CHEMICAL vs. PHYSICAL CHANGE

Name _____

In a physical change, the original substance still exists, it has only changed in form. Energy changes usually do not accompany physical changes, except in phase changes and when substances dissolve.

In a chemical change, a new substance is produced. Energy changes always accompany chemical changes. Physical changes usually accompany chemical changes.

Classify the following as being either a chemical or a physical change.

1. Sodium chloride dissolves in water. _____
2. Hydrochloric acid reacts with sodium hydroxide to produce a salt, water and heat. _____
3. A pellet of sodium is sliced in half. _____
4. Water is heated and changed to steam. _____
5. Food is digested. _____
6. Starch molecules are formed from smaller glucose molecules. _____
7. Ice melts. _____
8. Plant leaves lose water through evaporation. _____
9. A red blood cell placed in distilled water will swell and burst. _____
10. The energy in food molecules is transferred into molecules of ATP. _____
11. The roots of a plant absorb water. _____
12. Iron rusts. _____
13. Oxygen is incorporated into hemoglobin to bring it to the cells. _____
14. A person gets cooler by perspiring. _____
15. Proteins are made from amino acids. _____
16. A match burns. _____
17. A toothpick is broken in half. _____

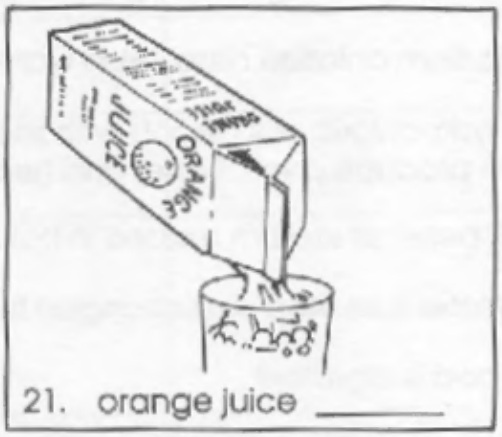
ELEMENTS, COMPOUNDS AND MIXTURES

Name _____

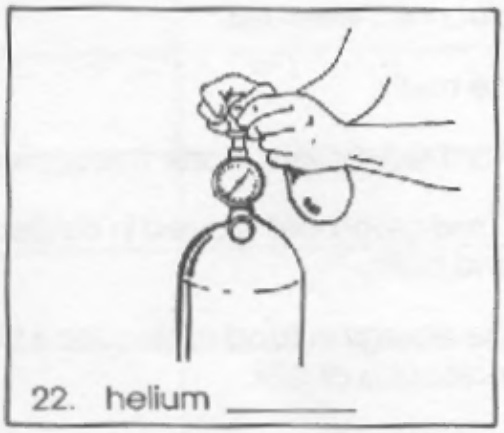
An element consists of only one kind of atom. A compound consists of two or more different elements chemically combined in a fixed ratio. The components of a mixture can be in any proportion and are not chemically bound.

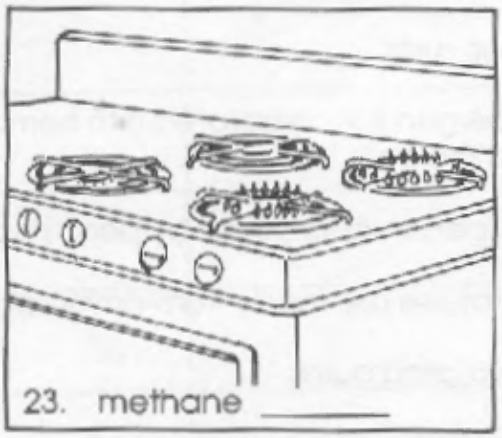
Classify each of the following as an element, compound or mixture by writing E, C or M in the space provided.

1. sodium _____
2. water _____
3. soil _____
4. coffee _____
5. oxygen _____
6. alcohol _____
7. carbon dioxide _____
8. cake batter _____
9. air _____
10. soap _____
11. iron _____
12. salt water _____
13. ice cream _____
14. nitrogen _____
15. eggs _____
16. blood _____
17. table salt _____
18. nail polish _____
19. milk _____
20. cola _____



21. orange juice _____

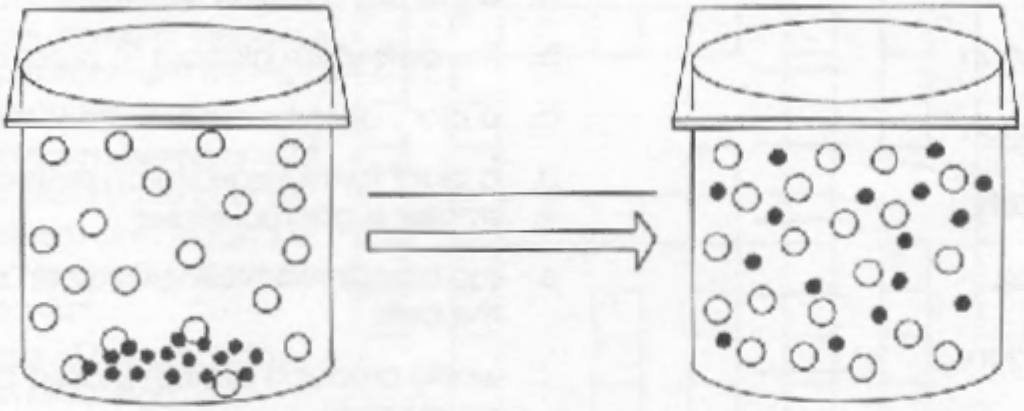

22. helium _____

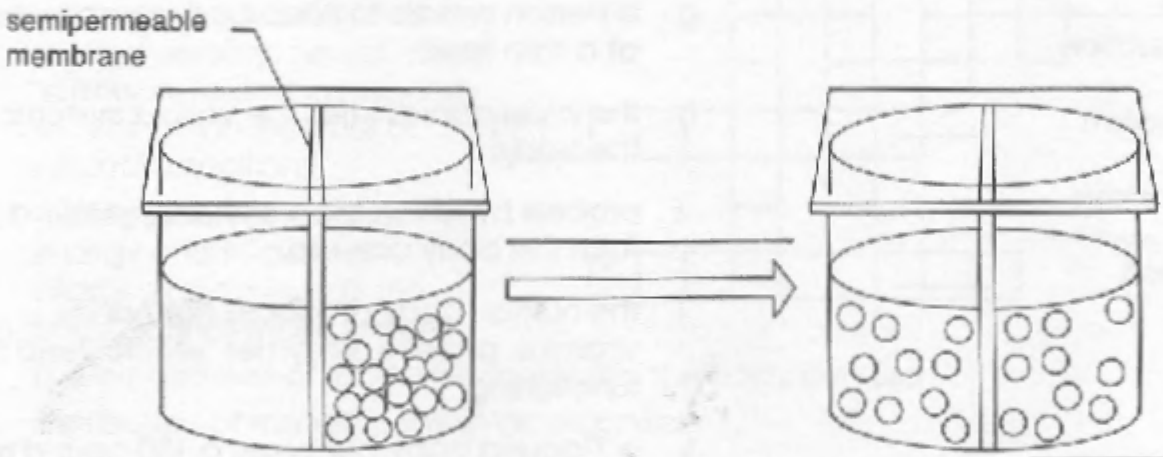

23. methane _____

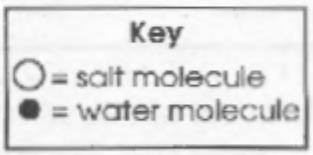
DIFFUSIONS AND OSMOSIS

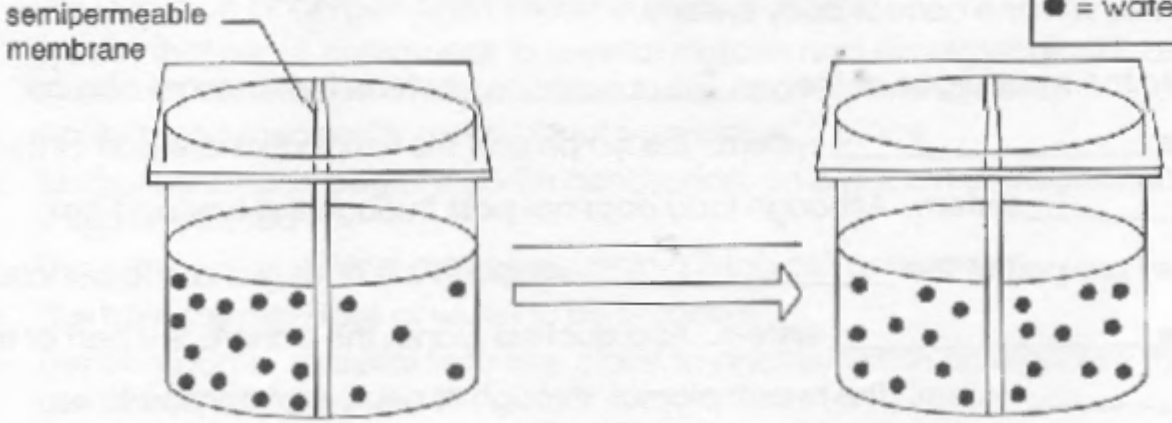
Name _____

The diagrams below show what each solution would look like after a period of time has passed. Label each as osmosis or diffusion.









ELEMENT SYMBOLS

Name _____

Write the symbol for the following elements which are common in living things.

1. oxygen _____
2. hydrogen _____
3. chlorine _____
4. potassium _____
5. fluorine _____
6. manganese _____
7. carbon _____
8. zinc _____
9. sodium _____
10. sulfur _____
11. phosphorus _____
12. iodine _____
13. magnesium _____
14. nitrogen _____
15. copper _____
16. iron _____
17. calcium _____
18. cobalt _____

Write the name of the element indicated by each of the following symbols.

19. As _____
20. Pb _____
21. Kr _____
22. Ba _____
23. He _____
24. Ne _____
25. Si _____
26. U _____
27. Sn _____
28. Pt _____
29. Rn _____
30. Al _____
31. Cu _____
32. Ag _____
33. Pu _____
34. Sr _____
35. Am _____
36. Au _____
37. Ra _____
38. Ge _____
39. Br _____
40. Hg _____

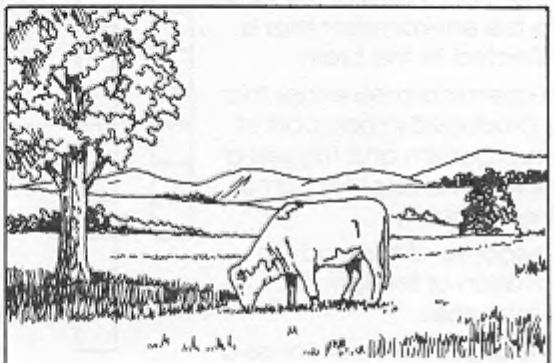
AUTOTROPHS VS. HETEROTROPHS

Name _____

An autotroph is an organism that is capable of forming organic compounds from inorganic compounds in its environment. In other words, an autotroph can make its own food. Heterotrophs must get their food from other organisms.

Classify the following organisms as an autotroph (a) or a heterotroph (h).

1. maple tree _____
2. human _____
3. wheat _____
4. fungi _____
5. ameba _____
6. green algae _____
7. housefly _____
8. fern _____
9. dandelion _____
10. goldfish _____



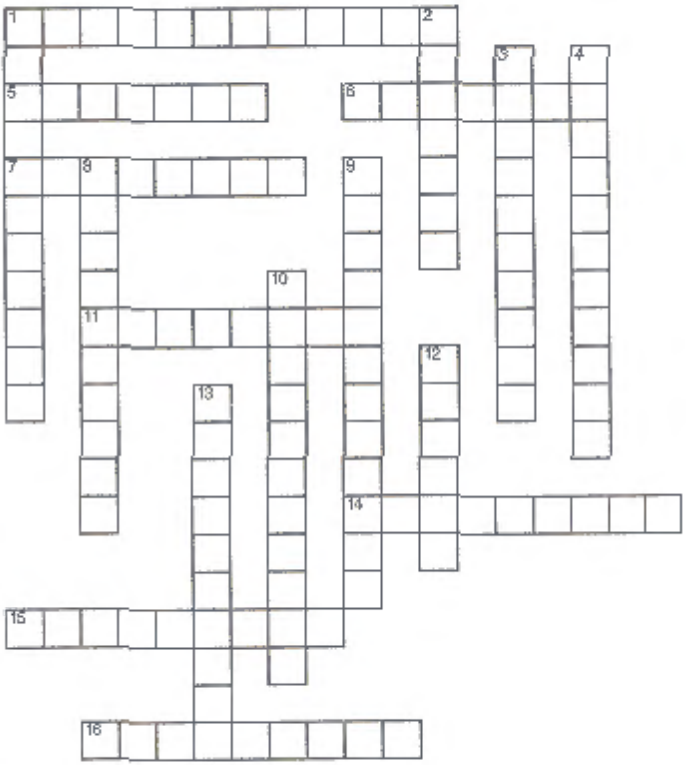
11. grass _____
12. cow _____

Most autotrophic nutrition is a result of photosynthesis. Heterotrophic nutrition involves the taking in and processing of food and the elimination of wastes. Classify the following as related primarily to autotrophic nutrition (a) or heterotrophic nutrition (h).

13. chlorophyll _____
14. digestion _____
15. phagocytosis _____
16. photolysis _____
17. rhizoids _____
18. lipase _____
19. carbon fixation _____
20. pseudopods _____
21. PGAL _____
22. light reaction _____
23. maltose _____
24. CO_2 is used _____
25. ingestion _____
26. chloroplasts _____
27. dark reaction _____
28. grana _____
29. proteose _____
30. glucose production _____
31. stroma _____
32. bile _____

LIFE ACTIVITIES CROSSWORD

Name _____



Across

1. *process of producing more* organisms in order to continue the species
5. information acquired by chemical stimuli or response to the environment that is directed to the brain
6. a chemical messenger that is produced in one part of an organism and triggers a reaction in another part of the organism
7. Response of the body to invasion of foreign substances
11. The organism's actions as a result of sensory, neural, and hormonal factors in response to changes in external or internal conditions
14. The ingestion of food for energy and to provide vitamins and minerals the body cannot make for itself
15. The breakdown of foods into molecules the body can use
16. *Distribution of materials within an organism*

Down

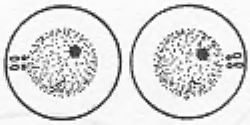
1. The utilization of oxygen and release of carbon dioxide
2. System that relays commands to skeletal muscles and stimulates glands and other muscle so the organism may continue to live and respond to stimuli
3. Ability to independently move about from place to place
4. Series of changes, beginning with conception, an organism undergoes until the adult stage is reached
8. The sum of all chemical processes within a living cell or organism
9. The homeostatic state of water in an organism
10. *The transport of material from one place to another within an organism through the* use of internal fluid
12. An organism's increase in size or number of cells, with no developmental changes
13. Control and coordination of all the activities of an organism

STAGES OF MITOSIS

Name _____

Number the following six diagrams of the stages of mitosis in animal cells in the proper order. Label each stage with the proper name.

_____



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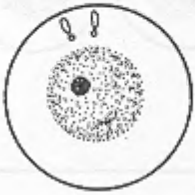

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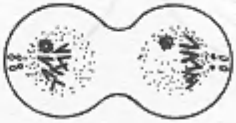
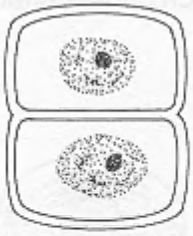


_____

Do the same for the following diagrams of mitosis in plant cells.



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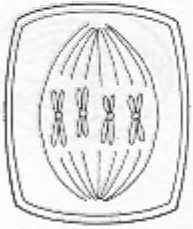

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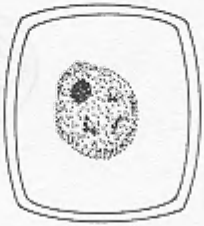

_____

_____

CELLULAR RESPIRATION

Name _____

Fill in the blanks in the following sequences:

Glycolysis

glucose + _____ ATP $\xrightarrow{\text{enzymes}}$ 2 _____ + _____ ATP

Anaerobic Respiration

2 pyruvic acid $\longrightarrow$ 2 _____

or

2 pyruvic acid $\longrightarrow$ 2 _____ + 2 _____

Aerobic Respiration

2 pyruvic acid + oxygen $\xrightarrow{\text{enzymes}}$ _____ + _____ + _____ ATP

Fill in the blanks with the correct term in the questions below.

1. Glycolysis produces a net gain of _____ ATP molecules per molecule of glucose by an anaerobic reaction.
2. Aerobic respiration produces a net gain of _____ ATP molecules per molecule of glucose.
3. _____ respiration is a more efficient producer of energy than anaerobic respiration.
4. The energy contained in a molecule of glucose is changed to a more usable form by combining a _____ atom with _____ to form ATP.
5. When ATP is broken down to _____ and _____, energy is _____.
6. During glycolysis, glucose is first split into two molecules of _____. This requires the energy released from two molecules of ATP being converted to two molecules of _____.
7. The _____ is then converted to _____, producing four _____ molecules and two _____ molecules, which are part of the electron transport chain.
8. The _____ transport chain, which supplies the energy needed for the formation of ATP, requires the formation of _____ from NAD^+, and _____ from FAD.
9. The hydrogen necessary in this chain comes from the breaking apart of _____ molecules.
10. The oxygen released is used to form _____.