

Changes in Matter
Science Ch. C1, Lesson 3, P. c22-27

I. Changes in Matter

A. All changes in state are physical changes.

1. How are ice, liquid water, and water vapor alike? _____
2. What are changes called when no new substance is formed? _____

B. Changes in state, volume, density, form, and size are physical changes.

1. What kind of change is it when you shape clay on a potter's wheel? _____
2. What kind of change is it when you cut paper? _____
3. What kind of change is it when gases are cooled and squeezed into liquids? _____

C. Changes in which one or more new substances are formed are called chemical changes.

1. What forms when electric current is sent through water? _____
2. What make up the space shuttle's main engines? _____
3. What is produced when hydrogen and oxygen are burned as fuels? _____

D. Burning is one kind of chemical reaction.

1. What happens when charcoal burns? _____
2. What are the reactants when charcoal burns? _____
3. What is a product when charcoal burns? _____

E. Some substances are more likely than others to react.

1. Name a gas that reacts with many different substances. _____
2. Name a gas that does not react with many different substances. _____
3. What is the ability of a substance to react chemically called? _____

F. There are clues that can help you identify chemical reactions.

1. What are some clues that show that a chemical reaction occurs? _____

2. What happens when baking soda is mixed with vinegar? _____

3. What do the bubbles show? _____

4. What happens when a candle burns? _____

G. Sometimes it is hard to tell the difference between a physical change and a chemical reaction.

1. Is it a physical change or a chemical reaction when drink powder is mixed with water? _____

2. What happens when the powder is mixed with water? _____

3. What happens when you open a can of soda? _____

4. When bubbles come out of soda, is that a physical or chemical change? _____

5. What happens when you rub your hands together quickly? _____

6. When you rub your hands, what causes the heat? _____

II. Using Physical and Chemical Properties

A. Observing chemical and physical properties can help you decide whether a chemical or physical change has taken place.

1. Why can observing changes help you decide whether a change is physical or chemical?

B. When iron rusts, it turns red or brown.

C. When iron rusts, a chemical reaction has taken place.

1. Name a way that rust and iron are different. _____

2. Name another way that rust and iron are different. _____

3. Name another way that rust and iron are different. _____

4. Name another way that rust and iron are different. _____

5. Name another way that rust and iron are different. _____

Number/Name: _____

Date: _____

6. Name another way that rust and iron are different. _____

D. Chemical properties alone can sometimes be used to identify substances.

1. What is the ability to burn called? _____

2. How can you use combustibility to identify some substances? _____

3. What color is the flame when you burn barium? _____ sodium? _____
potassium? _____

E. Chemical properties are also important in deciding how certain substances can be used.

1. What are many solutions? _____

2. How can you describe acids? _____

3. What can weak acids be used for? _____

4. What can weak bases be used for? _____

5. How can you describe strong acids and bases? _____

6. What is important to measure with acids and bases? _____

7. How can you measure the strength of acids and bases? _____

8. How do indicators work? _____

F. Physical and chemical properties can also be used to separate mixtures or to identify substances in mixtures.

1. What happens to the substances that make up mixtures? _____

G. One industry that uses physical and chemical properties to separate mixtures is the mining industry.

1. What do you have to do before metals can be made into useful products? _____

2. What is an ore? _____

3. What is one way that you can separate impurities from ore? _____

4. What is another way that you can separate impurities from ore? _____

H. A magnet can be used to separate magnetic substances.

1. Give an example of using a magnet to separate substances. _____

2. Why would you want to separate metals? _____

I. Some liquid mixtures can be separated by spinning at very high speeds.

1. How does spinning the liquid separate materials? _____

2. Give an example of separating liquids by spinning them. _____

3. Give another example of separating liquids by spinning them. _____

J. A solution of a solid and a liquid can be separated by boiling away the liquid.

1. What happens when salt water is boiled? _____

2. What is it called when you collect water vapor and condense it? _____

3. What petroleum products are separated using distillation? _____

K. Sometimes both a physical change and a chemical reaction are used to recover a substance from a mixture.

1. How would you recover some copper from a mixture of copper, sugar, and charcoal?
