Quick Guide to the Periodic Table

The Periodic Table is a list of all the known elements. It is organized by increasing **atomic number**. There are two main groups on the periodic table: **metals** and **nonmetals**. The left side of the table contains elements with the greatest metallic properties. As you move from the left to the right, the elements become less metallic with the far right side of the table consisting of nonmetals. The elements in the middle of the table are called "transition" elements because they are changed from metallic properties to nonmetallic properties. A small group whose members touch the zigzag line are called **metalloids** because they have both metallic and nonmetallic properties.

The table is also arranged in vertical columns called "**groups**" or "**families**" and horizontal rows called "**periods**." Each arrangement is significant. The elements in each vertical column or group have similar properties. Group 1 elements all have 1 electron in their outer shells. This gives them similar properties. Group 2 elements all have 2 electrons in their outer shells. This also gives them similar properties. Not all of the groups, however, hold true for this pattern. The elements in the first period or row all have one shell. The elements in period 2 all have 2 shells. The elements in period 3 have 3 shells and so on.

There are a number of major groups with similar properties. They are as follows:

Hydrogen: This element does not match the properties of any other group so it stands alone. It is placed above group 1 but it is not part of that group, as it is a non-metal. It is a very reactive, colorless, odorless gas at room temperature. (1 outer level electron)

Group 1: **Alkali Metals** – These metals are extremely reactive and are never found in nature in their pure form. They are silver colored and shiny. Their density is extremely low so that they are soft enough to be cut with a knife. (1 outer level electron)

Group 2: **Alkaline-earth Metals** – Slightly less reactive than alkali metals. They are silver colored and more dense than alkali metals. (2 outer level electrons)

Groups 3 – 12: **Transition Metals** – These metals have a moderate range of reactivity and a wide range of properties. In general, they are shiny and good conductors of heat and electricity. They also have higher densities and melting points than groups 1 & 2. (1 or 2 outer level electrons)

Lanthanides and Actinides: These are also transition metals that were taken out and placed at the bottom of the table so the table wouldn't be so wide. The elements in each of these two periods share many properties. The lanthanides (first row) are shiny and reactive. The actinides (second row) are *all* radioactive and are therefore unstable. Elements 95 through 103 do not exist in nature but have been manufactured in the lab.

Group 13: **Boron Family/Group** – Contains one metalloid and 4 metals. Reactive. Aluminum is in this group. It is also the most abundant metal in the earth's crust. (3 outer level electrons)

Group 14: **Carbon Family/Group** – Contains one nonmetal, two metalloids, and two metals. Varied reactivity. (4 outer level electrons)

Group 15: **Nitrogen Family/Group** – Contains two nonmetals, two metalloids, and one metal. Varied reactivity. (5 outer level electrons)

Group 16: **Oxygen Family/Group** – Contains three nonmetals, one metalloid, and one metal. Reactive group. (6 outer level electrons)

Group 17: **Halogens** – All nonmetals. Very reactive. Poor conductors of heat and electricity. Tend to form salts with metals. Ex. NaCl: sodium chloride also known as "table salt". (7 outer level electrons)

Group 18: **Noble Gases** – Unreactive nonmetals. All are colorless, odorless gases at room temperature. All found in earth's atmosphere in small amounts. (8 outer level electrons)

Color Coding the Periodic Table

COLOR WITH COLORED PENCIL

***Types of Elements**:*

____ trace the **zigzag line** that separates the metals & nonmetals in black

____ color **all metalloids** light green

____ color **all metals** yellow

____ color **all nonmetals** light blue

COLOR WITH COLORED PENCIL

States of Matter:

____ outline in purple the elements that are **liquids at room temp.**

____ outline in red the elements that are **gases at room temp**.

____ leave all the elements that are **solid at room temp**. blank

Periods:

____ In the upper left hand corner, write down "Periods numbers 1-7 tell the number of energy levels that an element has"

____ label the # of energy levels next to each **period**

Families/Groups:

____ label the # of valence electrons above each **family/group (except for 3-12)**

____ draw a green dot in the top left corner of all the **alkali metals**

____ draw a blue dot in the top left corner of all the **alkaline earth metals**

____ draw an orange diagonal line across each of the **transition metals**

____ draw a purple dot in the top left corner of all the **lanthanides**

____ draw a red dot in the top left corner of all the **actinides**

____ draw a "B" in the top left corner of all the **boron family members**

____ draw a "C" in the top left corner of all the **carbon family members**

____ draw an "N" in the topleft corner of all the **nitrogen family members**

____ draw an "O" in the bottom left corner of all the **oxygen family members**

____ draw a brown dot in the top left corner of all the **halogens**

____ draw a black dot in the top left corner of all the **noble gases**

Family Ties

Fill in the blanks below to label the major groups and divisions of the periodic table.

WORD BANK			
metal	family/group	alkali earth metals	noble gases
non-metal	period	actinides	lanthanides
metalloid	alkali metals	halogens	transition metals

1. The vertical columns on the periodic table are called _____.
2. The horizontal rows on the periodic table are called _____.
3. Most of the elements in the periodic table are classified as _____.
4. The elements that touch the zigzag line are classified as _____.
5. The elements in the far upper right corner are classified as_____.
6. Elements in the first group have one outer shell electron and are extremely reactive. They are called _____ _____.
7. Elements in the second group have 2 outer shell electrons and are also very reactive. They are called _____ _____ _____.
8. Elements in groups 3 through 12 have many useful properties and are called _____ _____.
9. Elements in group 17 are known as “salt formers”. They are called _____.
10. Elements in group 18 are very unreactive. They are said to be “inert”. We call these the _____ _____.
11. The elements at the bottom of the table were pulled out to keep the table from becoming too long. The first period at the bottom is called the _____.
12. The second period at the bottom of the table is called the _____.

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Periodic Table of the Elements

1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110	111	112		114		116		118

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

KEY:

- ☐ Metals
- ☐ Nonmetals
- ☐ Metalloids
- ☐ Solid
- ☐ Liquid
- ☐ Gas

Families/Groups:

- ☐ Alkali metals
- ☐ Alkali earth metals
- ☐ Transition metals
- ☐ Lanthanides
- ☐ Actinides
- ☐ Boron family
- ☐ Carbon family
- ☐ Nitrogen family
- ☐ Oxygen family
- ☐ Halogens
- ☐ Noble gases