

Science Nine

Module Two:

Matter and Chemical Change

Name:

Date Received:

Date In:

Grade:

Science 11

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Matter and Chemical Change




Unit B





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 - Classifying Matter
 - Mixtures of Matter
- Topic 2 Changes In Matter**
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Topic 1 Exploring Matter

Identify or Illustrate the following W.H.M.I.S. symbols

| | | |
|---|---|---|
|  | |  |
| | Toxic | |
| |  | |
| Compressed Gas | | Reactive |

Identify the Lab Safety equipment by telling what it is, or drawing what it looks like.

| | | | |
|------------------|--|--------------------------|--|
| |  | |  |
| Fume Hood | | Fire Extinguisher | |

Illustrate and explain the following techniques or procedures to be followed in the Science lab.

| | |
|-------------------------------------|---|
| Wafting an unknown substance | Heating Chemicals in a Test Tube |
| | |
| | |
| | |
| | |

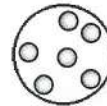
Classifying Matter

Identify the 5 main points in the Particle Model of Matter.

What do the first two points help us to understand?

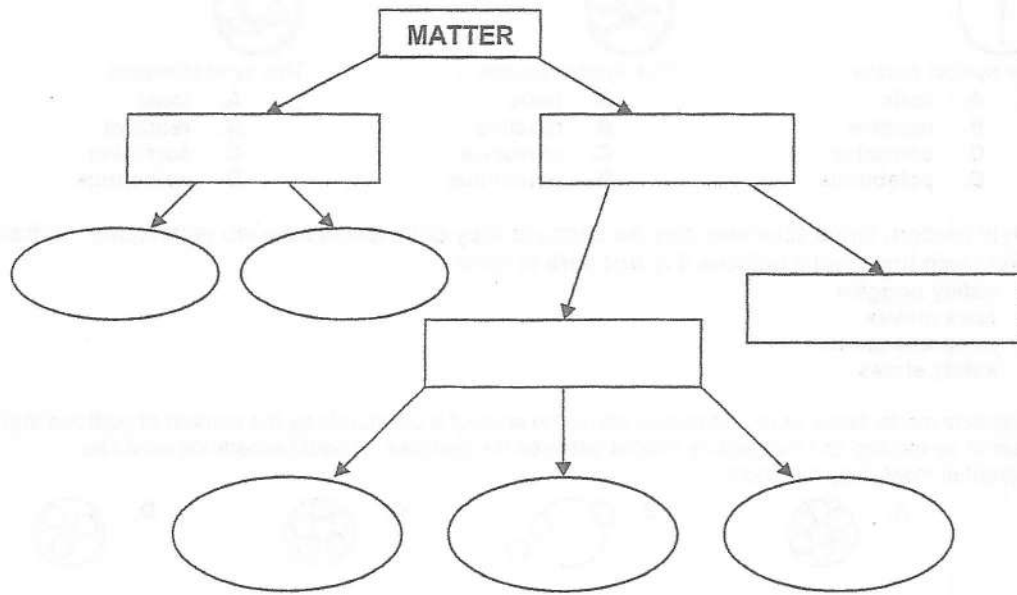
What do the remaining points help to explain?

Identify each state of matter and describe the action of the particles in that state.



| | | |
|-------|-------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Mixtures of Matter
How is matter Classified?



Explain the difference between a colloid and an emulsion.

Topic 1 – Exploring Matter

1.



This symbol means ...

- A. toxic
- B. reactive
- C. corrosive
- D. poisonous

2.



This symbol means ...

- A. toxic
- B. reactive
- C. corrosive
- D. poisonous

3.



This symbol means ...

- A. toxic
- B. reactive
- C. corrosive
- D. poisonous

4. Even in modern times scientists can die because they don't follow safe lab techniques. When working with toxic metal poisons it is **not safe** to wear ...

- A. safety goggles
- B. latex gloves
- C. neoprene apron
- D. safety shoes

5. The particle model helps us to understand about the state of a substance by the number of particles that appear to be moving and the relative spaces between the particles. A liquid substance would be represented most likely by model ...

A.



B.



C.

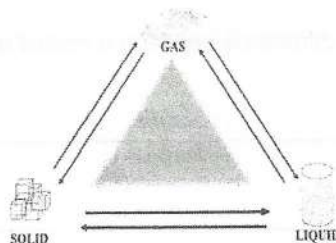


D.



6. When a substance undergoes a change of state it can use energy or give off energy. The change that occurs when a substance changes **from a liquid to a gas** is referred to as ...

- A. deposition
- B. sublimation
- C. vaporization
- D. condensation



7. The Particle Model of Matter is useful in explaining the differences among solids, liquids, and gases. This type of matter always fills whatever container it is in.

- A. gas
- B. solid
- C. liquid
- D. plasma

8. Concrete is a mixture that would best be classified as ...

- A. colloid
- B. solution
- C. suspension
- D. mechanical

9. Brass is a solution that is best classified as ...

- A. element
- B. solution
- C. compound
- D. mechanical

10. A colloid is a heterogeneous mixture that is composed of fine particles evenly distributed throughout another substance. An example of a colloid is ...

- A. milk
- B. mayonnaise
- C. flour in water
- D. hair gel

What happens during a physical change?

What happens during a chemical change?

What are the clues that describe a change as being chemical?

Complete the table by giving a physical property and a chemical property for each example of matter.

| Matter | Physical Property | Chemical Property |
|----------|-------------------|-------------------|
| gold | | |
| copper | | |
| iron | | |
| sulfur | | |
| water | | |
| helium | | |
| hydrogen | | |

Topic 2 - Changes In Matter

- Properties are characteristics that can be used to describe how a substance behaves. Ductility is a property that describes a substance's ...
 - mixing ability
 - reaction with water
 - ability to stretch
 - toxic effect
- Deposition is a change that occurs when a gas changes directly into a solid and heat is released. The evidence that this is a physical change is ...
 - energy is released or absorbed
 - it is a permanent change
 - gas bubbles form in the process
 - no new substance is formed
- It is often difficult to decide if a change is physical or chemical, so certain clues will help you decide if a chemical change has occurred. The only evidence that will guarantee a chemical change has occurred is ...
 - a change in colour and/or odour
 - the release or absorption of energy (heat)
 - that a new material is formed
 - the formation of a solid (precipitate) in a liquid
- The only list below that describes only chemical properties of a substance is ...
 - reactivity, toxicity, stability, malleability
 - ductility, crystal shape, miscibility, solubility
 - malleability, smell, viscosity, miscibility
 - density, conductivity, combustibility, color
- A substance's ability to resist being scratched is the physical property of matter known as ...
 - ductility
 - hardness
 - malleability
 - conductivity
- An obvious chemical property of pancakes is ...
 - ability to combine ingredients easily
 - the positive reversibility of the process
 - the heat it gives off as it cooks
 - the new substance that appears to form
- Physical or chemical change can be identified by evidence. When a substance undergoes a physical change the evidence used includes all of the following, **EXCEPT** ...
 - colour
 - odour
 - toxicity
 - density
- This property of gold allows it to be hammered into thin sheet and different shapes.
 - malleability
 - ductility
 - miscibility
 - stability

Topic 3 What Are Elements?

What were the 4 original elements?

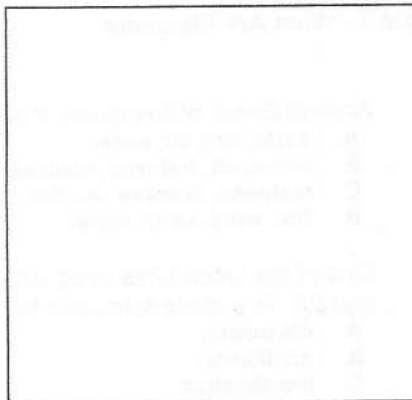
What did Alchemists do?

Explain what the Law of Conservation of Mass describes.

Explain what the Law of Definite Composition describes.

How can you identify an unknown substance?

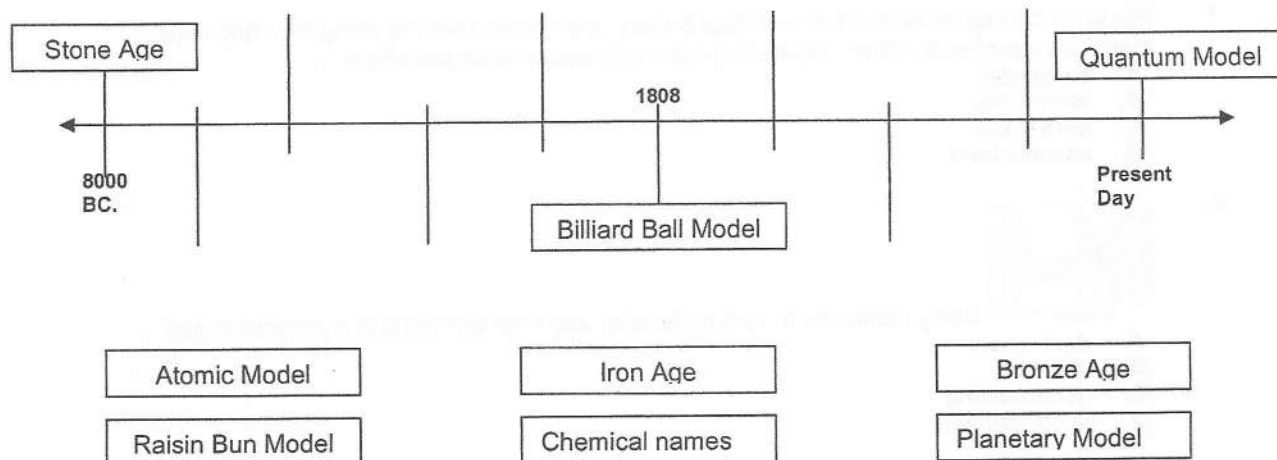
Explain, with an illustration, the process of Hydrolysis.



Explain John Dalton's Atomic Theory as it applies to matter.

Explain the difference between a LAW, a THEORY and a MODEL.

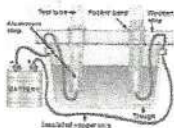
Complete the Timeline



Topic 3 - What Are Elements

- Ancient Greek philosophers thought matter was made out of these four 'elements'...
 - earth, fire, air, water
 - water, air, hotness, coldness
 - wetness, dryness, air, fire
 - fire, wind, earth, water
- One of the procedures used today - credited to alchemists (part pharmacist and part mystic) - is a procedure used to separate mixtures, called ...
 - dissolving
 - distillation
 - desalination
 - disintegration
- Antoine Lavoisier defined elements as pure substances that could not be decomposed into simpler substances by means of a chemical change. In this way he identified 23 pure substances as ...
 - solutions
 - particles
 - elements
 - compounds
- Lavoisier was one of the first chemists to use a balanced view of chemical change, which we now call the Law of ...
 - Conservation of Mass
 - Definite Composition
 - Multiple Proportions
 - Combustion
- First suggested by **Albert Einstein** in his famous equation:

$$E = MC^2 \quad (\text{E is Energy, M is Mass, } C^2 \text{ is a large number})$$
 His equation does not follow the law stated by Lavoisier, because mass is ...
 - created by energy
 - destroyed by energy
 - changed into energy
 - increased by energy
- An unknown substance can be identified by measuring a property of the substance (eg. density) and compare it to known values of other substances. If the test property matches a known value, it is likely that substance, because each substance has its own ...
 - range of densities
 - combined properties
 - color and chemical properties
 - unique distinguishing properties
- Allesandro Volta made the first practical battery (the voltaic pile), by piling zinc and copper plates on top of each other, separating them with paper discs soaked in ...
 - electrodes
 - electrolyte
 - pure water
 - animal blood



- Using electricity to split molecules into their elements is a process called ...
 - electrolysis
 - electricity
 - electroplating
 - electrorefining

9. John Dalton developed a theory that helped explain what happened in the electrolysis of water and was a new way to explain chemical facts and laws.
- All matter is made up of tiny particles called atoms
 - Atoms cannot be created, destroyed, or divided into smaller particles.
 - All atoms of the same element are identical in mass and size. Atoms of one element are different in mass and size from the atoms of other elements.
 - Compounds are created when atoms of different elements link together in definite proportions
- His theory was called the ...
- Quantum Theory**
 - Atomic Theory**
 - Raisin Bun Theory**
 - Plum Pudding Theory**
10. An element is made up of only one type of particle, or atom. Each element has its own unique set of distinguishing properties and cannot be broken down into simpler substances by means of a chemical change. A compound is made up of 2 or more elements chemically combined together. Compounds can be broken down into the elements that they are composed of. The common characteristic of elements and compounds is that they are ...
- pure substances**
 - heterogeneous mixtures**
 - homogeneous mixtures**
 - solid or liquid solutions**
11. In science, these do not explain anything. They simply describe and summarize what happens.
- models**
 - theories**
 - ideas**
 - laws**
12. Smaller particles (subatomic) have been discovered and Dalton's Theory needed to be revised. The model we use today to explain atomic and subatomic particles is the ...
- Raisin bun model**
 - Planetary model**
 - Quantum model**
 - Plum pudding model**

Topic 4 Classifying Elements

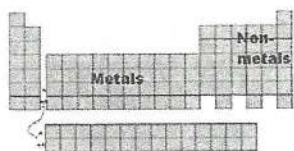
Early chemists used symbols of the sun and the planets to identify the elements known to them. Illustrate the symbols they used.

| | | | | | | | |
|----------------|------|--------|------|---------|---------|--------|--------|
| Metal | gold | silver | iron | mercury | tin | copper | lead |
| Symbol | | | | | | | |
| Celestial Body | Sun | Moon | Mars | Mercury | Jupiter | Venus | Saturn |

Illustrate the symbols John Dalton later used for the different substances listed.

| | | | | | | |
|-----------|----------|----------|-------|---------|---------------|-------------|
| Substance | Hydrogen | Nitrogen | Water | Pot Ash | Sulfuric Acid | Phosphorous |
| Symbol | | | | | | |

What does this illustration tell you about the History of the Periodic Table




Describe how it has changed to what is illustrated here.




















Describe each Chemical Family and explain how it is represented in the Periodic Table.

| Chemical Family | Description | Table Representation |
|-----------------------|---|---|
| Transition Metals | | |
| Other Metals | | |
| Metalloids | | |
| Non-Metals | | |
| Rare Earth Elements | | |
| Alkali Metals | | |
| Alkaline Earth Metals | | |
| Noble Gases | Outer shell is full of electrons, making these gases stable | Group 18 – Dark Green 1 st column on the right side |
| Halogens | | |

Topic 4 - Classifying Elements

1.  Early chemists used the planets to identify the elements known to them. This later was a problem, when more elements were discovered, because they ran out of planets. This symbol represent the planet and element ...
- Mars - iron
 - Venus - copper
 - Mercury - mercury
 - Jupiter - tin

2. Dalton's 1808AD symbols and formulae.

| | | |
|--|---|--|
|  Hydrogen |  Soda |  Ammonia |
|  Nitrogen |  Pot Ash |  Olefiant |
|  Carbon |  Oxygen |  Carbonic Oxide |
|  Sulphur |  Copper |  Carbonic Acid |
|  Phosphorus |  Lead |  Sulphuric Acid |
|  Alumina |  Water | |

- The purpose for developing a new set of chemical symbols was that Dalton wanted to ...
- become rich and famous
 - win a Nobel Prize in Chemistry
 - earn bragging rights with other scientists
 - streamline communication with other scientists
3. Berzelius later revised Dalton's symbols by replacing the pictures with ...
- letters
 - names
 - shapes
 - numbers
4. John Newland's "*law of octaves*" identified the pattern in which the properties of the elements seemed to repeat at regular intervals, they were similar to the ...
- base ten number system
 - suits of playing cards
 - heartbeats of different animals
 - octave scale in music
5. These elements have both metal and non-metal properties. Some of them are semi-conductors, which means, they can carry an electrical charge under special conditions. Making them great for computers and calculators. They are the ...
- Transition Metals
 - Rare Earth Elements
 - Metalloids
 - Other Metals
6. The 6 elements in this group all have the maximum number of electrons possible in their outer s shell which makes them stable. They are known as the ...
- Halogens
 - Alkali Metals
 - Noble Gases
 - Alkaline Earth Metals
7. Demitri Mendeleev wanted to find a pattern that would allow him to predict the properties of elements not yet discovered. By using information cards he charted the pattern that seemed to work. The characteristic that showed that the properties of elements vary periodically was the ...
- atomic number
 - atomic mass
 - symbol
 - density

Topic 5 The Periodic Table



What system did Dmitiri Mendeleev (1834-1907) use to organize the elements?

Why did Dmitiri Mendeleev use '?' in his original representation of the elements?

Explain what each of the following tell us about an element ...

Atomic Number

Mass Number

Atomic Symbol

Atomic Mass

How many elements are known? _____

What are the Horizontal rows called? _____

How are they numbered? _____

Topic 5 - The Periodic Table

- Mendeleev arranged the element cards into a 'solitaire-like' table. He played with them, by sorting and arranging the elements in many different combinations. He was able to identify gaps where elements, would be able to fit, that were ...
 - known to exist
 - not yet discovered
 - rare earth elements
 - identified by alchemists
 - In 1915 the Modern Periodic Table was reorganized, including more information about each element with a focus on ...
 - atomic structure
 - Chemical properties
 - Physical properties
 - reactivity rating
 - These are used worldwide and almost always use one or two letters that represent an element ...
 - Atomic Number
 - Mass Number
 - Atomic Symbol
 - Atomic Mass
 - Vertical columns form a **group** of elements (*numbered 1-18*) The horizontal rows (*numbered 1-7*) are called ...
 - lists
 - types
 - family
 - periods
5.

| | |
|-----------|---|
| 11 | 2 |
| Na | 8 |
| Potassium | 1 |
| 22.98 | |

In this element –
Sodium –
11 refers to the ...

6.

| | |
|--------|---|
| 8 | 2 |
| O | 8 |
| Oxygen | 8 |
| 15.99 | 1 |

In this element – Oxygen –
the numbers down the right
side indicate the ...
- mass
 - number
 - reactivity
 - ion charge
- mass
 - toxicity
 - number
 - ion charge

Topic 6 - Chemical Compounds

Explain the difference between organic and inorganic compounds.

How is a chemical formula determined?

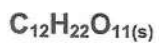
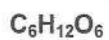
Write the **chemical formula** as determined by the **name** of the compound.

Aluminum oxide

Calcium nitrite

Sodium Chloride

Write the **name** of the compound as determined by the **chemical formula**.



Compare the properties of Molecular and Ionic Compounds

| Properties of molecular compounds | Properties of ionic compounds |
|-----------------------------------|-------------------------------|
| • _____ | • _____ |
| • _____ | • _____ |
| • _____ | • _____ |
| • _____ | • _____ |
| • _____ | • _____ |

What are the rules for naming Molecular Compounds?

How are ions formed?

What are polyatomic atoms?

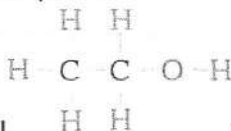
What are the rules for naming Ionic Compounds?

How can you use ion charges and chemical names to write a formula for an ionic compound?

What distinct property do all ionic compounds have?

Topic 6 - Chemical Compounds

- When any of the 112 elements combine into groups of 2 or more they form compounds. If atoms of elements are shared, this type of compound is formed.
 - ionic
 - atomic
 - aqueous
 - molecular
- The chemical formula uses symbols and numerals to identify which elements and how many atoms of each element are present in the compound.



The chemical formula for **ethanol** would be written as ...

- $\text{C}_2\text{H}_6\text{O}$
 - $\text{H}_3\text{CH}_2\text{COH}$
 - $\text{C}_2\text{3H}_2\text{O}$
 - $\text{H}_2\text{HC}_2\text{OH H}_2$
- Guyton de Morveau in France developed a standardized chemical naming system in 1787 to determine a chemical name. The type of element that is always first is the ...
 - acid
 - base
 - metal
 - Non-metal
 - If a compound is formed and it contains a metal the compound is.
 - ionic
 - acidic
 - basic
 - molecular
 - The only compound that contains three elements is ...
 - $\text{H}_2\text{O}_{(l)}$ Water
 - $\text{C}_6\text{H}_{12}\text{O}_{6(s)}$ Glucose
 - $\text{CO}_{2(g)}$ Carbon dioxide
 - $\text{NO}_{2(g)}$ Nitrogen dioxide
 - Substances dissolved in water use a symbol following the chemical formula to identify it as a water-based solution ...
 - liquefied
 - dissolved
 - distilled
 - aqueous
 - A molecule is the smallest independent unit of a pure substance. **Diatomic** molecules are molecules made up of.
 - 2 atoms of the same element
 - more than 2 atoms of an element
 - 1 atom from 2 different elements
 - 2 atoms from 2 different elements
 - In molecular pure substances the bonding between atoms is strong, but the attraction between the molecules is weak. They are good insulators, poor conductors and have a distinct crystal shape. This type of molecular compound is produced when ...
 - metals combine
 - non-metals* combine
 - gases and solids combine
 - non-metals and metals combine

9. Some molecular compounds are better known by their common names rather than their chemical names, example: water H_2O is actually
- hydroxide
 - dihydroxide
 - hydrogen dioxide
 - dihydrogen oxide
10. When dissolved in water, the metal (**Na**) loses an electron and the nonmetal (**Cl₂**) gains an electron forming an aqueous solution of ions like these ...
- $(\text{Na})^+ (\text{Cl}_2)^+$
 - $(\text{Na})^- (\text{Cl}_2)^+$
 - $(\text{Na})^+ (\text{Cl}_2)^-$
 - $(\text{Na})^- (\text{Cl}_2)^-$
11. Some ions can also form when certain atoms of elements combine. These ions are called **polyatomic** ions (*poly* meaning "many"). Polyatomic atoms are a group of atoms acting as one. The compound that contains a polyatomic ion is ...
- $\text{H}_2\text{O}_{(l)}$
 - $\text{NaCl}_{(s)}$
 - $\text{C}_6\text{H}_{12}\text{O}_6_{(s)}$
 - $\text{CaCO}_3_{(s)}$
12. Some compounds of copper such as Copper II Sulfate used use a roman numeral in its chemical name. **Cu(II)SO₄** The roman numeral is used to show ...
- which ion is used
 - how the ion is used
 - the order of ions used
 - how many ions are used
13. A compound made from two elements is called a.
- dual compound
 - binary compound
 - double compound
 - secondary compound
14. Generally when looking at patterns in the periodic table this can be said about elements in a group ...
- They all have the same density
 - They react very violently
 - They all have the same ion charge
 - They all have different ion charges
- 15.

| # of Atoms | Prefix |
|------------|--------|
| 1 | mono |
| 2 | di |
| 3 | tri |
| 4 | tetra |
| 5 | penta |

The formula for carbon tetrachloride is ...

- C_4Cl
- CCl_4
- C_4Cl_4
- Cl_4C

Topic 7 Chemical Reactions

What are the four main types of chemical reactions?

What are the clues to identify a change as being chemical?

Write a word equation and a chemical equation for the corrosion of iron.

How can you identify an unknown gas?

Explain the difference between an Endothermic and Exothermic reaction – give an example of each.

Topic 7 - Chemical Reactions

- Different types of chemical reactions can occur when two or more substances combine to form new substances. Corrosion (iron + oxygen + water \rightarrow rust) is this type of chemical reaction.
 - exchange
 - combination
 - displacement
 - decomposition
- A chemical change, which **releases** energy, is called ...
 - exothermic
 - endothermic
 - combustable
 - dangerously reactive
- Chemical reactions can be written as **word equations** which gives the names of all the reactants followed by an arrow which points to the names of all the products.
eg. (*iron + oxygen + water \rightarrow rust*)
The arrow in the word equation indicates ...
 - The rate of the reaction
 - The reactants produced
 - The products produced
 - What is used in the reaction
- A chemical equation may look complicated, but, by knowing what you know now, it should be much easier to understand
$$\text{HC}_2\text{H}_3\text{O}_2(\text{l}) + \text{NaHCO}_3(\text{g}) \rightarrow \text{NaC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$$
This chemical equation happens when you mix ...
 - vinegar and calcium carbonate
 - carbon dioxide and flavored water
 - calcium carbonate and water
 - vinegar and baking soda
- The following word equation identifies what happens when hydrogen peroxide is left out in the sun. It changes to water and oxygen gas.
 - Water + Oxygen \longrightarrow Hydrogen peroxide
 - Hydrogen peroxide + Energy \longrightarrow Water + Oxygen
 - Water + Energy + Oxygen \longrightarrow Hydrogen peroxide
 - Hydrogen peroxide + Oxygen \longrightarrow Water + Energy
- Use the following chemical reaction word equation to answer the question.
wood + oxygen \longrightarrow carbon dioxide + water + energy released
The reactants in this chemical word equation are ...
 - wood and oxygen
 - wood and energy
 - oxygen and energy
 - carbon dioxide and water
- To treat an injury in sport, **cold packs** are used to reduce the swelling where the injury occurs. These cold packs are examples of ...
 - Endothermic reactions
 - Exothermic reactions
 - Combustion reactions
 - Corrosion reactions

Topic 8 Reaction Rate

What are the 4 main factors that change the speed of a chemical reaction?

Explain how a catalyst works.

Explain how an inhibitor works.

What is a corrosion effect that can be seen on parliament buildings?

Explain the process of galvanization.

Explain electroplating.

What three things are needed for combustion reactions?

List some harmful by-product of combustion.

Illustrate 2 molecular models and 2 ionic models

| | |
|--|--|
| | |
| | |

Topic 8 - Reaction Rate

- A catalyst was used in an experiment. The effect that the catalyst had was ...

 - There was no effect at all
 - The reaction happened faster
 - The reaction happened slower
 - The reaction produced more products
- Enzymes are catalysts used in our body to break down food. Without the presence of enzyme the reactions in our body would ...

 - require much higher temperatures
 - produce different substances
 - happen more quickly
 - not occur at all
- Some substances are used in foods to slow down decomposition. Plant seeds prevent germination until the right conditions are present by these natural ...

 - reactors
 - enzymes
 - catalysts
 - inhibitors
- By crushing a tablet of medicine before you take it, you are changing the reaction rate by changing the ...

 - temperature
 - surface area
 - concentration
 - a catalyst
- Corrosion protection involves protecting metal from contact with the environment and the factors that affect the reaction rate of this chemical reaction. Coating a corrosive metal with a thin layer of zinc is called ...

 - galvanization
 - sterilization
 - electrolysis
 - electroengineering
- $$\begin{array}{ccccccc}
 & \text{H} & \text{H} & \text{H} & & & \\
 & | & | & | & & & \\
 \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{H} & & \text{(Propane } \text{C}_3\text{H}_8 \text{)} \\
 & | & | & | & & & \\
 & \text{H} & \text{H} & \text{H} & & &
 \end{array}$$

The burning of propane (C_3H_8) in a barbeque is an exothermic reaction that produces heat to cook the food. If the heat is too intense, the products being cooked (will be burnt) will be changed into.

 - hydrocarbons
 - hydrogen dioxide
 - carbon monoxide
 - pure carbon
- Burning fossil fuels (such as propane) produces carbon monoxide, carbon dioxide, sulfur oxides, nitrogen oxides, smoke, soot, ash and heat. These products are called ...

 - pesticides
 - pollutants
 - combustibles
 - hydrocarbons

Unit B: Matter and Chemical Change

Outcome # 1- Describe materials in terms of physical and chemical properties.

| Essential Outcomes (Ideas I must understand) | My Understanding |
|---|------------------|
| <ul style="list-style-type: none"> • Observe and give examples of different properties of materials. | 1 2 3 4 |
| <ul style="list-style-type: none"> • Classify materials based on composition and properties including: <ul style="list-style-type: none"> ➢ Pure substances, solutions, and mechanical mixtures ➢ Distinguishing between metals and nonmetals ➢ Applying other methods of classification | 1 2 3 4 |
| Important Outcomes (Ideas that are important to know and be able to do) | My Understanding |
| <ul style="list-style-type: none"> • Be able to tell when the properties of a material have changed and if a new substance has been produced. | 1 2 3 4 |

Outcome # 2- Identify patterns in chemical reactions.

| Essential Outcomes (Ideas I must understand) | My Understanding |
|---|------------------|
| <ul style="list-style-type: none"> • Understand the dangers of some materials and some explosive reactions | 1 2 3 4 |
| <ul style="list-style-type: none"> • Understand and describe patterns of chemical change by: <ul style="list-style-type: none"> ➢ Defining, giving examples of, and observing endothermic and exothermic reactions ➢ Describing conditions that affect reaction rates ➢ Proving the Law of Conservation of Mass. | 1 2 3 4 |
| Important Outcomes (Ideas that are important to know and be able to do) | My Understanding |
| <ul style="list-style-type: none"> • Describe evidence of chemical change in reactions by: <ul style="list-style-type: none"> ➢ Describing combustions and corrosion ➢ Understanding evidence of chemical reactions of household materials | 1 2 3 4 |
| <ul style="list-style-type: none"> • Tell the difference between materials that react easily and those that do not. | 1 2 3 4 |

Outcome # 3- Use ideas and examples, past and present, to understand the why matter behaves the way it does.

| Essential Outcomes (Ideas I must understand) | My Understanding |
|---|------------------|
| <ul style="list-style-type: none"> Using patterns and properties of substances, understand why the periodic table is arranged like it is, concentrating on the first 18 elements only. | 1 2 3 4 |
| <ul style="list-style-type: none"> Use the periodic table to identify the # of protons, and electrons, and other characteristics of different elements. Also identify the relationship of atoms that are in the same groups of the periodic table and why their properties are the same. | 1 2 3 4 |
| <ul style="list-style-type: none"> Tell the difference between ionic and molecular properties, giving examples of and describing the properties of each. | 1 2 3 4 |
| Important Outcomes (Ideas that are important to know and be able to do) | My Understanding |
| <ul style="list-style-type: none"> Tell the difference between a theory and an observation. Give examples of how models and theories are used to explain observations | 1 2 3 4 |

Outcome # 4- Use chemical names and formulas to describe elements, compounds and chemical reactions.

| Essential Outcomes (Ideas I must understand) | My Understanding |
|---|------------------|
| <ul style="list-style-type: none"> Read and understand the chemical formula for compounds containing two elements and give the proper scientific name and common name of the compound. | 1 2 3 4 |
| <ul style="list-style-type: none"> Understand why atoms combine in fixed ratios, and use ion charges to predict the ratio of atoms in ionic compounds made out of two elements. | 1 2 3 4 |
| <ul style="list-style-type: none"> Describe some chemical reactions and write word equations and use chemical formulas for the reactions. | 1 2 3 4 |
| Important Outcomes (Ideas that are important to know and be able to do) | My Understanding |
| <ul style="list-style-type: none"> Assemble or draw simple models of molecular and ionic compounds. | 1 2 3 4 |
| Outcomes Worth Being Familiar With | My Understanding |
| <ul style="list-style-type: none"> Identify chemicals commonly found in the home and write chemical symbols. | 1 2 3 4 |