

# Periodic Table

**Fifth Grade**

**Activity: 1**

**Time: 1 Class Period**

## General Description

The teacher will introduce the Periodic Table to the students. In fifth grade, students need to know only the very basics of the Periodic Table in order to understand what an atom and an element is.

## Objectives

Students will identify the basic structure of the Periodic table.

Students will identify specific elements using the Periodic Table.

## Arizona State Standards

SC05 S5C1 PO1 Identify that matter is made of smaller units called:

- molecules (e.g.,  $\text{H}_2\text{O}$ ,  $\text{CO}_2$ )
- atoms (e.g., H, N, Na)

## Teacher Information

The Periodic Table is divided several different ways. The first division is dividing the elements into rows and columns, formally referred to as Periods and Groups. Another division is to divide the elements into three main groups. The three groups are metals, non-metals, and metalloids. The table is also divided into those elements that are radioactive and those that are not.

## Materials

Teacher notes - Activity Card 5-1a

Periodic Table of Elements - Activity Card 5-1b

Colored printer paper

Research sources

Internet sites

Poster paper

## Procedures/Exploration

1. Divide the class into groups and assign each team a column (Group) of elements to investigate. Students will look for common properties and how those elements behave in their column (Group.)
2. Have the students share what they learned about their column (Group) of elements. Ask them what pattern they discovered.
3. Explain to the students that the columns are formally called Groups in the Periodic and they all have similar properties and react the same way in similar situations.
4. Explain to the students that the rows are called Periods because the properties across a row will gradually change. The elements also grow in atomic size.
5. Tell the students this is one way the Periodic Table is divided.
6. Ask students if they know of another way the Periodic Table might be divided.
7. Lead them to discover the coloring.

8. Explain that the table is divided into metals, metalloids, and non-metals.
9. Color their own periodic table according which are metals, non-metals, and metalloids.
10. Under each section put the characteristics of those divisions.
11. Finally, explain that each square is a different element.

# Periodic Table

## Teacher Notes

**Fifth Grade**  
**Activity: 1**  
**Activity Card: 5-1a**

### Periodic Table

- ◆ Originally Dmitri Mendeleev began to organize the Periodic Table of elements by looking at patterns.
- ◆ Many elements were not in the first Periodic Table as they were not discovered yet.
- ◆ Horizontal rows are called the periods.
- ◆ Vertical columns are called the groups.
- ◆ Those elements found in the same column have similar chemical and physical properties.

### Properties

- ◆ Properties are determined by the number of electrons in the outer energy level of the atom.
- ◆ Those with the same number in the outer shell will be in the same group.
- ◆ According to the Bohr model of an atom, there are several shells or energy levels for the electrons to travel in.
- ◆ The energy levels have a predetermined number of electrons it can hold.
- ◆ The first layer will hold up to as many as two electrons.
- ◆ The second layer can hold up to as many as eight electrons.
- ◆ The third layer can hold up to as many as 18 electrons.
- ◆ The fourth layer can hold as many as 32 electrons.
- ◆ The outer most shell of any atom will never have more than eight electrons.
- ◆ Example of similar properties:  
***Group 1:*** All those elements in Group One will react explosively if combined with water.
- ◆ The periodic table is also split into three main groups. Those groups are metals, non-metals, and metalloids.

### Metals

- ◆ Three or fewer electrons in the outer shell
- ◆ Good conductor of heat and electricity
- ◆ Luster (shiny)
- ◆ Malleable (can be pounded into shapes)
- ◆ Ductile (can be stretched into wire)
- ◆ Solid at room temperature
- ◆ Exception to the rule: Hg (Mercury) liquid at room temperature.
- ◆ Made up of a metallic bond.

### **Metallic Bond**

- ◆ An ion is an atom that has either gained or lost an electron.
- ◆ Metallic bond is the attraction between electrons and ions
- ◆ Loosely bound electrons allow electric current to flow easily. This explains why metals are such good conductors.
- ◆ Remember that isotopes are different than ions.

### **Non-Metals**

- ◆ Five or more electrons in the outer shell
- ◆ All in Group 17 & 18 are non-metals
- ◆ Lack luster
- ◆ Do not conduct heat or electricity
- ◆ Not ductile
- ◆ Not malleable
- ◆ Found as a solid and as a gas
- ◆ Exception: Br (Bromine) is the only liquid non-metal

### **Metalloids**

- ◆ Has properties of both metals and non-metals
- ◆ Found along the zigzag line.
- ◆ Can behave as a metal or a non-metal.

# Periodic Table

Fifth Grade  
Activity: 1  
Activity Card: 5-1b

Student's Name:

Date:

1  
LIGHT METALS

# Periodic Table of The Elements

In the periodic table, the elements are arranged in order of increasing atomic number. Vertical columns headed by Arabic numerals are called **Groups**. A horizontal sequence of elements is called a **Period**. Groups 1 and 2 are called **alkali metals** at the top right and bottom left of the table. The staggered line (Groups 13-17) roughly separates metallic from non-metallic elements.

**Groups**—Elements within a group have similar properties and contain the same number of electrons in their outside energy. The first group (1) includes hydro-

gen and the alkali metals. The *inert gases*.  
—Group 17 includes the **halogens**.  
—Groups 2 and 13 are called **transition elements**.  
—Short vertical columns without Arabic numeral headings are called **boron**.  
**Periods**—In a given period the properties of the elements gradually pass from a strong metallic to a strong non-metallic character. The last number of a period being an inert gas.

## NON METALS

Hydrogen 1.0080 1	Helium 4.003 2																
Lithium 6.939 3	Beryllium 9.012 4	Boron 10.811 5	Carbon 12.0115 6	Nitrogen 14.007 7	Oxygen 15.999 8	Fluorine 18.998 9	Neon 20.183 10										
Sodium 22.990 11	Magnesium 24.312 12	Aluminum 26.981 13	Silicon 28.086 14	Phosphorus 30.974 15	Sulfur 32.064 16	Chlorine 35.453 17	Argon 39.948 18										
Potassium 39.098 19	Calcium 40.078 20	Gallium 69.72 31	Zinc 65.37 30	Nickel 58.71 28	Copper 63.54 29	Brine 79.909 35	Krypton 83.80 36										
Rubidium 85.47 37	Sr 87.62 38	Yttrium 88.905 39	Zirconium 91.22 40	Niobium 92.906 41	Molybdenum 95.94 42	Technetium (99) 43	Ruthenium 101.07 44	Rhodium 102.91 45	Palladium 106.4 46	Silver 107.87 47	Cadmium 112.40 48	Indium 114.82 49	Tin 118.69 50	Antimony 121.75 51	Tellurium 127.60 52	Iodine 126.90 53	Xenon 131.30 54
Cesium 132.90 55	Ba 137.34 56	Lanthanum 138.91 57	Hafnium 178.49 72	Ta 180.95 73	Tungsten 183.85 74	Rhenium 186.21 75	Osmium 190.2 76	Iridium 192.22 77	Pt 195.09 78	Gold 196.97 79	Mercury 200.59 80	Thallium 204.37 81	Lead 207.19 82	Bismuth 208.98 83	Polonium (209) 84	Astatine (210) 85	Rn (222) 86
Francium 223 87	Ra (226) 88	Actinium 227 89	Unq 104 104	Unp 105 105	Unh 106 106	Uns 107 107	Uno 108 108	Une 109 109	110	111	112	113	114	115	116	117	118

Key

Color

Information

Name of Element

Atomic Weight

Atomic Symbol

Atomic Number

Protactinium 231.04 91	Th 232.04 90	U 238.03 92	Np 237 93	Pu 242 94	Am 243 95	Cm 247 96	Bk 247 97	Cf 251 98	Es 254 99	Fm 257 100	Md 258 101	No 259 102	Lr 260 103				
														Yttrium 174.97 71	Lu		
														Yttrium 173.04 70	Yb		
														Yttrium 168.93 69	Tm		
														Yttrium 167.26 68	Er		
														Yttrium 164.93 67	Ho		
														Yttrium 162.50 66	Dy		
														Yttrium 158.92 65	Tb		
														Yttrium 157.25 64	Gd		
														Yttrium 151.96 63	Eu		
														Yttrium 150.35 62	Sm		
														Yttrium 144.24 61	Pm		
														Yttrium 140.91 59	Pr		
														Yttrium 138.91 57	La		
														Yttrium 137.34 56	Ba		
														Yttrium 136.91 55	La		
														Yttrium 135.90 54	Cs		
														Yttrium 132.90 53	Rb		
														Yttrium 88.905 39	Sr		
														Yttrium 87.62 38	Y		
														Yttrium 85.47 37	Rb		
														Yttrium 83.80 36	Kr		
														Yttrium 79.909 35	Br		
														Yttrium 78.96 34	Se		
														Yttrium 74.922 33	As		
														Yttrium 72.63 32	Ge		
														Yttrium 72.59 31	Ga		
														Yttrium 69.72 30	Zn		
														Yttrium 65.37 29	Cu		
														Yttrium 63.54 28	Ni		
														Yttrium 58.933 27	Co		
														Yttrium 58.71 26	Fe		
														Yttrium 55.847 25	Mn		
														Yttrium 54.938 24	Cr		
														Yttrium 51.996 23	V		
														Yttrium 50.942 22	Ti		
														Yttrium 47.88 21	Sc		

Key  
Information Color  
Name of Element Red  
Atomic Weight Yellow  
Atomic Symbol Black  
Atomic Number Green

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