Changes Around Us: Physical and Chemical

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. A change in which no new substance is formed is a:

(a) neutralisation **(b)** combustion
(c) chemical change **(d)** physical change

2. Which of these is a CHEMICAL change?

(a) souring of milk into curd **(b)** grinding wheat
(c) deflating a balloon **(d)** breaking glass

3. Which of these is a PHYSICAL change?

(a) making popcorn **(b)** rusting of iron
(c) dissolving sugar in water **(d)** burning paper

4. Which of these changes can be REVERSED?

(a) melting ice **(b)** chopping vegetables
(c) making popcorn **(d)** setting curd

5. Which of these will turn lime water milky?

(a) the mixture of lemon juice and vinegar **(b)** baking soda in plain water
(c) air we breathe out **(d)** vinegar with salt

6. Pouring water on burning wood puts out the fire by removing:

(a) carbon dioxide **(b)** smoke **(c)** heat **(d)** fuel

7. A candle under a 250 mL glass went out after 21 seconds. About how long might it burn under a 750 mL glass, which holds 3 times as much air?

(a) 24 s **(b)** 21 s **(c)** 63 s **(d)** 73 s

8. A pebble of 900 g loses about 2 g each year by weathering and erosion. How much will it lose in 50 years?

(a) 100 g **(b)** 10 g **(c)** 52 g **(d)** 1,000 g

Section B — Short answer — 8 × 2 = 16 marks

9. What is the difference between a physical and a chemical change?

10. Is it a "physical" or "chemical" change? (a) cooking an egg (b) boiling water

11. Can it be reversed? Write "yes" or "no": (a) burning wood (b) blowing up a balloon

12. Will it turn lime water milky? Write "yes" or "no": (a) the gas from baking soda and vinegar (b) the mixture of lemon juice and vinegar

13. Which part of the fire triangle (fuel, oxygen or heat) does each remove? (a) throwing sand on a small fire (b) pouring water on burning wood

14. Each spoon of baking soda used in a fizz test weighs 7 g. A class does 4 tests with 2 spoons each. How much baking soda is used?

15. A candle weighed 119 g before burning and 64 g after. How much wax was used up? Is the burning a physical or a chemical change?

16. Curd took 18 hours to set in winter and 9 hours in summer. How many hours faster in summer? Is setting of curd physical or chemical?

Section C — Word problems — 4 × 4 = 16 marks

17. Explain the physical and chemical changes in a burning candle.

18. Sort into physical and chemical changes, with a reason for one of each: crushing chalk, freezing water, burning paper, dissolving sugar in water, rotting of food, making popcorn.

19. Three set-ups pass these into lime water: (1) the mixture of lemon juice and vinegar; (2) tap water; (3) vinegar with salt. Which turn it milky, and what does that show? Name the substance that makes it milky.

20. A candle burns 25 s under a small glass and 75 s under a glass three times as big. (a) Why does it go out? (b) Why does it last longer under the big glass? (c) Name the three things a fire needs. (d) How does a blanket put out a fire on clothes?

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Answer key

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Q	Answer	Working
1	**(d) physical change**	—
2	**(a) souring of milk into curd**	—
3	**(c) dissolving sugar in water**	—
4	**(a) melting ice**	—
5	**(c) air we breathe out**	—
6	**(c) heat**	—
7	**(c) 63 s**	21 × 3 = 63
8	**(a) 100 g**	2 × 50 = 100
9	**In a physical change no new substance forms; in a chemical change a new substance forms.**	—
10	**(a) chemical (b) physical**	—
11	**(a) no (b) yes**	—
12	**(a) yes (b) no**	—
13	**(a) oxygen (b) heat**	—
14	**56 g**	7 × 2 × 4 = 56
15	**55 g; chemical (the wax vapour burns to form new substances; melting is physical)**	119 − 64 = 55
16	**9 hours; chemical**	18 − 9 = 9
17	**Physical: the wax melts, flows down and some evaporates into wax vapour. Chemical: the wax vapour burns with oxygen, giving heat, light, carbon dioxide and water vapour. So a burning candle shows both kinds of change.**	—
18	**Physical: crushing chalk, freezing water, dissolving sugar in water. Chemical: burning paper, rotting of food, making popcorn. In a chemical change a new substance forms; in a physical change it does not.**	—
19	**(1) no change; (2) no change; (3) no change. Milky lime water shows carbon dioxide; the milkiness is calcium carbonate.**	—

Q	Answer	Working
20	**(a) It uses up the oxygen. (b) The big glass holds more air, so more oxygen. (c) Fuel, oxygen and heat. (d) It cuts off the oxygen.**	—