

# Color Coding the Periodic Table

## Student Information Sheet

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 the 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. 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 are shiny and reactive. The actinides 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 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 Group – Contains one nonmetal, two metalloids, and two metals. Varied reactivity. (4 outer level electrons)

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

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

Groups 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)

Groups 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*

### *Student Worksheet*

This worksheet will help you understand how the periodic table is arranged. Your teacher will give you a copy of the periodic table to color. Using map pencils, color each group on the table as follows:

1. Color the square for Hydrogen pink.
2. Lightly color all metals yellow.
3. Place black dots in the squares of all alkali metals.
4. Draw a horizontal line across each box in the group of alkaline earth metals.
5. Draw a diagonal line across each box of all transition metals.
6. Color the metalloids purple.
7. Color the nonmetals orange.
8. Draw small brown circles in each box of the halogens.
9. Draw checkerboard lines through all the boxes of the noble gases.
10. Using a black color, trace the zigzag line that separates the metals from the nonmetals.
11. Color all the lanthanides red.
12. Color all the actinides green.

When you are finished, make a key that indicates which color identifies which group.

[Add copy of bottom half "Placing All You Elements on the Table"](#)

[Insert copy of periodic table](#)

# Family Ties

## Student Worksheet

Follow the instructions below to label the major groups and divisions of the periodic table.

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 called the \_\_\_\_\_.
12. The second period at the bottom of the table is called the \_\_\_\_\_.