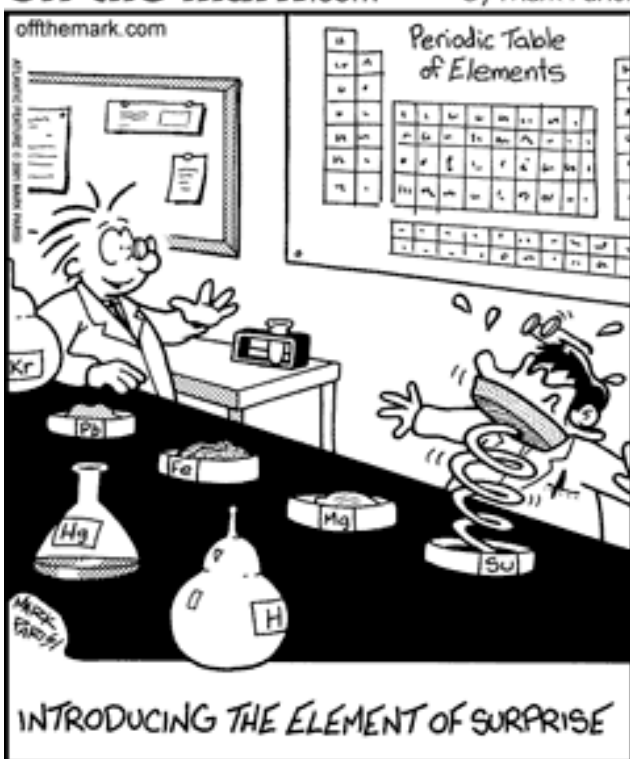


Grade 9

Matter and Chemical Change

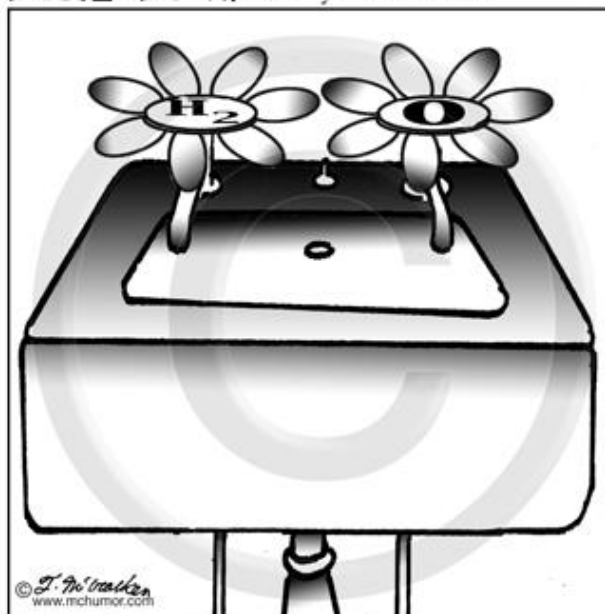
Practice Questions

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1. Matter is defined as:
 - a. anything that has mass and is a solid, liquid or gas.
 - b. anything that has weight and occupies space.
 - c. anything that has weight and occupies area.
 - d. anything that has mass and occupies space.

2. Jose was given a list of statements pertaining to behavior in the science lab. His teacher told him to follow all except one. Which one is not a safe practice?
 - a. Do not taste anything in the lab.
 - b. Always look at containers from the top.
 - c. Tie back loose hair and roll up long sleeves.
 - d. Wear safety goggles when working with chemicals.

Use the diagram below to answer the next question

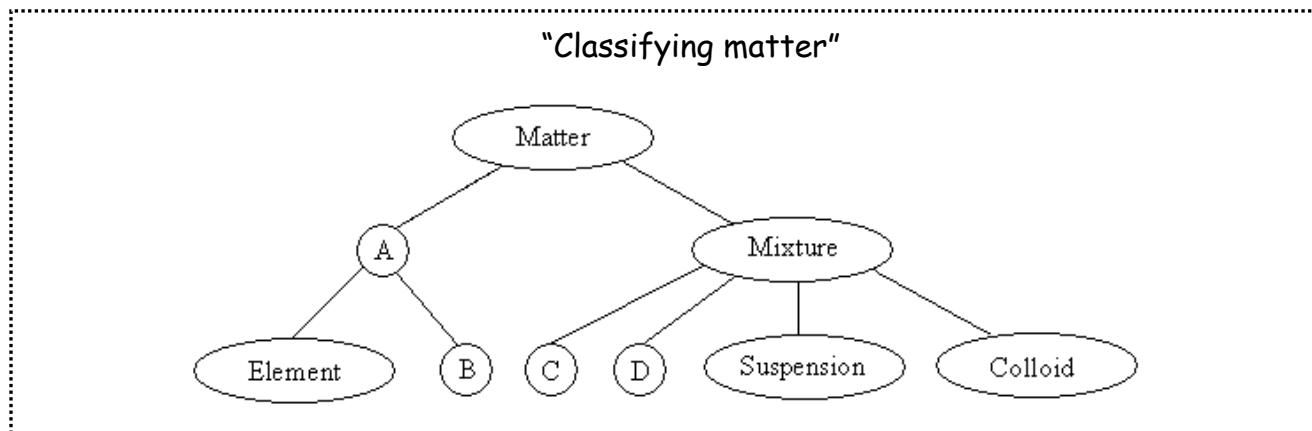


3. What does symbol above, represent?
 - a. corrosive material
 - b. biohazardous infectious material
 - c. poisonous and infectious substance
 - d. flammable and combustible material
-
4. An ice cube placed on a lab station counter becomes a pool of water. What term best describes this change in state?
 - a. melting
 - b. freezing
 - c. sublimation
 - d. condensation

 5. A chunk of dry ice, placed in a beaker, disappears leaving no trace of a wet spot. The dry ice changed state through the process of
 - a. melting.
 - b. freezing.
 - c. deposition.
 - d. sublimation.

 6. Two or more elements chemically combined in definite proportions best describes
 - a. an atom.
 - b. a solution.
 - c. a compound.
 - d. a mechanical mixture.

Use the information below to answer the next question



7. What does the category labeled A represent?
- mechanical mixture
 - pure substance
 - solution
 - compound

Use the following information to answer the next question

To help identify substance X, Mark listed four properties:

- is soluble in water
- appears to be a white crystal
- has a boiling point of 1465°C
- reacts with acid to form bubbles

8. Determine how many of the properties were chemical and physical.
- 3 chemical, 1 physical
 - 1 chemical, 3 physical
 - 2 chemical, 2 physical
 - 4 chemical, 0 physical
-
9. The MSDS lists methane as having a boiling point of -162°C and a melting point of -183°C . What state does methane exist as at -100°C ?
- gas
 - solid
 - liquid
 - liquid/solid mixture
10. The term precipitate is often associated with chemical change. Precipitate refers to
- release of light.
 - formation of a gas.
 - formation of a solid.
 - extremely strong odour.

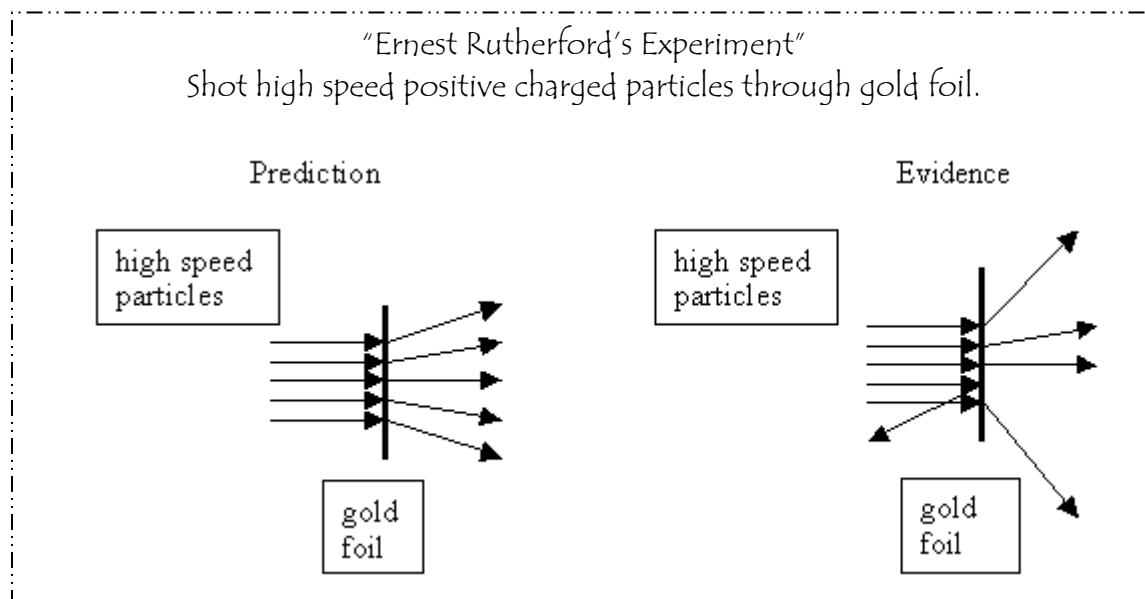
Use the information below to answer the next question

Various combinations of four substances (W, X, Y, and Z) were observed and the results were recorded in a chart.

Combination	Combination of substances	Observations after mixing
A	X with Y	Produced a strong odour
B	X with W	Fizzing occurred
C	W with Z	Colour became a lighter red
D	Y with Z	Both melted

11. Which combinations clearly indicate a physical change?
- A & B
 - A & D
 - B & C
 - C & D

Use the information below to answer the next question



12. Rutherford's experiment suggested that...
- the atom is mostly empty space with a negatively charged nucleus.
 - the atom is mostly empty space with a positively charged nucleus.
 - the atom is very compact with a negatively charged nucleus.
 - the atom is very compact with a positively charged nucleus.

Use the information below to answer the next question

Characteristics of atomic particles were discussed in a science class and then compiled into a chart.

Property	Proton	Electron	Neutron
Mass	X	light	heavy
Charge	+	Y	no charge
Location	nucleus	orbits	Z

13. The students correctly filled in X, Y, and Z, respectively, as

- light, -, orbits.
- heavy, -, orbits.
- light, +, nucleus.
- heavy, -, nucleus.

14. What does the atomic number of an atom represent?

- The number of neutrons / electrons.
- The number of protons / electrons.
- The number of protons / neutrons.
- The number of electrons / shells.

Use the following information to answer the following 2 questions.

The following information comes from an alien periodic table that follows all the same patterns as a periodic table on Earth.

Name	Eeny	Meeny	Miny	Mo
Atomic Number	6		8	
Atomic Mass	12		16	

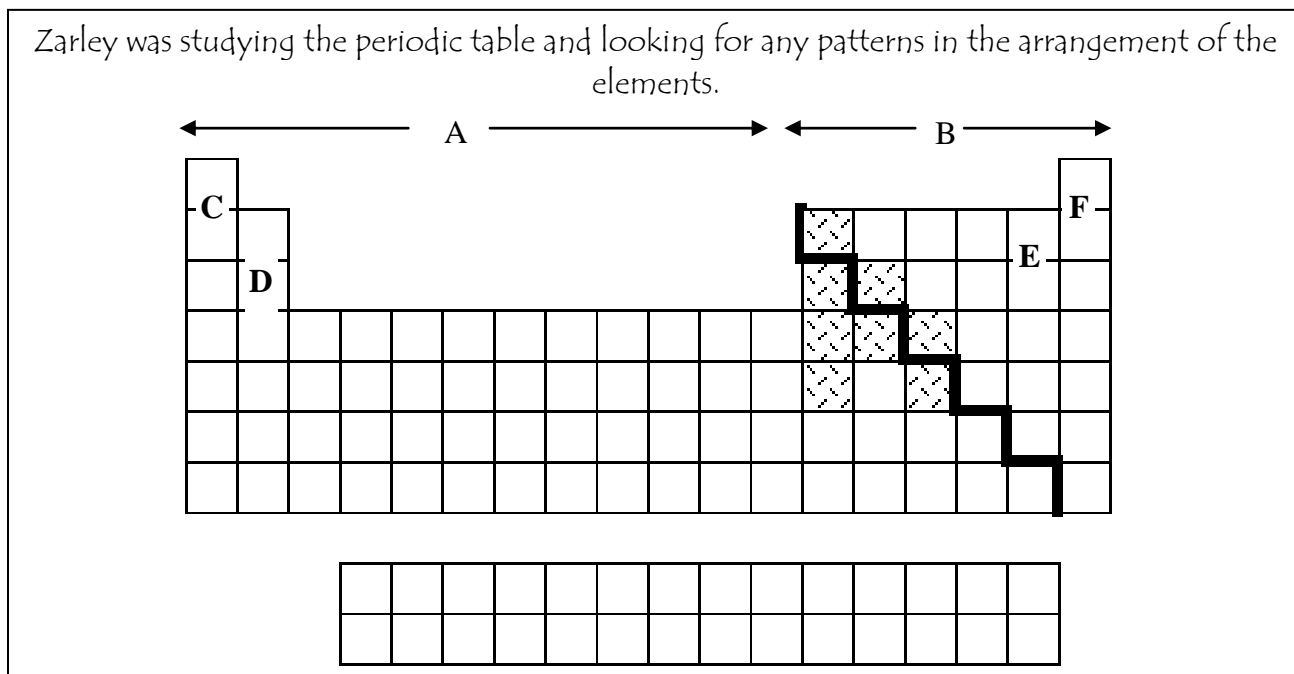
15. What would be the atomic number and approximate atomic mass for the element Meeny?

- atomic number = 6, atomic mass = 12
- atomic number = 7, atomic mass = 14
- atomic number = 7, atomic mass = 18
- atomic number = 8, atomic mass = 16

16. How many electrons, protons, and neutrons, respectively, would an atom of the element Eeny have?

- 6, 6, 6
- 6, 12, 6
- 6, 6, 12
- 6, 12, 12

Use the following diagram to answer then next 4 questions



17. Zarley noticed that the periodic table was separated into two large sections by a “staircase”. The elements in Section A would have the following characteristics:
 - a. brittle and low boiling points.
 - b. are solids and good conductors.
 - c. are gases and good conductors.
 - d. exist in all three states and are good insulators.

18. Zarley also noted that similar elements were arranged in columns. In which column are the noble gases found?
 - a. C
 - b. D
 - c. E
 - d. F

19. Zarley noticed that the periodic table had coloured sections. The seven elements between the metal and the non-metal sections had their own colour. They represent a group called
 - a. halogens.
 - b. metalloids.
 - c. intermediates.
 - d. mid-elements.

20. While examining a section of the periodic table, Zarley noticed that Hg and Br were written in blue print while the other elements were written in black or red print. How did he explain this?
 - a. Hg and Br are the heaviest element.
 - b. Hg and Br are the most reactive element.
 - c. Hg and Br are the most poisonous element.
 - d. Hg and Br are in a liquid state at room temperature.

Use the following table to answer the next question.

“Unknown elements and their physical and chemical properties.”

Element	Colour	Melting Point (°C)	Boiling Point (°C)	Other Properties
“A”	silvery	181	1342	reacts with water
“B”	silvery	-9	357	poor heat conductor
“C”	silvery	232	2602	malleable, ductile
“D”	silvery	98	883	reacts with water
“E”	grey	1538	2861	reacts with moist air

21. Based on similar characteristics, a student decided to put these two elements in the same grouping.
- “A”, “B”
 - “D”, “E”
 - “D”, “C”
 - “A”, “D”
-

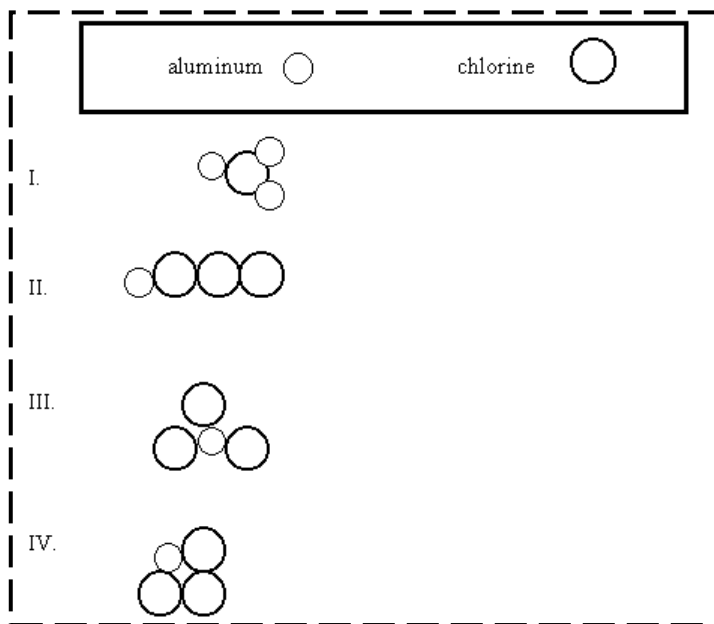
Use the following information to answer the next question.

Physical Properties of 5 Different Elements

Element 1	shiny, silver solid
Element 2	brittle, dull solid
Element 3	hard solid, conducts electricity
Element 4	shiny, high-boiling-point liquid
Element 5	non-conducting gas

22. Which elements are metals?
- 1 and 2
 - 1, 4 and 5
 - 2, 3 and 4
 - 1, 3 and 4
-
23. The chemical formula for acetic acid is $\text{HC}_2\text{H}_3\text{O}_2$. How many atoms of each element are present?
- 4 hydrogen, 2 carbon, and 2 oxygen
 - 1 hydrogen, 2 carbon, and 2 oxygen
 - 3 hydrogen, 2 carbon, and 2 oxygen
 - 1 hydrogen, 1 carbon, and 1 oxygen
24. MSG or monosodium glutamate is a flavour enhancer. It consists of 5 atoms of carbon, 8 atoms of hydrogen, 1 atom of nitrogen, 4 atoms of oxygen, and 1 atom of sodium. What is the chemical formula for MSG?
- $5\text{CH}_8\text{NO}_4\text{Na}(\text{s})$
 - $\text{C}_5\text{H}_8\text{NO}_4\text{Na}(\text{s})$
 - $5\text{CH}_8\text{N}_4\text{OS}(\text{s})$
 - $\text{C}_5\text{H}_8\text{NO}_4\text{S}(\text{s})$

25. Magnesium nitride is a compound made up of
- 2 elements and 2 atoms.
 - 2 elements and 4 atoms.
 - 2 elements and 5 atoms.
 - 2 elements and 6 atoms.
26. Which illustration best represents a simplified diagram of AlCl_3 ?



- I
 - II
 - III
 - IV
27. Alex made a copper (II) sulfate solution by mixing copper (II) sulfate crystals with water. This copper (II) sulfate solution is written as
- CuSO_4 (g).
 - Cu_2SO_4 (l).
 - Cu_2SO_4 (s).
 - CuSO_4 (aq).
28. Carbon monoxide is a deadly gas that reduces the amount of oxygen carried by the blood. The correct formula for carbon monoxide is
- CO (g).
 - CO_2 (g).
 - C_2O (g).
 - C_2O_2 (g).
29. N_2Cl_4 would have the following chemical name...
- nitrogen chloride.
 - dinitrogen chloride.
 - nitrogen tetrachloride.
 - dinitrogen tetrachloride.

Use the following information to answer the following question.

An unknown compound was discovered to have the formula X_2O_3 .

30. What is the ion charge of the unknown element X?
- 2+
 - 2-
 - 3+
 - 3-
-
31. The combination of baking soda and acetic acid forms water and carbon dioxide. What is the correct word equation for this reaction?
- acetic acid \rightarrow water + carbon dioxide
 - acetic acid + water \rightarrow carbon dioxide
 - baking soda \rightarrow water + carbon dioxide
 - baking soda + acetic acid \rightarrow water + carbon dioxide
32. Marble buildings are affected by acid rain. When marble ($CaCO_3$) reacts with the acid, calcium chloride, carbon dioxide, and water are the products formed. Which of the following equations describes this reaction?
- $CaCl_2 + H_2O \rightarrow CO_3 + 2HCl + CO_2$
 - $H_2O + 2HCl \rightarrow CaCl_2 + CO_2 + CaCO_3$
 - $CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$
 - $CaCO_3 + H_2O \rightarrow CaCl_2 + 2HCl + CO_2$

Use the following information to answer the next 2 questions.

You observe a metal being placed into a beaker of green coloured acid. Very soon, a gas is being given off, the green colour begins to fade, and the temperature of the solution in the beaker increases.

33. Which of the following observations was evidence that a chemical change took place?
- metal melting
 - metal dissolving
 - gas being produced
 - temperature decreased
34. Which statement best describes the type of change that took place?
- exothermic chemical reaction
 - endothermic chemical reaction
 - endothermic corrosion reaction
 - exothermic respiration reaction
-

Use the following information to answer the next 2 questions.

Reaction A: calcium carbonate + hydrochloric acid \rightarrow calcium chloride + hydrogen gas

Reaction B: sugar + oxygen \rightarrow carbon dioxide + water

Reaction C: iron + oxygen \rightarrow iron oxide

Reaction D: lead nitrate + potassium iodide \rightarrow lead iodide + potassium nitrate

35. Which reaction would fizz when it occurs?
- Reaction A
 - Reaction B
 - Reaction C
 - Reaction D
36. Salt is placed on icy city streets in the winter. The long term effect is the rusting (corrosion) of the vehicle's fender. Which reaction above indicates this?
- Reaction A
 - Reaction B
 - Reaction C
 - Reaction D

Use the following information to answer the following question.

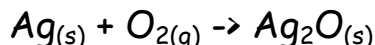
In an experiment, Nicole and Erik add 40 g of lead(II) nitrate to 36 g of sodium iodide. They use a 150 mL beaker having a mass of 100 g for the reaction and a measuring scale to find the mass of the reactants and products.

37. If no gases were produced in this reaction, what is the total mass of the products?
- 40 g
 - 36 g
 - 76 g
 - 176 g
38. For your first trial with a reaction, you used cold acetic acid and small chunks of baking soda. The reaction took 30 s to complete. Which of the following suggestions would increase the rate of the reaction?
- Crush the baking soda.
 - Add water to the mixture
 - Decrease the temperature of acetic acid.
 - Decrease the concentration of the acetic acid.

Use the following information to answer the following 2 questions.

Laura's mom was busy preparing for your family's Christmas feast. When she took out the silverware (that hadn't been used since last Christmas!) she noticed that it was tarnished (turned black). Laura was given the job of polishing it up before everyone arrived - fun!

As she was polishing it up, she began to think about how this chemical reaction occurred and came up with the following equation to explain why she was spending her time polishing silverware instead of playing Rock Band II that she got from Santa!



39. What is the evidence that a chemical reaction has occurred?
- A gas was produced
 - A color change occurred.
 - Heat was given off during the reaction
 - An odor was given off during the reaction
40. How would the mass of the tarnished silverware piece compare to the original silverware piece?
- The tarnished silverware piece would have the same mass.
 - The tarnished silverware piece would have a greater mass.
 - The tarnished silverware piece would have a lesser mass.
 - It is impossible to predict the difference in the masses.

Answers:

- | | | |
|-------|-------|-------|
| 1. D | 15. B | 29. D |
| 2. B | 16. A | 30. C |
| 3. A | 17. C | 31. D |
| 4. A | 18. D | 32. C |
| 5. D | 19. C | 33. C |
| 6. C | 20. D | 34. A |
| 7. B | 21. D | 35. A |
| 8. B | 22. D | 36. C |
| 9. A | 23. A | 37. C |
| 10. D | 24. B | 38. A |
| 11. C | 25. C | 39. B |
| 12. B | 26. C | 40. B |
| 13. D | 27. D | |
| 14. B | 28. A | |