TABLE OF CONTENTS

UNIT 1 – MATTER

© Illegal to Copy

UNIT 2 – KINDS OF SUBSTANCES

© Illegal to Copy

CHAPTER 12 CONVERSION

UNIT 3 – INTERACTIONS OF MATTER

CHAPTER 13 SORTING MATTER

CHAPTER 14 SOLUTIONS

CHAPTER 15 SUSPENSIONS

CHAPTER 16 CHEMICAL FORMULAS

© Illegal to Copy

CHAPTER 17 CHEMICAL REACTIONS

CHAPTER 18 MEASUREMENT MATH

UNIT 4 – MOTION AND FORCE

CHAPTER 19 SPEED

CHAPTER 20 ACCELERATION

CHAPTER 21 TECTONIC MOVEMENT

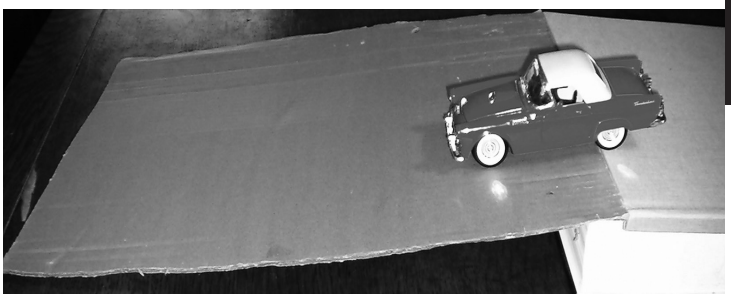
© Illegal to Copy

© Illegal to Copy

© Illegal to Copy

© Illegal to Copy

THE SCIENTIFIC METHOD



Science is ever changing and does not explain everything. The scientific method is one way we study our world. When we try to find answers to questions, such as "Will a toy car go farther on a board if it's lightweight or heavy?" we are using the scientific method.

THE SCIENTIFIC METHOD

1. State your problem or question.
2. Look up information about the topic.
3. Write down what you think will happen before you try the experiment. That is your hypothesis.
4. Set up an experiment. Plan how you will test your hypothesis.
5. Perform the experiment. Record what you observe and/or measure (whether it is what you expected or not).
6. State the results of the experiment.
7. Explain what you learned.

The Game: Use the Scientific Method. Follow the steps.

1. The question: Will a toy car go farther on an inclined plane if it's lightweight or heavy?
2. Look up information about the topic. Write something you learned.

   _____

   _____

   _____
3. What do you think will happen? Will the car go farther if it's lightweight or heavy? _____
4. Set up an experiment. Get a toy car, coins, tape, cardboard, and a book.
5. Perform the experiment. Build a simple inclined plane using cardboard and a book. Set the car at the top of the inclined plane and release it. Measure the distance it traveled. Then, tape the coins to the car and release it. Measure the distance it traveled. Record what you observed and/or measured. _____
6. What happened? Did the car travel a longer distance or a shorter distance with the weight attached? _____
7. What did you learn? _____

   _____

© Illegal to Copy

IONS AND ISOTOPES

Ions are charged particles that have more or fewer electrons than protons. Isotopes are atoms of the same element but with a different number of neutrons.

Break It Down

Ions are atoms with either extra electrons or missing electrons. A normal atom, called a neutral atom, has the same number of electrons as its atomic number. An atom is still the same element if it is missing an electron.

Ions are necessary to life. Your body needs sodium, potassium, calcium, and other ions.

An atom that is missing a neutron or has an extra neutron is called an isotope. It has the same atomic number but a different atomic mass. It is still the same element. Isotopes are just a little different from every other atom of the same element. Several isotopes of each element can be found in nature. Isotopes are used for diagnosing medical problems, cancer therapy, smoke detectors, the oil well industry, logging, and testing the strength of the structures of dams, planes, and bridges.

The Game: List the description words under the correct heading.

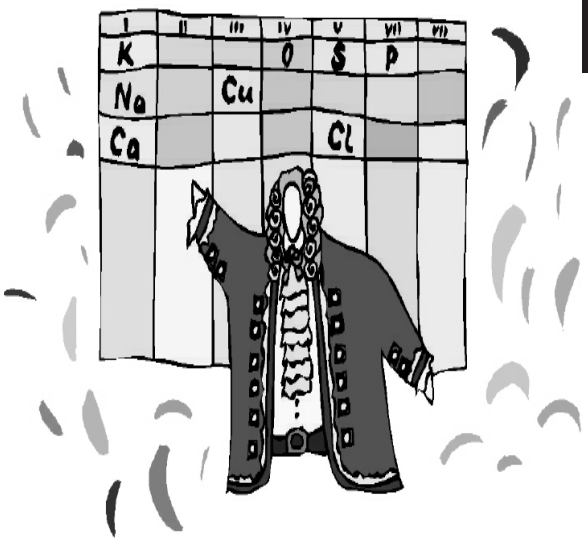
extra electrons
sodium
same atomic numbers
necessary to the body
fewer electrons than protons
extra neutrons
different mass numbers
used to treat cancer

IONS	ISOTOPES
_____	_____
_____	_____
_____	_____
_____	_____

© Illegal to Copy

THE PERIODIC TABLE OF ELEMENTS

The periodic table of elements is a chart of all known elements. A Russian chemist named Dmitri Mendeleev put the chart together in 1869. He noticed that elements with similar properties occurred over and over again (periodically). He put them in order according to atomic weight (mass) and then grouped them into rows and columns based on their chemical and physical properties. The table has changed as more elements have been discovered.



Each box tells about a different element. This box tells about carbon.

Atomic Number	⇦⇨	6
Symbol	⇦⇨	**C**
Atomic Weight	⇦⇨	12.011

Each box has the atomic number, the symbol for the element, and the atomic weight (mass).
Remember: The number of protons identifies the element. The number of protons is also the element's atomic number.

The Game: Look at the box above. Answer the questions.

1. What is the atomic weight of carbon? _____
2. What is the symbol for carbon? _____
3. What is the atomic number for carbon? _____
4. How many protons are in the nucleus of each carbon atom? _____

Who was Dmitri Mendeleev?

_____

© Illegal to Copy

EMULSIONS

An emulsion is a mixture of two liquids in which neither liquid dissolves the other.

Break It Down
An emulsion is a mixture of two substances that do not blend. There are two liquids, and the particles of one liquid are evenly scattered in the other one. One liquid does not dissolve the other one.

Examples:

- some foods such as mayonnaise
- medicines
- lotions

Sometimes emulsifying agents are added to a mixture so that the liquids do not separate. Eggs are added to oil and lemon juice to make the creamy mixture of mayonnaise. Beeswax is used in lotions to keep the oils and water from separating.

A permanent emulsion is homogenized milk. Do you drink 2% milk? _____
People can determine the percentage of fat in milk as part of the homogenization process. Fresh milk is put in a machine that forces the milk through tiny openings. The milk is under a lot of pressure. This breaks up the fat and scatters it evenly throughout the milk. Homogenized milk tastes richer and creamier than nonhomogenized milk.

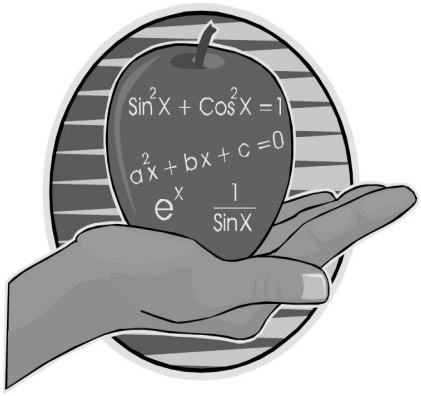
The Game: Match the words with the ideas.

1. _____ emulsifying agent	A. added so lotion does not separate
2. _____ homogenization	B. breaks up fat in milk
3. _____ beeswax	C. two substances that do not blend
4. _____ emulsion	D. eggs

© Illegal to Copy

CHEMICAL EQUATIONS

Chemical equations describe chemical reactions. Equations are shortcuts! You don't have to write all the words out.



reactant reactant product

$$2\,Ag + S \rightarrow Ag_2S$$

A reactant is a substance that is changed in a chemical reaction. A product is the substance that is formed.
FYI: The big arrow points to the substance that is being formed.

silver sulfur silver sulfide (tarnish)

$$2\,Ag + S \rightarrow Ag_2S$$

The Game: Fill in the blanks with the words listed below. Look at the arrows. The big arrow points to the two substances that are being formed.

_____ _____ _____

$$2\,H_2O_2 \rightarrow 2\,H_2O + O_2$$

hydrogen peroxide water _____

$$2\,H_2O_2 \rightarrow 2\,H_2O + O_2$$

reactant oxygen reactant product

© Illegal to Copy