Disclaimer: This packet is intended ONLY for the use of students enrolled in Leon County Schools.

Complete the assignments below.

8th Grade

Week 1:
☐ Controls and Variables (SC.8.N.1.1) ☐ Content Area Reading: Everyday Compound or Poison? (SC.8.P.8.4) ☐ Skill Activity: Separating and Controlling Variables (SC.8.N.1.1)

Week 2:
☐ Matter Review (Multiple Standards) ☐ Content Area Reading: The Transfer of Heat ☐ Skill Activity: Interpreting Tables

Week 3:
☐ Content Area Reading: The Amazing World Inside a Human Cell ☐ Content Area Reading: The Hydrologic Cycle ☐ Skill Activity: Interpreting Scientific Illustrations

Week 4:
☐ Models of the Solar System (SC.8.E.5.8) ☐ Content Area Reading: Life Finds a Way and Naturally Selected to Survive ☐ Skill Activity: Interpreting Data

Science Week 1

Scientific Method Name _____
Controls and Variables – Part 1

SpongeBob and his Bikini Bottom pals have been busy doing a little research. Read the description for each experiment and answer the questions.

1 - Patty Power
Mr. Krabbs wants to make Bikini Bottoms a nicer place to live. He has created a new sauce that he thinks will reduce the production of body gas associated with eating crabby patties from the Krusty Krab. He recruits 100 customers with a history of gas problems. He has 50 of them (Group A) eat crabby patties with the new sauce. The other 50 (Group B) eat crabby patties with sauce that looks just like new sauce but is really just mixture of mayonnaise and food coloring. Both groups were told that they were getting the sauce that would reduce gas production. Two hours after eating the crabby patties, 30 customers in group A reported having fewer gas problems and 8 customers in group B reported having fewer gas problems.

Which people are in the control group?

What is the independent variable?

What is the dependent variable?

What should Mr. Krabs' conclusion be?

Why do you think 8 people in group B reported feeling better?

2 – Slimotosis
Sponge Bob notices that his pal Gary is suffering from slimotosis, which occurs when the shell develops a nasty slime and gives off a horrible odor. His friend Patrick tells him that rubbing seaweed on the shell is the perfect cure, while Sandy says that drinking Dr. Kelp will be a better cure. Sponge Bob decides to test this cure by rubbing Gary with seaweed for 1 week and having him drink Dr. Kelp. After a week of treatment, the slime is gone and Gary's shell smells better.

What was the initial observation?

What is the independent variable?

What is the dependent variable?

What should Sponge Bob's conclusion be?

3 – Marshmallow Muscles

Larry was told that a certain muscle cream was the newest best thing on the market and claims to double a person's muscle power when used as part of a muscle-building workout. Interested in this product, he buys the special muscle cream and recruits Patrick and SpongeBob to help him with an experiment. Larry develops a special marshmallow weight-lifting program for Patrick and SpongeBob. He meets with them once every day for a period of 2 weeks and keeps track of their results. Before each session Patrick's arms and back are lathered in the muscle cream, while Sponge Bob's arms and back are lathered with the regular lotion.

Time	Patrick	SpongeBob
Initial Amount	18	5
After 1 week	24	9
After 2 weeks	33	17

Which person is in the control group?

What is the independent variable?

What is the dependent variable?

What should Larry's conclusion be?

4 – Microwave Miracle

Patrick believes that fish that eat food exposed to microwaves will become smarter and would be able to swim through a maze faster. He decides to perform an experiment by placing fish food in a microwave for 20 seconds. He has the fish swim through a maze and records the time it takes for each one to make it to the end. He feeds the special food to 10 fish and gives regular food to 10 others. After 1 week, he has the fish swim through the maze again and records the times for each.

Special Food Group
(Time in minutes/seconds)

Fish	Before	After
1	1:06	1:00
2	1:54	1:20
3	2:04	1:57
4	2:15	2:20
5	1:27	1:20
6	1:45	1:40
7	1:00	1:15
8	1:28	1:26
9	1:09	1:00
10	2:00	1:43

Regular Food Group
(Time in minutes/seconds)

Fish	Before	After
1	1:09	1:08
2	1:45	1:30
3	2:00	2:05
4	1:30	1:23
5	1:28	1:24
6	2:09	2:00
7	1:25	1:19
8	1:00	1:15
9	2:04	1:57
10	1:34	1:30

What was Patrick's hypothesis?

Which fish are in the control group?

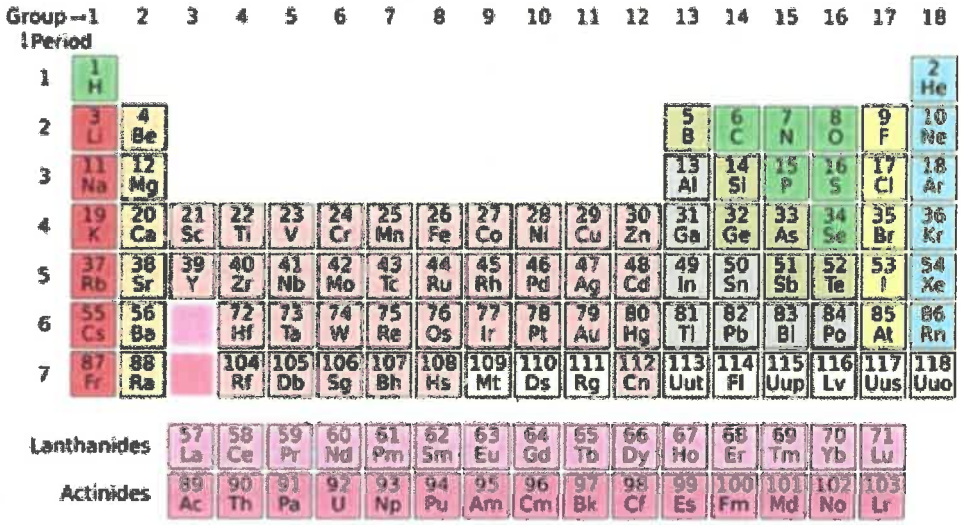
What is the independent variable?

What is the dependent variable?

Look at the results in the charts. What should Patrick's conclusion be?

Everyday Compound or Poison?

by ReadWorks



periodic table

All elements found on the periodic table have certain distinct properties. Elements are single types of atoms, while atoms are the fundamental building blocks of all matter. Gold, for instance, is a soft, naturally occurring metal known for being beautiful and desired. Gold is malleable, and while it is found naturally in the environment, it is often reworked and incorporated into fine jewelry. Oxygen is a necessary and naturally occurring element. It's an invisible, odorless gas that's a crucial part of the air we breathe and necessary for our bodies to function properly. Often, elements like those noted are combined in varying ways to create new chemical substances.

Chemical substances react in certain ways and also have certain discernible properties. For instance, when an oxygen atom and two hydrogen atoms come together they form water, which is essential to life. When the atoms of a specific substance are regrouped, a new substance is formed with often vastly different properties from the original substance. Occasionally something completely harmless, or even necessary, can become dangerous or lethal when its molecules (a grouping of two or more atoms) are regrouped.

The components of table salt are a good example of how different substances can look when their atoms are rearranged. Common table salt, also known as sodium chloride, is an interesting chemical compound because, while it is commonly consumed by humans, when you separate its elements- sodium and chlorine- you are left with something quite different from the edible seasoning known as salt.

The components of salt are sodium and chlorine, both of which are harmful for human consumption and even contact. Sodium requires great care when being handled. If it comes into contact with water, the reaction can be flammable, while powdered sodium has the potential to be combustible (explosive) in oxygen or air.

Chlorine, meanwhile, is an extremely caustic and dangerous substance. Chlorine is used primarily as

a cleaning agent; it is commonly used in swimming pools to render them sanitary, but is mixed with other chemicals and diluted for these purposes. This is what makes it safe for people to swim in swimming pools.

Chlorine has also had other, more dangerous uses in the past. Chlorine is a toxic gas that is extremely harmful to the respiratory system and may also react with certain flammable materials. When chlorine reacts with the mucous of the lungs, it can create a potentially lethal compound known as hydrochloric acid. During World War I, chlorine gas was used by Germany as a chemical weapon. It only takes a few deep breaths of the gas, at a certain potency, to cause death.

Hydrochloric acid, a clear solution of hydrogen and chlorine in water, has other uses, however, including household cleaning and food processing. It's also found naturally in the body's gastric acid. Hydrochloric acid is found in food-grade purification levels in products such as aspartame, fructose and citric acid, as well as in gelatin production.

Another, perhaps more familiar, example of atoms being regrouped to form a different compound is carbon monoxide and carbon dioxide. These gases are mentioned often and frequently mistaken for one another, but each serves very different purposes. The scientific difference between the two compounds is the number of oxygen atoms bonded with the carbon atom. But the general difference- the one we notice as humans- is quite significant.

Both carbon monoxide and carbon dioxide are colorless, odorless gases. Carbon monoxide occurs naturally in animal metabolism, plant photosynthesis, volcano eruption, forest fires and other combustion. It also comes from manmade processes like operating a stove. When carbon monoxide accumulates in a contained area, it can become lethal to humans. People who directly inhale enough carbon monoxide will lose consciousness and eventually die.

Carbon dioxide, on the other hand, occurs naturally in the atmosphere. One way carbon dioxide is produced is through the breathing processes of humans and animals. Carbon dioxide is also emitted in the burning of fossil fuels. Additionally, carbon dioxide can be found in lakes and at the bottom of the ocean.

While carbon dioxide occurs naturally and is not known to be as harmful as carbon monoxide, it can still be dangerous to humans when inhaled in certain quantities.

Slight chemical changes can radically modify the characteristics of a compound, and we don't have to look to radically different elements to find enormous differences. Sometimes only a small difference in chemical composition results in a very important alteration.

Name: _____ **Date:** _____

1. . What happens when the atoms of a substance are regrouped?

A. gold becomes malleable

B. the atoms break apart and disappear

C. a new substance is formed

D. the substance stays the same

2. The creation of carbon monoxide is an effect. What is one cause?

A. the regrouping of the atoms in table salt

B. the burning of fossil fuels

C. cleaning swimming pools

D. operating a stove

3. Table salt can be separated into sodium and chlorine. Sodium is explosive. Chlorine is a gas that can kill people.

What can be concluded from the statements above?

A. A harmful compound can become harmless when its elements are separated.

B. A harmless compound can become harmful when its elements are separated.

C. Breaking a compound into its separate elements has no noticeable effects.

D. Breaking a compound into its separate elements can create carbon dioxide.

4. Based on the information in the passage, what is true of gases?

A. Some, but not all, gases are harmful to humans.

B. Any gas with carbon in it is not harmful to humans.

C. All gases are harmful to humans.

D. No gases are harmful to humans.

5. What is this passage mainly about?

A. Germany's use of chlorine in World War I as a chemical weapon

B. hydrochloric acid, aspartame, fructose, citric acid, and gelatin production

C. the similarities and differences between carbon dioxide and carbon monoxide

D. changes in chemical compounds and the effects of those changes

6. Read the following sentences: "When the atoms of a specific substance are regrouped, a new substance is formed with often vastly different **properties** from the original substance. Occasionally something completely harmless, or even necessary, can become dangerous or lethal when its molecules (a grouping of two or more atoms) are regrouped."

What does the word **properties** mean above?

A. extremely large amounts

B. places where experiments are done

C. qualities or characteristics

D. elements or compounds

7. Choose the answer that best completes the sentence below.

Oxygen by itself is not harmful; _____, it can become harmful when combined with carbon.

A. however

B. for instance

C. in summary

D. namely

8. What is hydrochloric acid?

9. What is hydrochloric acid used for?

10. Should people make changes to chemical compounds? Support your answer with evidence from the passage.

Skill Activity

Separating and Controlling Variables

Background

Scientists often will conduct experiments to answer questions, test hypotheses, or solve problems. In any experiment, it is important to keep all factors the same except for the one you are testing. The factor you change is called the independent variable. If you change more than one variable in an experiment, you will not know which factor caused the effects you observe in the experiment.

Identify the independent variable in the following experiment.

Suppose a scientist has the job of studying the factors that affect the growth rate of marigolds. She sets up four plants to test her experiment. Descriptions of the plants are listed below.

Procedure

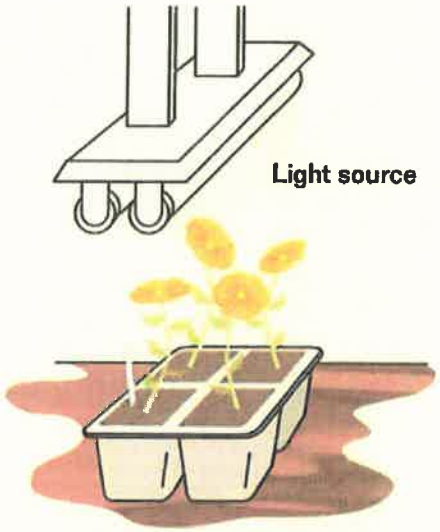
Study the experiment descriptions and identify the independent variable. You may wish to make a table to organize the information.

Plant 1—soil mix A, 12 hours of light per day, no fertilizer, 22°C, water every other day.

Plant 2—soil mix A, 12 hours of light per day, no fertilizer, 22°C, water once a week.

Plant 3—soil mix A, 12 hours of light per day, no fertilizer, 22°C, water every day.

Plant 4—soil mix A, 12 hours of light per day, no fertilizer, 22°C, no water.



Practicing the SKILL

1. What variable is being tested in this experiment?
2. Name three other variables in this experiment.
3. Plant 2 grew taller than Plant 3. Infer what caused this effect.
4. Write a hypothesis that would be appropriate for this experimental design.
5. How might the experiment change if the scientist wanted to study the effect of sunlight on the growth rate of marigolds? Write a hypothesis for this experiment.