Science 9 Review: Answers

Part 1

1. You should tie back loose clothing, wear safety goggles, wear closed-toe shoes, and tie back long hair.

2. This is a chemical change, as a gas and a new substance was formed.

3. Chart should be similar to chart on page 103 in the student book.

4. Physical properties of ice cream include: its colour, melts around 0°C, hardness – soft, density and conductivity – none.

5. Answers will vary, but should show evidence of being able to describe the differences between physical and chemical changes. Students should also indicate that knowing about these changes helps one to find potential applications for these changes. For example, baking soda is used in cooking because the carbon dioxide gas can help cakes and bread rise.

6. Plaster of Paris

7. Dalton viewed the atom as a solid ball—like a billiard ball. Bohr viewed the atom as electrons orbiting the nucleus in specific orbits.

8. Lavoisier was "the father of chemistry" because of his experimental and theoretical work, which included devising a naming system for chemicals.

9.

Na	11	23.0
Br	35	83.8
S	16	32.1

10. Mendeleev's work on the periodic table represented his contribution, which was a continuation of the work of others. Students should indicate that Mendeleev's work was the result of his creativity, hard work, and inspiration, but the basis of his work came from the efforts of previous researchers. Mendeleev grouped the elements according to a pattern.

11. a) ionic

b) molecular

c) ionic

12. a) magnesium, oxygen

b) iron, fluorine

c) carbon, oxygen

13. a) magnesium oxide

b) iron(II) fluoride

c) carbon dioxide

14. By studying ionic and molecular compounds, it is possible to learn how these atoms interact with each other. This can lead to a greater understanding of how the atoms combine at the atomic level to form compounds.

15. Answers could include combustion, cellular respiration, corrosion, or any other oxidizing reaction discussed in class.

16. $FeS + HCl \rightarrow FeCl_2 + H_2S$ also $FeS + HCl \rightarrow FeCl + HS$ (unbalanced)

17. $MgCl_2 + Li_2O \rightarrow 2LiCl + MgO$ also $MgCl + LiO \rightarrow LiCl + MgO$ (unbalanced)

18. An enzyme is an organic catalyst made of protein, and functions in living things to influence the rate of biological reactions. An inorganic catalyst can influence the rate of a reaction in a non-living system. (Note: This is extension material.)

19. Answers will vary, but should reflect the work covered in this section. For example, many students are surprised by the action of a catalyst or the law of conservation of mass.

20. a) Aristotle described all matter as being made of earth, air, fire, and water.

b) Nagaoka described matter as being negatively charged electrons orbiting a positively charged nucleus.

c) Chadwick described the nucleus as having positively charged protons and neutral neutrons. (Note: b) and c) are not required material.)

21. a) Alkali families are the most reactive metals.

b) Halogens are the most reactive non-metals.

c) Noble gases are stable elements.

22. a) two sodium, one oxygen

b) one aluminum, three fluorine

c) three magnesium, two phosphorus

23. a) $2\ Na_{(s)} + F_{2(g)} \rightarrow 2\ NaF_{(s)}$ also $Na_{(s)} + F_{(g)} \rightarrow NaF_{(s)}$ (unbalanced)

b) $2\ HgO_{(s)} \rightarrow 2\ Hg_{(l)} + O_{2(g)}$ also $HgO_{(s)} \rightarrow Hg_{(l)} + O_{2(g)}$ (unbalanced)

24. Yes. The masses were different only because 2 g of gas escaped.

25. Group 1—Element D

Group 2—Element M

Group 3—Element G

Group 4—Element Q

Group 5—Element A

Group 6—Element E

Group 7—Element L

Group 8—Element J

26. Hypothermia occurs when the human body gets too cold. The cooler temperatures slow down the chemical reactions that occur in the body.

27. Combustion and corrosion are chemical reactions that involve oxygen.

28. Answers will vary, but could include an outline of the history of the development of the theory of the atom or the development of the periodic table.

