



TEACHER GUIDE

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STUDENT HANDOUTS

- Reading Comprehension

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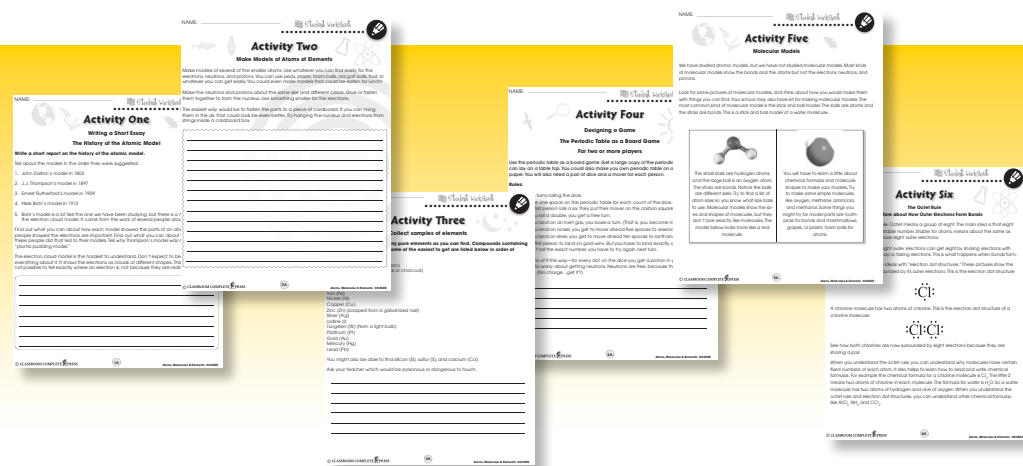
MINI POSTERS 23

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6 Bonus Activities!

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- Go to our website:
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- Click on item CC4505 – Atoms, Molecules & Elements
- Enter pass code CC4505D





Properties of Important Elements

1. Put a check mark (✓) next to the answer that is most correct.

a) How many protons are in an atom of boron (B)?

- A 2
 B 4
 C 5
 D 13

b) Which word describes both lithium (Li) and fluorine (F)?

- A inert
 B large
 C metallic
 D reactive

c) Which element is in all organic compounds?

- A calcium (Ca)
 B carbon (C)
 C iron (Fe)
 D sodium (Na)

2. Circle **T** if the statement is TRUE or **F** if it is FALSE.

- T F a) Group 18 elements are inert.
 T F b) Group 17 elements are very reactive.
 T F c) Elements in the bottom rows of the periodic table have very small atoms.
 T F d) Hydrogen (H) has the simplest atoms of any element.
 T F e) Most metals react with oxygen.



Properties of Important Elements

Look at the periodic table again. Notice the two black lines. One line zigzags, like steps, and the other is a straight line. These lines separate three important kinds of elements.



The elements to the left of the zigzag line are called **metals**. The elements between the zigzag line and the straight line are called **nonmetals**. You already learned that the elements to the right of the straight line are called inert gases.

We said that inert gases almost never react. Metals usually react with nonmetals. This means many compounds are part metal atoms and part nonmetal atoms.



Three Group 11 Metals
 Three Group 17 Nonmetals

Which **TWO** groups of elements in the periodic table are **MOST** reactive? Answer by giving the group numbers.



Which **group** of elements is **LEAST** reactive?

Many metals react with oxygen (O) to form **metal oxides**. You have probably seen the oxide of iron (Fe). Its common name is rust. Most metals have other properties in common. Many metals are hard and shiny and melt at high temperatures. Some, like gold (Au), silver (Ag), and platinum (Pt), are used to make jewelry. Mercury (Hg) is the only common metal that is a liquid at room temperature.

Many metals can be bent into different shapes without breaking. Heat and electricity pass through most metals easily. Most metals sink in water.



Properties of Important Elements

1. What kind of properties do these elements have? Write a word from the list beside each name. Each word will be used twice.

metal

nonmetal

inert gas

- _____ a) oxygen (O)
 _____ b) helium (He)
 _____ c) carbon (C)
 _____ d) potassium (K)
 _____ e) tin (Sn)
 _____ f) xenon (Xe)

2. Circle **T** if the statement is TRUE or **F** if it is FALSE.

- T F a) Most elements are solids at room temperature.
 T F b) Heat moves easily through metals.
 T F c) Most nonmetals are shiny and bend easily.
 T F d) Most metals melt at low temperatures.
 T F e) Hydrogen (H), oxygen (O), and carbon (C) are in many organic compounds.



Properties of Important Elements

3. In which parts of the periodic table are **metals**, **nonmetals**, and **inert gases** found?

4. Tell **two** ways that metals and nonmetals are different.

Extensions & Applications

5. Look at the periodic table on the next page. You will see that it has some blank squares. Some of the answers to the questions below you will write in these squares.

- a) What is the **atomic number** of the missing element between silicon (Si) and sulfur (S)? Write the number in the square.
- b) Calcium (Ca) has an atomic number of 20. Write the **symbol** and **atomic number** of calcium in the correct square.
- c) Lead (Pb) is a metal in the sixth row. Write the **symbol** for lead in the correct square.
- d) Radon (Rn) is an inert gas. Write the **symbol** for radon in the correct square.
- e) Carbon is a nonmetal in group 14. Write the **symbol** for carbon in the correct square.
- f) Which element has atoms with **13 protons**? _____
- g) How many **electrons** are in an atom of radium (Ra)? _____



Alchemists

Today, scientists that study elements and compounds are called **CHEMISTS**. Hundreds of years ago they were called **ALCHEMISTS**. They used science, but they were also something like magicians or wizards. They did discover many of the elements and laws of science, but they had some ideas that seem strange today. What they studied was called "alchemy."



Write a short report about the **history of the alchemists**. Find out which elements they discovered. Did they know what elements were? Is the story true that alchemists thought they could change lead into gold?

Use the space below to write notes as you conduct your research.



Crossword Puzzle!

Across

2. All particles are the same in a _____ material
3. The kind of molecules that contain carbon
6. The smallest bit of an element
8. An element that reacts easily with metals
12. Elements that don't react with anything are _____
13. An up-and-down row in the periodic table
14. A pure material made of more than one element
15. It connects atoms in a molecule



Down

1. A metal and oxygen form a metal _____
2. Found inside the nucleus of an atom
4. Groups 1 and 17 are very _____
5. What you call an atom or a molecule
7. It circles the nucleus
9. Bonds are formed by the _____ electrons
10. An atomic _____ shows how the parts of an atom are arranged
11. It is in the nucleus and has no charge

Word List		
Bond	Reactive	Inert
Outer	Oxide	Atom
Pure	Proton	Neutron
Organic	Compound	Model
Particle	Group	Electron
Nonmetal		

Comprehension Quiz

Part B

Answer each question in complete sentences.

1. Use the word "particle" to explain what a **pure material** is. Name the **two** kinds of particles. 3

2. Use the words "atom" and "material" to explain what an **element** is. 3

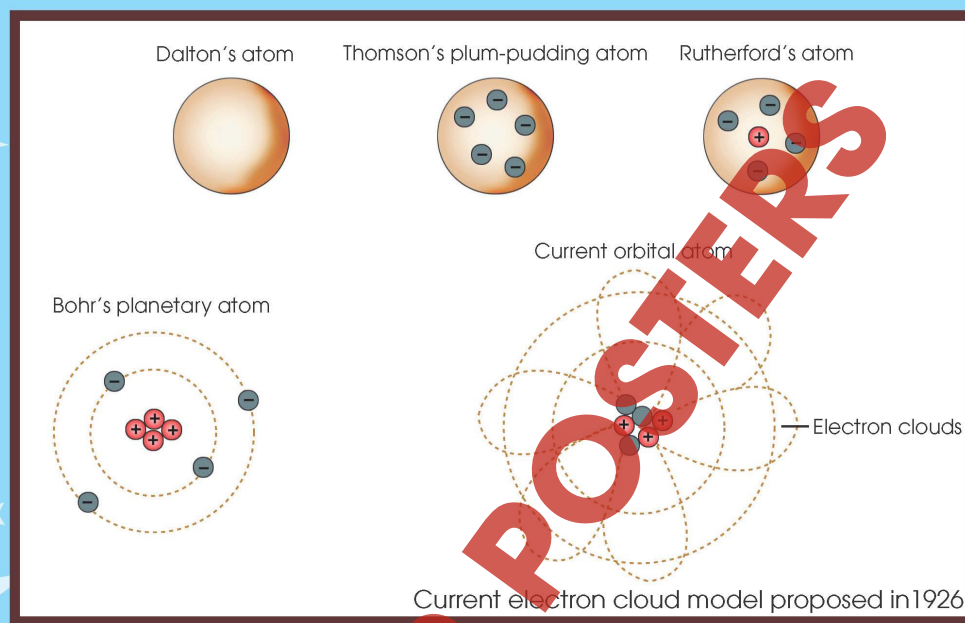
3. Use the words "element" and "material" to explain what a **compound** is. 3

4. Tell how the elements in a "group" in the periodic table are arranged. Use the word "electrons" to explain why elements in a group have the same kind of properties. Where are the elements with the smallest atoms found in a group? 4

5. Where are the **metals**, **nonmetals**, and **inert gases** found in the periodic table? 3

SUBTOTAL: /16

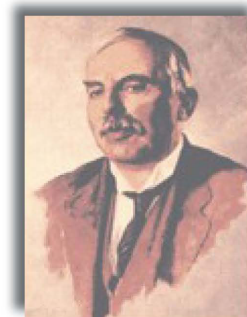
History of the Atomic Model



Dalton
1803



Thompson
1897



Rutherford
1909



Bohr
1913

NAME: _____

After You Read 



Properties of Important Elements

1. What kind of properties do these elements have? Write a word from the list beside each name. Each word will be used twice.

metal

nonmetal

inert gas

_____ a) oxygen (O)

_____ b) helium (He)

_____ c) carbon (C)

_____ d) potassium (K)

_____ e) tin (Sn)

_____ f) xenon (Xe)

2. Circle **T** if the statement is TRUE or **F** if it is FALSE.

T F a) Most elements are solids at room temperature.

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T F d) Most metals melt at low temperatures.

T F e) Hydrogen (H), oxygen (O), and carbon (C) are in many organic compounds.

1.

a) nonmetal

b) inert gas

c) nonmetal

d) metal

e) metal

g) inert gas

2.

a) **T**

b) **T**

c) **F**

d) **F**

e) **T**

10

3.

Metals are on the left, nonmetals are in the top right (or right), and inert gases are on the far right (or Group 18).

4.

Two of:

Metals have higher melting points.
Metals conduct heat better.
Metals conduct electricity better.
Metals are shinier.
Metals bend easier.
Metals react with nonmetals, and nonmetals react with metals.

5.

a) In Row 3, Group 15: 15

b) In Row 4, Group 2: 20

c) In Row 6, Group 14: Pb

d) In Row 6, Group 18: Rn

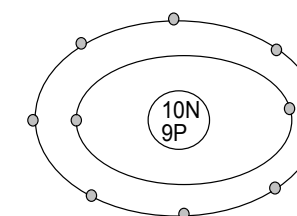
e) In Row 2, Group 14: C

f) Al

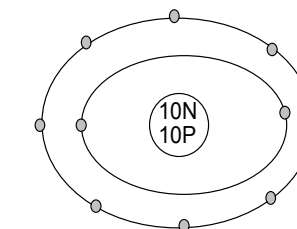
g) 88

11

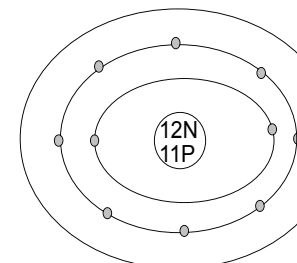
Fluorine:



Neon:



Sodium:



EASY MARKING ANSWER KEY