Two Kinds of Changes

Physical Change

A **physical change** occurs when the appearance of a substance changes, but chemically the substance is the same. The individual molecules do not change, and no new matter is formed. During some physical changes, matter simply changes from one state to another. Evaporating, melting, freezing, and sublimating are examples of physical changes in which matter changes from one state to another. During **evaporation**, a substance changes from a liquid to a gas. When a substance **melts**, it changes from solid to liquid. A substance that **freezes** changes from a liquid to a solid. During **sublimation**, a substance changes from a solid directly to a gas.

There are other types of physical changes. During some physical changes, an object's size or shape is altered. A physical change also occurs when substances are mixed and something dissolves.

Chemical Change

Chemical change occurs when a chemical reaction takes place. The substances produced during a chemical reaction are different from the original substances. Energy is involved in all chemical reactions. Here are some signs that a chemical reaction has taken place:

- A solid precipitate forms at the bottom of a test tube.
- Heat or light is produced.
- A gas is produced.
- A color change occurs.

Examine the list of changes below. Write *C* before each chemical change. Write *P* before each physical change.

1. ____ erosion of a riverbed by water
2. ____ leaves changing color
3. ____ carving a statue out of marble
4. ____ sanding a piece of wood
5. ____ ice cream melting
6. ____ fireworks exploding
7. ____ baking a cake
8. ____ chocolate melting
9. ____ a flashbulb flashes
10. ____ vinegar is mixed with baking soda
11. ____ cooking waffles
12. ____ lighting a match
13. ____ mothballs disappear over time
14. ____ plants undergo photosynthesis
15. ____ a red mark appears after a bee sting
16. ____ a drop of hydrochloric acid on marble produces carbon dioxide gas

TWO WAYS TO CHANGE

melting ice sculpture . . . a spectacular bonfire . . . a cake baking in the oven . . . a milkshake in ne making . . . an explosion . . . all of these involve changes in matter. Some are physical changes changes in shape, color, or state) and others are chemical changes (changes involving chemical eactions). Which are which? For each change described below, write **P** for physical change or **C** for hemical change. Be ready to explain your choices.

_____ 1. glass breaking

_____ 2. hammering wood together to build a playhouse

_____ 3. a rusting bicycle

_____ 4. melting butter for popcorn

_____ 5. glassblower creating sculptures out of glass

_____ 6. freezing chocolate-covered bananas

_____ 7. separating sand from gravel

_____ 8. spoiling food

_____ 9. burning toast

_____ 10. making salt water to gargle for a sore throat

_____ 11. mixing lemonade powder into water

_____ 12. cream being whipped

_____ 13. water evaporating from a pond

_____ 14. cutting grass

_____ 15. burning leaves

_____ 16. humidifier putting moisture into the air

_____ 17. corroding metal

_____ 18. bleaching your hair

_____ 19. fireworks exploding

_____ 20. squeezing oranges to get orange juice

_____ 21. frying an egg

_____ 22. pouring milk on your oatmeal

Name _____

Name _____

Date _____

Science Homework

For each of the following statements, decide whether a chemical or physical change has taken place. Underline the key word or words that helped you to make your decision.

1. A newspaper yellowed after a few weeks. _____
2. Acid causes a limestone rock to fizz. _____
3. Red meat turned brown after it cooked. _____
4. Folding a piece of paper. _____
5. Cooking an egg in a hot pan. _____
6. Putting acid into your sink to dissolve hairballs. _____
7. Chopping a piece of wood in half with an ax. _____
8. Biting into an apple. _____
9. Exercising and using sugars and fats stored in your body. _____
10. Flattening a lump of clay with your fist. _____
11. Lighting the wood you chopped in half on fire. _____
12. Digesting your dinner. _____
13. Tearing a piece of cloth. _____
14. Taking an antacid tablet. _____

HOMOGENEOUS VS. HETEROGENEOUS MATTER

Name _____

Classify the following substances and mixtures as either homogeneous or heterogeneous. Place a √ in the correct column.

	HOMOGENEOUS	HETEROGENEOUS
1. flat soda pop		
2. cherry vanilla ice cream		
3. salad dressing		
4. sugar		
5. soil		
6. aluminum foil		
7. black coffee		
8. sugar water		
9. city air		
10. paint		
11. alcohol		
12. iron		
13. beach sand		
14. pure air		
15. spaghetti sauce		