5. | F | Burning wood is a physical change. |
| 6. | F | Combining hydrogen and oxygen to make water is a physical change. |
| 7. | T | Breaking up concrete is a physical change. |
| 8. | F | Sand being washed out to sea from the beach is a chemical change. |
| 9. | F | When ice cream melts, a chemical change occurs. |
| 10. | T | Acid rain damaging a marble statue is a chemical change. |