

# THE PERIODIC TABLE

## Introduction

Chemical elements are shown in the Periodic Table. In this activity, you will learn the different groups and periods of these elements.

## Objectives

Here are your objectives for this activity:

- ✓ Identify the classifications of elements
- ✓ Answer questions about the properties of elements found on the Periodic Table
- ✓ Observe patterns on the behaviour of element groups and period
- ✓ Be familiar with the International Union of Pure and Applied Chemistry (IUPAC) terminology

## Exercise

1. Below is the Periodic Table of Elements. Using different shades, colour and label the following groups of elements:
  - a. Group 1 - The alkali metals
  - b. Group 2 - The alkali earth metals
  - c. Group 7 - Halogens
  - d. Group 0 - The noble gases

																				2 <b>He</b> Helium 4.003															
3 <b>Li</b> Lithium 6.941		4 <b>Be</b> Beryllium 9.012												1 <b>H</b> Hydrogen 1.008	5 <b>B</b> Boron 10.811		6 <b>C</b> Carbon 12.011		7 <b>N</b> Nitrogen 14.007		8 <b>O</b> Oxygen 15.999		9 <b>F</b> Fluorine 18.998		10 <b>Ne</b> Neon 20.180										
11 <b>Na</b> Sodium 22.990		12 <b>Mg</b> Magnesium 24.305												13 <b>Al</b> Aluminum 26.982		14 <b>Si</b> Silicon 28.086		15 <b>P</b> Phosphorus 30.974		16 <b>S</b> Sulfur 32.066		17 <b>Cl</b> Chlorine 35.453		18 <b>Ar</b> Argon 39.948											
19 <b>K</b> Potassium 39.098	20 <b>Ca</b> Calcium 40.078	21 <b>Sc</b> Scandium 44.956	22 <b>Ti</b> Titanium 47.867	23 <b>V</b> Vanadium 50.942	24 <b>Cr</b> Chromium 51.996	25 <b>Mn</b> Manganese 54.938	26 <b>Fe</b> Iron 55.845	27 <b>Co</b> Cobalt 58.933	28 <b>Ni</b> Nickel 58.693	29 <b>Cu</b> Copper 63.546	30 <b>Zn</b> Zinc 65.38	31 <b>Ga</b> Gallium 69.723	32 <b>Ge</b> Germanium 72.631	33 <b>As</b> Arsenic 74.922	34 <b>Se</b> Selenium 78.971	35 <b>Br</b> Bromine 79.904	36 <b>Kr</b> Krypton 84.798	37 <b>Rb</b> Rubidium 85.468	38 <b>Sr</b> Strontium 87.62	39 <b>Y</b> Yttrium 88.906	40 <b>Zr</b> Zirconium 91.224	41 <b>Nb</b> Niobium 92.906	42 <b>Mo</b> Molybdenum 95.95	43 <b>Tc</b> Technetium 98.907	44 <b>Ru</b> Ruthenium 101.07	45 <b>Rh</b> Rhodium 102.906	46 <b>Pd</b> Palladium 106.42	47 <b>Ag</b> Silver 107.868	48 <b>Cd</b> Cadmium 112.414	49 <b>In</b> Indium 114.818	50 <b>Sn</b> Tin 118.711	51 <b>Sb</b> Antimony 121.760	52 <b>Te</b> Tellurium 127.6	53 <b>I</b> Iodine 126.904	54 <b>Xe</b> Xenon 131.294
55 <b>Cs</b> Cesium 132.905	56 <b>Ba</b> Barium 137.328	57 <b>La</b> Lanthanum 138.905	72 <b>Hf</b> Hafnium 178.49	73 <b>Ta</b> Tantalum 180.948	74 <b>W</b> Tungsten 183.84	75 <b>Re</b> Rhenium 186.207	76 <b>Os</b> Osmium 190.23	77 <b>Ir</b> Iridium 192.217	78 <b>Pt</b> Platinum 195.085	79 <b>Au</b> Gold 196.967	80 <b>Hg</b> Mercury 200.592	81 <b>Tl</b> Thallium 204.383	82 <b>Pb</b> Lead 207.2	83 <b>Bi</b> Bismuth 208.980	84 <b>Po</b> Polonium 208.982	85 <b>At</b> Astatine 209.987	86 <b>Rn</b> Radon 222.018	87 <b>Fr</b> Francium 223.020	88 <b>Ra</b> Radium 226.025	89 <b>Ac</b> Actinium 227.028															

Date: \_\_\_\_\_

2. Draw a stepped line to separate the metals from the non-metals and label each group.
3. Draw an arrow pointing to the stepped line and write the note, 'Metalloids can be found on both sides of this line.'

### Answer these questions:

1. Compare metals and non-metals in terms of:
  - a. Physical appearance, state, and material behaviour when you hammer it
  - b. Densities and melting points
  - c. Electrical and heat conduction
2. The number below the names of each element is called the atomic mass. Analyse the following statements and fill each blank with '**increases**' or '**decreases**' on the blank to make each statement correct.
  - a. The atomic mass \_\_\_\_\_ as you move down a group.
  - b. The atomic mass \_\_\_\_\_ by one as you move across a period.
  - c. The atomic mass \_\_\_\_\_ by one as you move down a group.
  - d. The atomic mass \_\_\_\_\_ as you move across a period.
3. Beryllium, magnesium, and calcium are the first three elements in Group 2. They make nitride when they all react with nitrogen. Given this information, what substance is created when strontium reacts with nitrogen? Explain.
4. What property classification is discussed in Question 3?
5. If the Boron's density is  $2.08 \text{ g/cm}^3$  and Aluminium's density is  $2.70 \text{ g/cm}^3$ , what could be the density of gallium? Explain.
6. What property classification is discussed in Question 4?
7. Dmitri Mendeleev made predictions about undiscovered elements. One of these is gallium which he originally called 'eka-aluminium'. What could be his reason for giving this undiscovered element this name? Look at the Periodic Table for a hint.