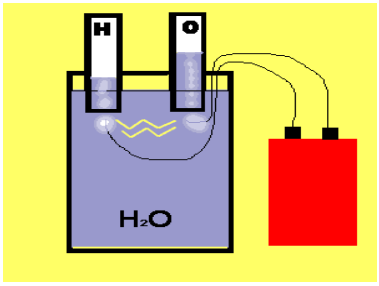
Week of (3-17 to 3-20-08)

Physical, Chemical or Nuclear?

Monday (03-09-09)



Physical, Chemical, or Nuclear?

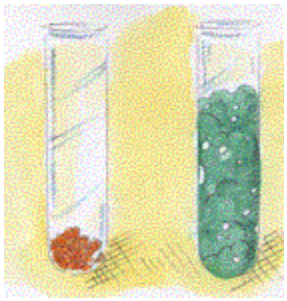
You know that matter is anything that has mass and occupies space. You may not know that matter contains energy that can be converted from one form to another (for example, from solar energy to electric energy) and that matter gains or releases energy as it changes form. These transformations occur in physical, chemical, and nuclear changes.

A physical change is an alteration in the form of matter but not in its *composition*. A change of state, such as from a solid to a liquid or a gas, is a physical change. For example, water forms ice in its solid state and steam in its gaseous state, but the composition of the particles in each state remains the same—water molecules. During a physical change, matter *sometimes gains or releases energy*, usually as heat.

In a chemical change, one type of matter is converted into another. For example, when iron comes into contact with oxygen and water in air, the iron changes into rust. The atoms of the iron and oxygen of the water molecules rearrange themselves and

produce a new matter—rust. The composition of rust is chemically different from the original substances. During a chemical change, matter *always gains or release energy*.

In a nuclear change, the nucleus of an element's atom is altered, thus producing a different element. In one type of nuclear change, fission, a single large nucleus splits into smaller nuclei. For example, the nucleus of a uranium atom may divide into two nuclei—a nucleus of the element barium and a nucleus of the element krypton. During a nuclear change, matter always releases energy—and it releases a considerable amount. A quantity of uranium about the size of a golf ball produces as much energy as one million kilograms of coal. Scientists utilize these qualities of matter to improve existing energy and to search for new energy sources to provide power for commonly used items.



Question 1

Mark *the main idea* M
Mark the statement that is *too broad* B
Mark the statement that is *too narrow* N

a) During a nuclear change, matter always releases energy. ☐
b) Changes to matter occur during many processes. ☐
c) Matter is transformed during physical, chemical, and nuclear changes. ☐

Question 2

Another good title for this passage would be

a) Matter: Create Energy by Changing It.
b) Steam: It's Such a Gas.
c) Changes of State: It's Physical.
d) Fission: We're just Splitting Atoms.

Question 3

In a chemical change, the original matter is altered so that the new substance that is formed is

a) of the same composition as the original
b) only a change of state
c) chemically different from the original
d) split into two or more nuclei

Question 4

We can conclude from this passage that scientists searching for improved energy sources are most likely to explore

a) composition changes
b) nuclear changes
c) physical changes
d) chemical changes

Question 5

To help the reader compare what happens to energy in the three types of changes, the writer

a) italicizes key phrases
b) underlines key terms
c) states scientific facts
d) quantifies amounts

Question 6

In this passage, *composition* refers to

a) an essay
b) a piece of written music

c) the makeup of a substance
d) an arrangement

Answer key:

1a. N 1b. B 1c. M 2) A 3) C 4) B 5) A 6) C

Note to teachers:
If you are in an intelligent classroom, please show these websites to your students. If not, then give them the URLs for them to do it at home.

COOL WEBSITES:

Phases of Water (Click on the first button next to the flames to start the animation)

http://mutuslab.cs.uwindsor.ca/schurko/animations/waterphases/status_water.htm

Physical Change
http://www.saskschools.ca/curr_content/science9/chemistry/lesson8b.html

Chemical Change
http://www.saskschools.ca/curr_content/science9/chemistry/lesson8a.html

Charcoal on the Rise
http://www.saskschools.ca/curr_content/science9/chemistry/lesson8c.html

Friday (02/26/10)

Silent Reading