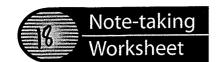
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# Properties of Atoms and the Periodic Table

#### **Structure of the Atom** Section 1

A.		are abbreviated in scientific shorthand—first letter or two of element's name					
В.		smallest piece of matter that still has the properties of the element					
	1.	1 have electrical charge of 1+.					
	2.	2 do not have an electrical charge.					
	3.	have electrical charge of 1					
	4.	Protons and neutrons are in the of an atom; electrons surround the nucleus.					
C.	Pr	Protons and neutrons are made up of smaller particles called					
	1. Quarks are studied by colliding accelerated charged particles with protons, which leave						
		tracks in a					
	2.	Six quarks are known to exist; the sixth is called the quark.					
D.	Sc	ientists use scaled-up to represent atoms.					
	1.	Early models of atoms used a solid					
	2.	Current model shows electrons traveling in specific energy levels around a nucleus of protons and neutrons.					
Se	cti	on 2 Masses of Atoms					
A.		—composed mostly of the protons and neutrons in the nucleus					
	1.	Unit of measurement for atomic particles is (amu) which is one-twelfth the mass of a carbon atom containing six protons and six neutrons.					
	2.	—the number of protons in an atom; number of protons also identifies the element					
	3.	The sum of the number of protons and neutrons in the nucleus of an atom is					
		the					
В.		—atoms of the same element with different numbers of neutrons					
	1.	Different isotopes have different					
	2.	Number of is equal to mass number minus atomic number.					
	3.	Name of followed by mass number identifies the isotope.					
	4.	is the weighted-average mass of an element's isotopes.					
-	5.	Average atomic mass is closest to its most isotope.					

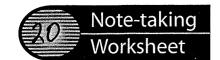
**Meeting Individual Needs** 

Meeting Individual Needs

### Note-taking Worksheet (continued)

#### The Periodic Table Section 3

A.	Ele	ements are organized in the by increasing atomic number.				
	1.	In the late 1800's, Dmitri Medeleev devised the first periodic table based on				
	2.	In 1913, Henry G. J. Moseley arranged the elements by rather than atomic mass.				
В.	Ve	rtical columns in the periodic table are of elements with similar properties.				
	1.	Elements in the same group have the same number of in their outer energy level.				
	2.	Each of the seven energy levels can have a number of electrons.				
		a. Energy level one can contain at most electrons.				
		<b>b.</b> Energy level two can contain at most electrons.				
	3.	Each row in the periodic table ends when an outer energy level is				
	4.	use the element symbol and dots to represent outer energy level electrons.				
C.		—horizontal rows of elements that contain increasing numbers of protons and ectrons.				
	1.	1. Elements are as metals, nonmetals, or metalloids (semimetals).				
	2.	Elements are in laboratories all over the world.				
D.	Th	elements exist all over the universe.				
	1.	Hydrogen and helium are the of other naturally occurring elements.				
	2.	spread heavier elements throughout the universe.				



# **Elements and Their Properties**

Date

#### **Section 1 Metals**

A.	Pr	operties of				
	1.	heat and electricity				
	2.					
	3can be hammered or rolled into sheets					
4—can be drawn into wires						
5						
	6.	6positively charged metallic ions are surrounded by a cloud of electrons; ions are in sliding layers and electrons are weakly held; readily form ionic bonds with nonmetals				
B.	Th	ne Metals—softer and more reactive than other metals				
	1.	Highly with oxygen and water; don't occur naturally as elemental forms				
	2. Combine readily with other elements due to electron in outer energy level					
	3.	uses				
		a. Human health—,, and compounds				
		<b>b.</b> Photocells—some depend on or				
		c. Francium—a element which breaks down giving off particles and energy				
C.	Th in	Metals—not found naturally in elemental form; electron outer energy level				
	1.	Applications— and magnesium found in fireworks; in				
		vehicles, ladders, and bats; in statues and countertops				
	2.	Human body— in bones; in disease diagnoses; radium formerly used in cancer treatment				
D.		Elements –they often occur in nature as uncombined elements				
	1	Typically form colored compounds—found in rubies and emeralds				

**Meeting Individual Needs** 

# Note-taking Worksheet (continued)

	2.	Iron	—iron, cobalt, and nickel					
		ain Earth	most widely used of all metals and main ingredient in	; abundant				
		b	and nickel—used in some steels					
		c	used to coat other metals					
	3.	Copper, silv	ver, gold— metals since once were commonly us	ed in coins				
		a	used in electric wiring because it is a superior electricit	y conductor				
		b	used in photographic film and paper; jewelry					
		c	used in jewelry					
	4.	Zinc, cadm	nium, mercury—group on periodic table					
		a. Zinc and	doften used to coat or plate other metals					
		b	only room temperature liquid metal; used in thermor	neters and batteries				
E.	Th	.e	Metals—seem disconnected from the rest of p	eriodic tables				
	1.			m, amarium,				
	2.	The		_ is the best known.				
Se	cti	on 2 No	onmetals					
A.	Pro	operties of _	solids at roon	n temperature; are				
		t malleable ually not lus	or; usually poor of heat and estrous	electricity;				
	1.		compounds—form when nonmetals gain from the from th	om metals and				
		become	ions					
	2 compounds—form when nonmetals share electrons with							
		other						
В.			most common element in universe	· ·				
			two atoms of the same element in	bond				
			element found mostly on Earth as part of water co					
			include bromine, iodine,,,					
			forms when a halogen gains one electron from a metal.					

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### Note-taking Worksheet (continued)

2. Use of halogens

a. \_\_\_\_\_disinfectant and bleach

**b.** —dyes in cosmetics

**c.** \_\_\_\_hormone regulation

3. \_\_\_\_\_\_a solid changes directly into a gas without first becoming a liquid

**D.** The \_\_\_\_\_\_exist as isolated, stable atoms

1. \_\_\_\_\_\_used in blimps and balloons

2. Neon, \_\_\_\_\_, and \_\_\_\_\_used in lights

#### **Mixed Groups** Section 3

nonmetallic properties; partial conduction gives them \_\_\_\_\_ characteristics.

**B.** The \_\_\_\_\_\_named for the first element in Group 13

1. \_\_\_\_\_\_used in water softening products, antiseptics, and fuels

and aircraft

C. The \_\_\_\_\_ Group—four electrons in outer energy level

1. \_\_\_\_found in coal, oil, natural gas, and foods

2. Silicon occurs as an allotrope—same element with different molecular structures

a. found in sand, rocks, and soil

**b.** The main component in \_\_\_\_\_\_, which conduct electricity under certain conditions

**3.** —also used in semiconductors

4. \_\_\_\_\_\_ used to coat other metals

5. \_\_\_\_\_\_toxic, so no longer used in paint

**6.** Diamonds, graphite, and buckminsterfullerene are all \_\_\_\_\_\_ of carbon.

D. The \_\_\_\_\_ Group—five electrons in outer energy level; tend to form covalent bonds

1. \_\_\_\_\_\_\_used to make nitrates and ammonia

2. \_\_\_\_\_\_used in water softeners, fertilizers, match heads, fine china

3. \_\_\_\_\_ and \_\_\_\_ used with other metals to lower their melting points

### Note-taking Worksheet (continued)

E. The \_\_\_\_\_ Group or Group 16 1. \_\_\_\_\_makes up 20% of air, is used by living things in respiration, and provides protection from Sun's radiation 2. \_\_\_\_\_used to form sulfides for pigment in paint 3. \_\_\_\_\_used in photocopiers and multivitamins 4. \_\_\_\_\_ and \_\_\_\_ are also oxygen group elements. Elements—scientists create elements not usually found on \_\_\_\_\_; synthetic elements usually disintegrate quickly. 1. Uranium can be made into \_\_\_\_\_ which forms plutonium when it disintegrates. 2. Plutonium can be changed into \_\_\_\_\_\_, which is used in \_\_\_\_\_ detectors. 3. \_\_\_\_\_\_ elements have more than \_\_\_\_\_ protons and are synthetic and unstable. a. The study of synthesized elements helps scientists to understand the \_\_\_\_\_ holding the \_\_\_\_\_ together. **b.** Element 114 lasted for seconds. **c.** It combined 114 protons with \_\_\_\_\_ neutrons. **d.** It broke apart due to enormous \_\_\_\_\_\_ between the protons.