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., H₂O, CO₂)
- 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, metalloi 9. Color their own periodic table according which are n 10. Under each section put the characteristics of those di 11. Finally, explain that each square is a different element	netals, non-metals, ar visions.	nd metalloids.
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Periodic Table Teacher Notes

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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

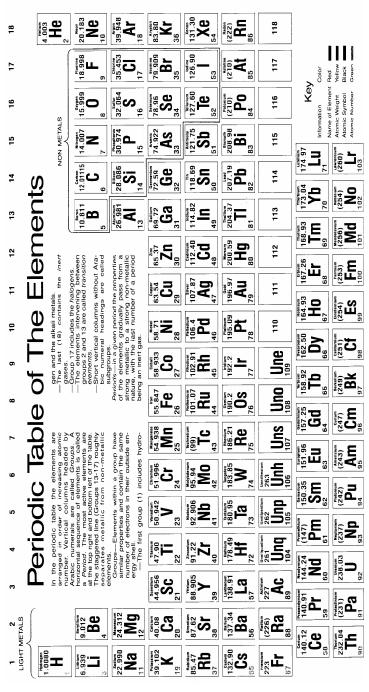
- ♦ Has properties of both metals and non-metals
- Found along the zigzag line.
- ♦ Can behave as a metal or a non-metal.



Periodic Table

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Student's Name: Date:



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