

## Decide

1

Which elements are the most malleable and ductile?

- A. Metals
- B. Non-Metals
- C. Metalloids

## Decide & Explain

2

Which of the following is the least dense? Explain your reasoning.

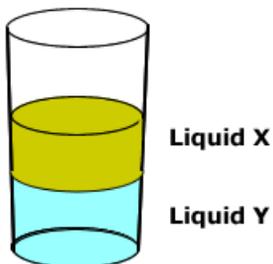
- A. Chlorine bleach
- B. Chlorine tablets
- C. Chlorine Liquid
- D. Chlorine Gas

## Decide

3

Liquid X & Liquid Y were poured into the same container and allowed to separate as shown below. Which of the following explains the difference?

- A. Liquid X is soluble in Liquid Y, and Liquid X is denser than Liquid Y.
- B. Liquid Y is soluble in Liquid X, and Liquid Y is denser than Liquid X.
- C. The two liquids are insoluble together, and Liquid X is denser than Liquid Y.
- D. The two liquids are insoluble together, and Liquid Y is denser than Liquid X.



## Decide

4

Which elements have the lowest densities?

- A. metals
- B. nonmetals
- C. metalloids
- D. noble gases

## Find & Decide

5

Find the names of each of the following elements on the periodic table:

Ag, As, Ca, Cl, I, Ir, Si, Ti.

Classify each element as a metal, nonmetal, or metalloid.

## Classify

6

Except during World War II when steel pennies were made, pennies minted before 1984 were made entirely of copper. Pennies made later have a core of zinc covered by a thin layer of copper. Nickels contain about 25% copper and 75% nickel. Classify each type of coin in terms of elements, compounds, homogeneous mixtures, and heterogeneous mixtures.

## Give Examples

7

Give four examples of properties of nonmetals that are exactly the opposite of properties of metals.

## Decide

8

Which two are physical properties?

- A. state of matter
- B. acidity
- C. reactivity with water
- D. heat of combustion
- E. melting point

## Decide

9

Which two are properties of bases?

- A. They react with metals to produce hydrogen gas.
- B. They have a sour taste.
- C. They accept hydrogen ions.
- D. They have a pH greater than 7.
- E. They are flammable.

## Decide

10

Solution X is a strong acid with a pH of

1. Solution X is mixed with solution Y, and the pH of the resulting mixture is approximately 6.

Based on this information, how should solution Y be classified?

- A. neutral solution
- B. weak acid
- C. strong base
- D. strong acid

## Decide

11

Which statement is true?

- A. Less reactive substances will not undergo chemical reactions.
- B. Reactivity is the rate at which a substance undergoes a chemical reaction.
- C. A substance's reactivity is determined by its location in the periodic table.
- D. Every element in the periodic table reacts strongly with water

## Explain

12

An observer noticed a large oil tanker parked at an oil terminal for two days. On the second day, more of the hull of the ship was visible. Was the tanker picking up oil from the terminal or delivering oil to the terminal? Explain your answer.

## Identify

13

Clara went to a salon to get her hair trimmed, bleached, and braided. Identify which of these processes involves a chemical change and a physical change. Explain your answers.

## Decide

14

Which two are properties of acids?

- A. They have a soapy texture.
- B. They are corrosive.
- C. They have a bitter taste.
- D. They accept hydrogen ions.
- E. They have a pH less than 7.

## List

15

List how many atoms of each element are in the compound potassium carbonate ( $K_2CO_3$ )?

## List

16

List how many atoms of each element are in the compound Sodium Sulfate ( $Na_2SO_4$ )?

**Decide**

5

**Decide**

6

**Decide**

7

**Decide**

8

## Decide

17

For which of these substances is an atom the smallest unit that maintains the characteristics of the substance?

- A. sodium
- B. carbohydrate
- C. carbon monoxide
- D. olive oil

## Decide

18

Which of the following is a compound?

- A. sodium
- B. carbon
- C. ammonia
- D. helium

## Explain

19

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

## Explain

20

Define the law of conservation of mass and explain how it relates to physical and chemical changes.

## Identify

21

Identify the charge on the nucleus and on the electrons of an atom.

## Draw

22

Draw the electron dot diagrams for the first 5 elements of the periodic table.

## List

23

Below is a formula for aspirin, or acetylsalicylic acid.  
List the name of each element that appears in the formula and give the number of atoms of each element present.



## Define

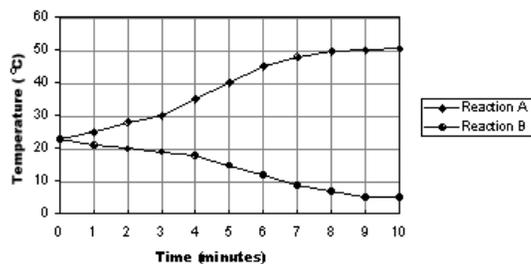
24

What is neutralization?

## Decide

25

Use the diagram to answer each question.



1. How did the temperature change in reaction A differ from that in reaction B?
2. Which reaction is endothermic? Explain your reasoning.

## Explain

26

Explain the difference between a mixture & a compound.

## Decide

27

Is the melting of an ice cube considered a physical change or a chemical change?  
Explain your reasoning.

## Complete

28

What do each of the Question Marks stand

*Atoms of Some Common Elements*

| Element    | Atomic Number | Mass Number | Protons | Neutrons | Electrons |
|------------|---------------|-------------|---------|----------|-----------|
| Sodium     | 11            | ?           | 11      | 12       | ?         |
| Magnesium  | 12            | 24          | 12      | ?        | 12        |
| Aluminum   | ?             | 27          | 13      | 14       | 13        |
| Phosphorus | 15            | 31          | ?       | 16       | 15        |

## Draw

29

Draw a picture that shows the motion of helium atoms in each state:

- A. Solid
- B. Liquid
- C. Gas

## Decide

30

Label each example of chemical change with its evidence a chemical change occurred.

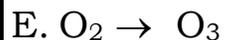
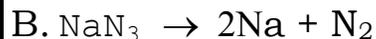
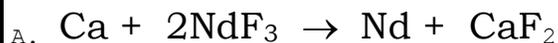
*(formation of gas or solid, change in color or odor, release of light & heat., new substance formed)*

- A. Burning wood in a fireplace
- B. Fireworks Exploding
- C. Food spoiling
- D. Baking soda reacts with vinegar & bubbles
- E. Methanol is burned and leaves a residue
- F. A bicycle chain rusts

## Balance

31

Balance the following equations:



## Explain

32

What is the difference between an ionic & covalent bond?

## Decide

33

List three physical properties of copper

## Explain

34

Explain the movement of speed of particles in a solid versus the speed of particles in a gas.

## Explain

35

Explain, using Charles's law, why a hot air balloon needs a gas burner in order to work.

## Calculate

36

The formula for density is mass/volume. Calculate the density for the following items:

| Name of Material | Mass of the Material in grams | Volume of material in cm <sup>3</sup> |
|------------------|-------------------------------|---------------------------------------|
| Gold             | 965.0 g                       | 50.0 cm <sup>3</sup>                  |
| Styrofoam        | 100.0 g                       | 1000.0 cm <sup>3</sup>                |
| Table Salt       | 25.0 g                        | 11.6 cm <sup>3</sup>                  |
| A wooden 2x4     | 1240.0 g                      | 2500.0 cm <sup>3</sup>                |

## Explain

37

Explain in terms of Archimedes' principle why a piece of wood floats in water.

## Explain

38

You are driving a compact car along the freeway and decide to pass a slow-moving moving van.

As your car passes close to the van, you feel as if your car is pulled toward the van. Explain using Bernoulli's principle.

## Decide

39

Identify each substance as either a Fluid or Non-Fluid

1. cloth
2. water
3. ice
4. paper
5. soup
6. motor oil
7. helium
8. plasma
9. paper clip
10. wet paint

## Decide

40

Label each as either Bernoulli's Principle or Pascal's Principle.

1. Hydraulic lift at an auto repair garage
2. smoke drawn up a chimney
3. Airplane wing lifts when the air above the wing moves faster than the air below it.
4. A u-shaped tube is filled with water and the two ends are capped with pistons. When one piston is pressed down, the other piston rises.
5. When you blow across the top of a piece of paper, the paper rises.
6. Blowing up a balloon by introducing air in one spot, stretches out the whole balloon.
7. Putting a spin on a baseball causes it to curve.