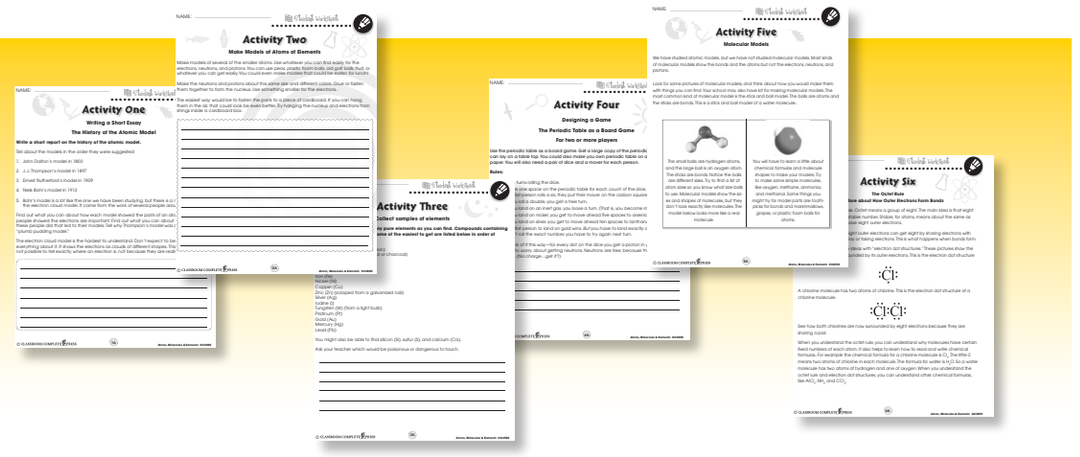
Contents

TEACHER GUIDE

STUDENT HANDOUTS



NAME: _____

Before You Read

The Periodic Table

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

a) What gives the atoms of an element their chemical properties?

- ○ **A** the inner protons
- ○ **B** the outer protons
- ○ **C** the inner electrons
- ○ **D** the outer electrons

b) What is different for atoms of every element?

- ○ **A** the number of electrons
- ○ **B** the size of the electrons
- ○ **C** the mass of the electrons
- ○ **D** the number of outer electrons

c) What is a chemical symbol?

- ○ **A** the matter at the center of an atom
- ○ **B** a model showing the parts of an atom
- ○ **C** the most important property of an element
- ○ **D** a short way to write the name of an element

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

T F **a)** Some elements have the same chemical and physical properties.

T F **b)** Scientists discovered most of the elements thousands of years ago.

T F **c)** Atoms of every element have a different number of protons.

T F **d)** All atoms of an element have the same chemical properties.

T F **e)** Molecules can be divided into smaller parts called compounds.

NAME: _____

Reading Passage

The Periodic Table

It all became clear when they learned about electrons and protons. Remember that it is the outer electrons that form bonds. Also remember that the way atoms form bonds is what gives an element its chemical properties. So the reason properties repeat is because the number of outer electrons repeats. If atoms of two elements have the same number of outer electrons, they form bonds in the same way.

STOP

Where are the ELECTRONS found in an atom? Where are the PROTONS found in an atom? Use the word "nucleus" in your answers.

_____

_____

Look at the periodic table. Each square has the symbol of a different element. Some of the symbols do not look like the names of the elements. For example, the symbol for gold is "Au". The numbers in the squares are called **atomic numbers**. Notice that the numbers get bigger from left to right in each row. The atomic number is equal to the number of protons in the nucleus of each atom of that element. The atomic number is also equal to the number of electrons. So each element has one more proton and one more electron than the element just before it.

Each up-and-down row is called a **group**. The groups are numbered from 1 to 18 across the top of the table. Next we will learn what the periodic table shows about properties of the elements.

Sometimes we will put the symbol of an element after its name, so you can find it in the periodic table. For example: hydrogen (H) or helium (He).

After You Read

NAME: _____

The Periodic Table

1. Fill in each blank with a word or group of words from the list.

atomic number | element | symbol | group | atom

a) The periodic table lists all the _____s in order of increasing _____s.

b) The letter "C" is the _____ for the element carbon.

c) In the periodic table, elements in the same _____ have many of the same properties.

d) Elements with the smallest _____s are near the top of the periodic table.

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

a) What repeats when elements are arranged in order of increasing atomic mass?

- ○ **A** size of atoms
- ○ **B** atomic numbers
- ○ **C** chemical properties
- ○ **D** number of electrons

b) What did scientists study to make the first periodic table?

- ○ **A** atomic models
- ○ **B** outer electrons
- ○ **C** each atom's nucleus
- ○ **D** properties of elements

NAME: _____

After You Read

The Periodic Table

3. Tell *three* things you can learn about an element by looking at one square in the periodic table.

_____

_____

4. Explain why the scientists who made the first periodic tables didn't understand why properties of elements repeated.

_____

_____

Extensions & Applications

5. A scientist from Russia, named **Dmitri Mendeleev,** made the **first** really good periodic table. Even though he drew up his table about 150 years ago, it is a lot like the one used today. Look for things to read about Mendeleev and his periodic table. Searching for his last name on the Internet will be some help. Your teacher may also have some books to help you.

a) When did he formally present his periodic table?

_____

b) Try to find out what other scientists thought of his periodic table.

_____

_____

_____

_____

c) He left some squares in his table **blank.** Why did he do this? How did this show later that his periodic table was correct?

_____

_____

d) One story says that the periodic table came to Mendeleev in a dream. Try to find out if this story is true.

_____

_____

Hands-On Activity # 2

Compounds and Molecules

On page 14, you saw pictures of the elements silver and sulfur and of the compound silver sulfide.

Try to find more pictures of elements and the compounds they form.

You can usually find a picture of a material on the Internet by searching for its name. Some websites have pictures of all the elements and some have pictures of many compounds. You may be able to find a periodic table that shows a picture of each element in its square.

If you cannot copy and print the pictures, try to **draw** or **describe** the materials. It is interesting when the compound looks very different from the elements they are made of.

Here are some elements and compounds you can look for. You can ask your teacher for other ones.

- **Elements sodium (Na) and chlorine (Cl) form the compound sodium chloride.**
- **Elements silver (Ag) and chlorine (Cl) form the compound silver chloride.**
- **Elements calcium (Ca) and carbon (C) form the compound calcium carbide.**
- **Elements lead (Pb) and sulfur (S) form the compound lead sulfide.**
- **Elements magnesium (Mg) and iodine (I) form the compound magnesium iodide.**

If you can find how the compound is used, tell about it below the pictures. You may find other interesting compounds to look for in books or by asking your teacher.

After You Read

NAME: _____

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		

Reading Passage

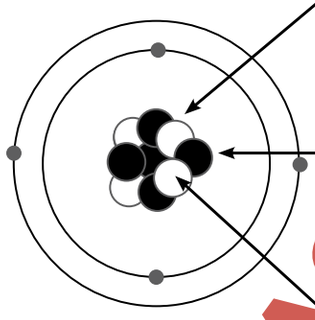
NAME: _____

Comprehension Quiz

25

Part A

This is a model of a beryllium atom.
Label each part of the atom. Tell the name, charge, and mass of the part. For charge, write **minus**, **plus**, or **zero**. For mass, write **not much** or **a lot**.



1. Name _____
2. Charge _____
3. Mass _____

3

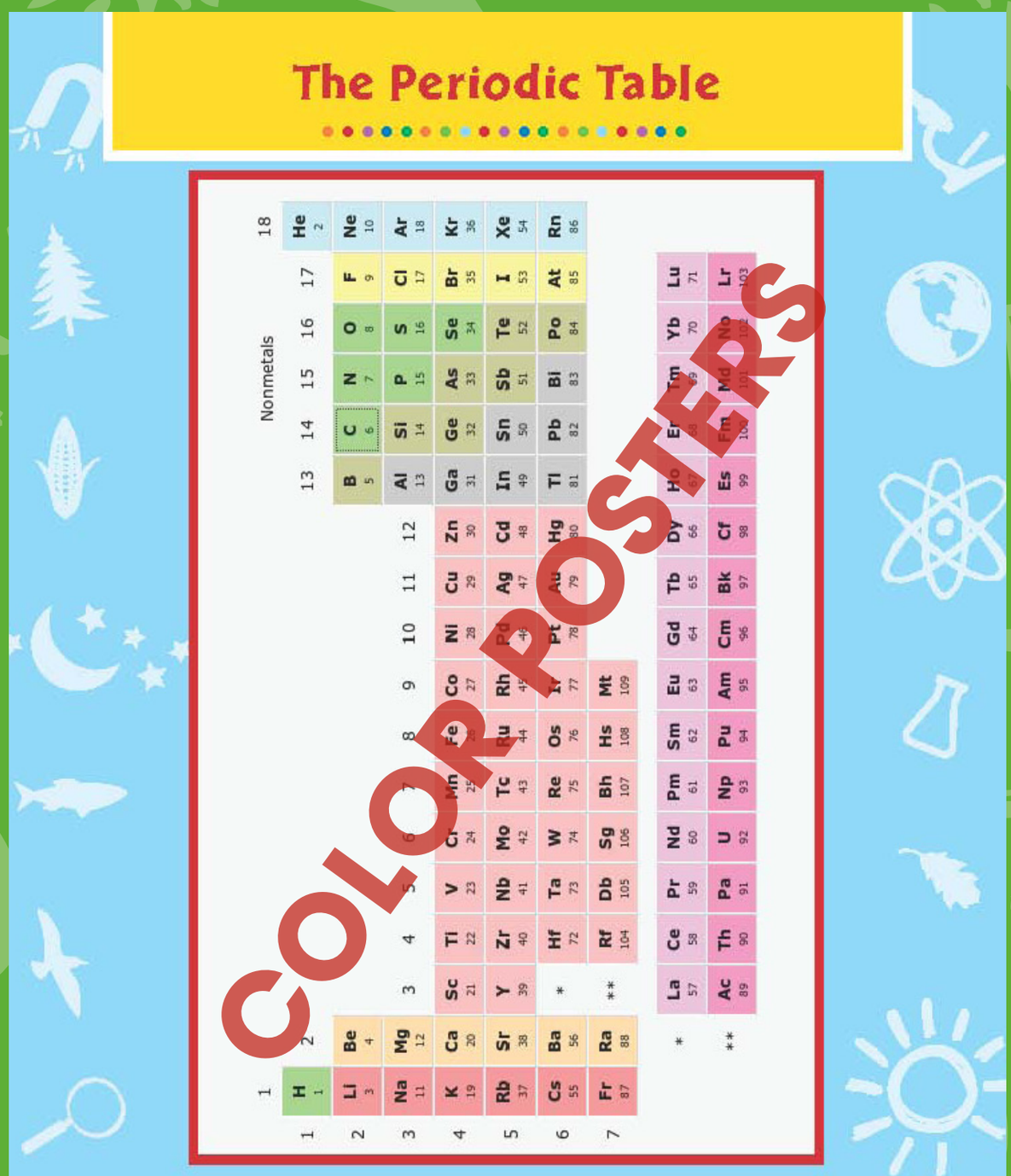
1. Name _____
2. Charge _____
3. Mass _____

3

1. Name _____
2. Charge _____
3. Mass _____

3

SUBTOTAL: /9



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After You Read

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_____

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_____

_____

EZ

3.

Three of: atomic number, number of protons in the atoms, number of electrons in the atoms, the element's name

4.

Accept one of:

They didn't have the atomic model. (OR) They didn't know about electrons.

5.

a) 1869

b) Possible answers:

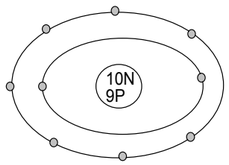
…idely accepted than …thers (Newlands', …) proposed about the same time.

Gained more acceptance when elements were discovered that he had used his table to predict.

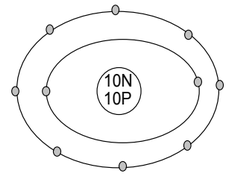
c) He thought some elements hadn't been discovered yet. He thought this because, if he left blanks, the known elements would follow the periodic law of repeating properties. When the elements were later discovered that filled the missing squares, it showed his periodic table had been correct.

d) A second-hand story; there is no record that he said the periodic table came to him in a dream. Someone said they *heard* Mendeleev said it.

Fluorine:



Neon:



Sodium: