

Coach Book – Interactions of Matter

Part 1: Atoms and Elements

Directions: Read pages 10-12 in the Coach book at your desk and answer the following questions,

1. Define the following:

Matter –

Volume –

Mass -

Atom-

Element –

Pure substance –

2. _____ cannot be broken down into simpler substance by ordinary _____ means.
3. About _____ of the elements discovered by scientists are _____ occurring. The remaining elements are _____, or made by _____ in the _____.
4. What is the smallest particle of an element? Draw out the bohr model of the carbon atom.
5. Describe where energy levels are located and what they are.
6. What is the difference between the atomic number and the atomic mass?
7. The number of _____ in the atom are equal to the number of _____.
8. Explain why the atom as a whole is electronically neutral.

9. Fill in the table below:

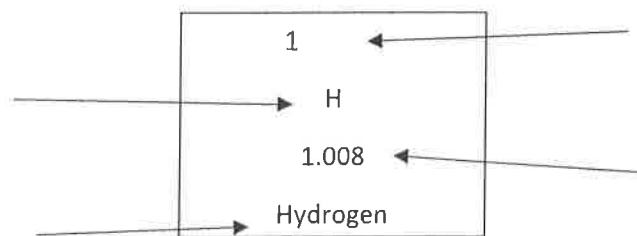
Particle	Mass	Charge	Location

10. The atomic number of gold is 79. How many neutrons are there in an atom of gold that has an atomic mass of 197 amu? Explain how you got your answer.

Part II: The Periodic Table

Directions: Read pages 14 – 17 in the Coach book and answer the following questions.

1. Who is responsible for creating the periodic table and how did he arrange it?
2. How is the periodic table arranged today?
3. Define and describe each:
Period –
Group –
4. Label the following:



5. What is the difference between a physical and chemical property? Provide examples of each.
6. Provide physical properties for the metals, nonmetal, and metalloids in the chart below.

Metal	Non metal	Metalloid

- Describe how the reactivity changes among families on the periodic table from left to right.
- Find the element copper (Cu) on the periodic table. What can you infer about copper's properties? Explain how its position in the periodic table helps you.

Part III: Molecules, Compounds, and Crystals

Directions: Read pages 19 – 20 in the Coach book and answer the following questions.

- How many atoms make up a molecule? Draw out an example of a molecule.
- What holds atoms together? Explain.
- What is a compound?
- How are elements and compounds similar?
- Write an example of a chemical formula that includes a subscript. Circle the subscript.
- What is a crystal?
- The chemical formula for water is H_2O . The chemical formula for hydrogen peroxide is H_2O_2 . Would you expect these two substances to have the same properties? Explain your answer.

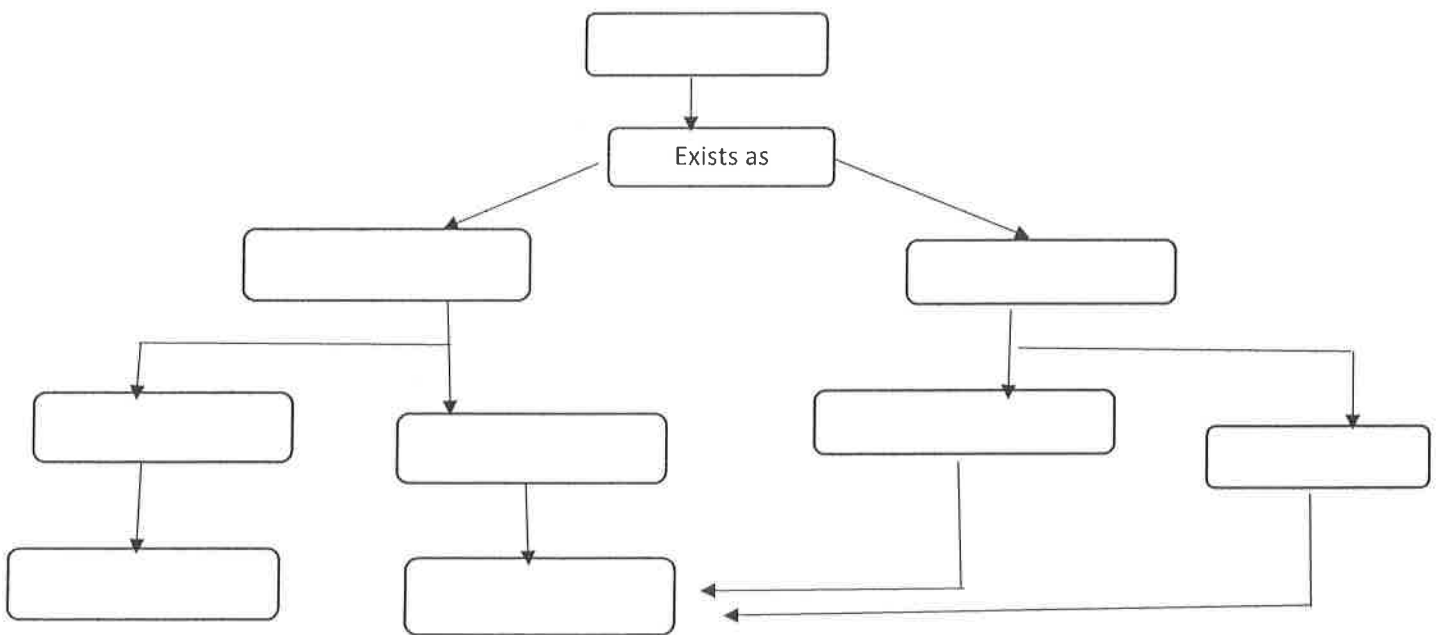
Part IV: Mixtures

Directions: Read pages 22-24 in the Coach book and answer the following questions.

- In the first paragraph "Getting the Idea," what example do they use and why can you see the examples different parts?
- Explain what a mixture is and then compare homogeneous versus heterogeneous mixtures.
- Substance in mixtures _____ their _____ properties. The makeup of a mixture can _____, unlike the elements that make up a compound which are found in the _____ proportions.

- List two examples from the book that show that mixtures can exist in all states of matter.
- Describe what a solution is and the two different parts of a solution. Label the two parts of sugar water and explain how sugar water mixes.
- What are the three different ways mixtures can be separated by physical means and explain each?

Fill in the blank boxes below:



Part V: Physical and Chemical Changes

Directions: Read pages 27 – 30 in the Coach book and answer the following questions.

	Physical Property	Physical Change	Chemical Property	Chemical Change
Definition				
Examples				

1. What is the equation for density?
2. Describe the two different parts of a solution?
3. What will happen if the maximum amount of solute is reached?
4. How does the temperature affect solubility?
5. Define the following:
 - Chemical Bond –
 - Chemical reaction -
6. List four signs of a chemical reaction
 - A.
 - B.
 - C.
 - D.
7. Water's boiling point is _____.
8. Water's melting point is _____.

Part VI: Chemical Reactions and the Conservation of Mass

Directions: Read pages 33 – 35 in Coach Book and answer the following questions.

1. In "Getting the Idea" what are the two examples they discuss? Explain each.



2. Circle the reactant. Square the product. Highlight the yield sign. Draw a heart around the subscripts.
3. How many carbon atoms are there on the reactant side? _____
4. How many oxygen atoms are there on the product side? _____
5. How many carbon atoms are there on the product side? _____
6. What is the coefficient and where is it located in the formula?

7. What are the four steps you can follow to make sure an equation is balanced?

A.

B.

C.

D.

8. Balance the equation (SHOW YOUR WORK): _____ HgO \rightarrow _____ Hg + _____ O₂

9. What is the Law of Conservation of Mass?

10. What is a closed system? Why is it important to study a chemical reaction in a closed system?