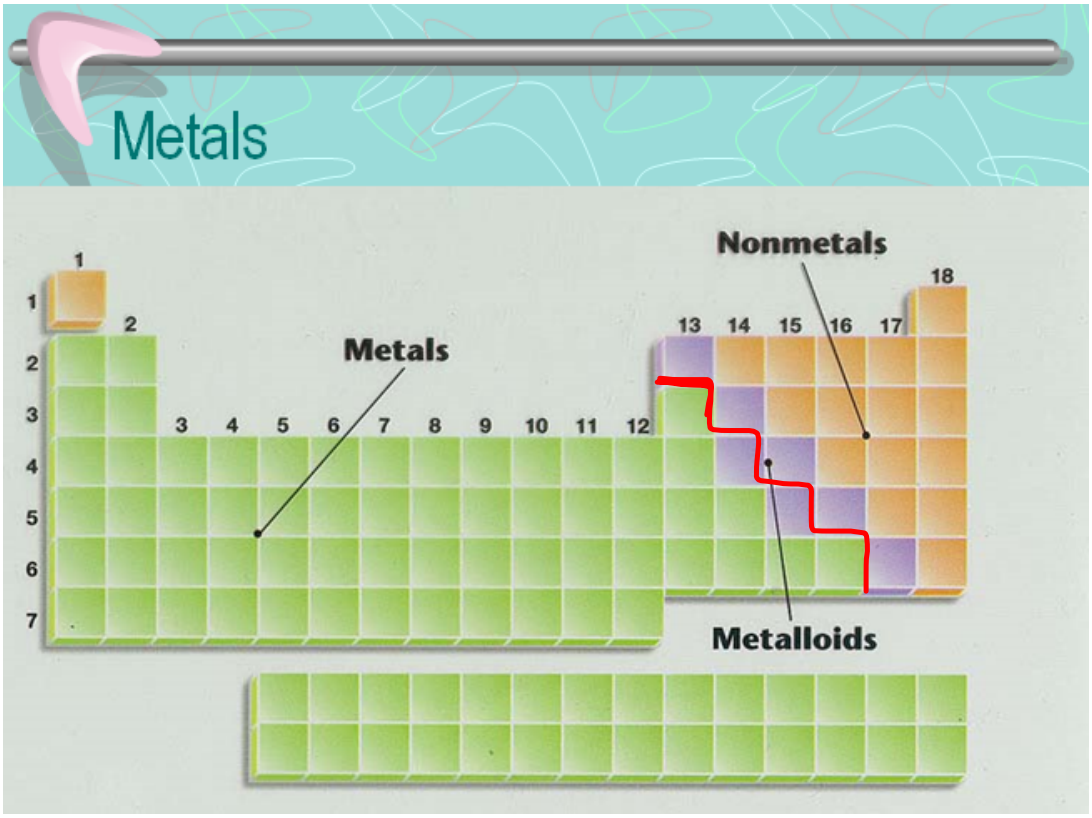
The Periodic Table

Please copy down underlined material only


Metals
Nonmetals
Metals
Metalloids
1
2
3
4
5
6
7
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

Chemical symbols and formulas (p. 58, 59).

Carbon

C

Iodine

I

A chemical symbol is an abbreviation of an element name. It is an international system. When a symbol only has one letter, it is a capital.

Chlorine

Cl

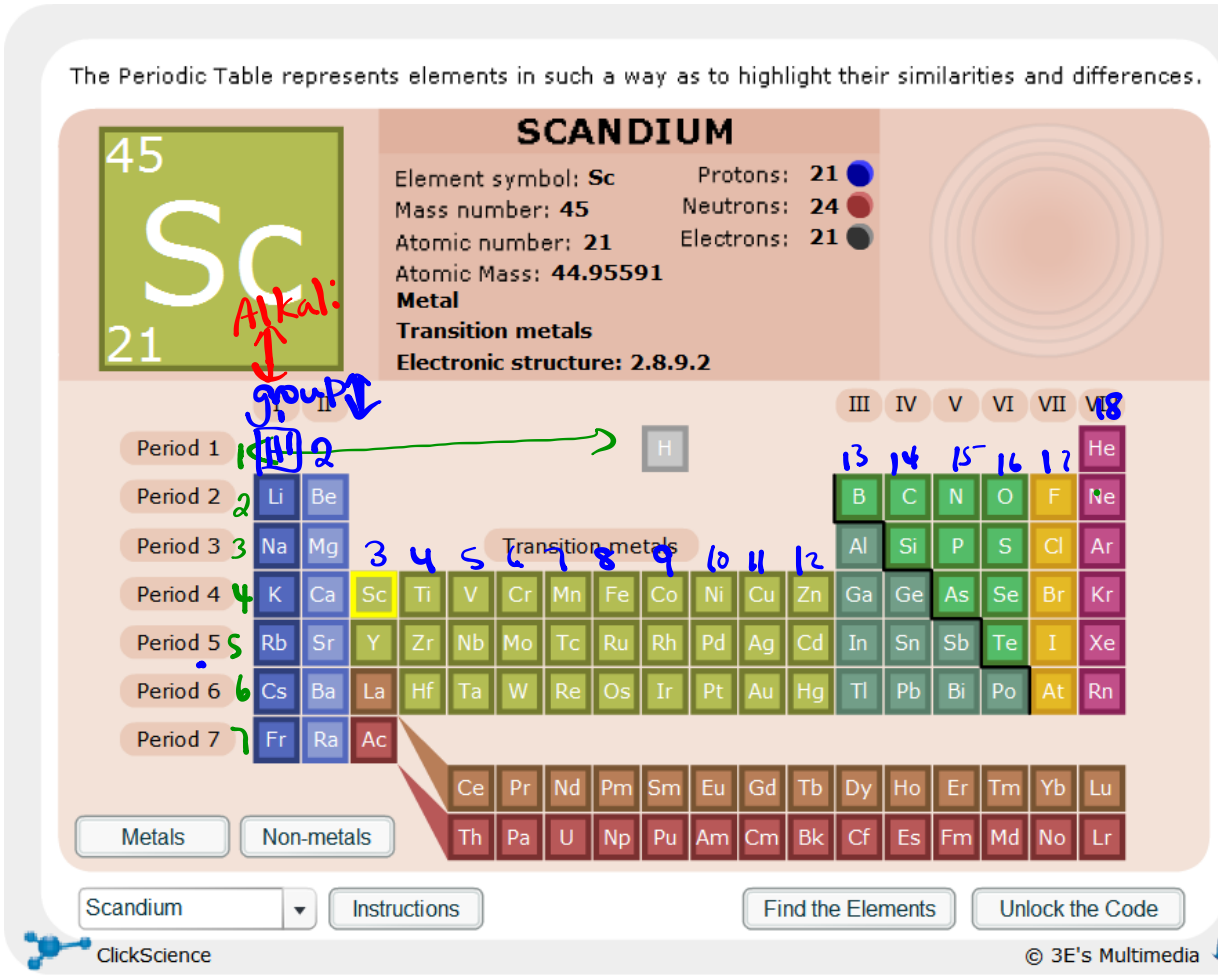
Gold

Au

(see table 1 page 58)

one - Cap. two one lower

Web Elements


The Periodic Table represents elements in such a way as to highlight their similarities and differences.
SCANDIUM
45
Sc
21
Element symbol: Sc
Mass number: 45
Atomic number: 21
Atomic Mass: 44.95591
Metal
Transition metals
Electronic structure: 2.8.9.2
Protons: 21
Neutrons: 24
Electrons: 21
Alkal.
group
Period 1
Period 2
Period 3
Period 4
Period 5
Period 6
Period 7
Transition metals
Metals
Non-metals
Scandium
Instructions
Find the Elements
Unlock the Code
ClickScience
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Why is the Periodic Table important to me?

- The periodic table is the most useful tool to a chemist.
- You get to use it on every test.
- It organizes lots of information about all the known elements.

Pre-Periodic Table Chemistry …

- It was a mess!!!
- No organization of elements.
- Imagine going to a grocery store with no organization!!
- Difficult to find information.
- Chemistry didn't make sense.

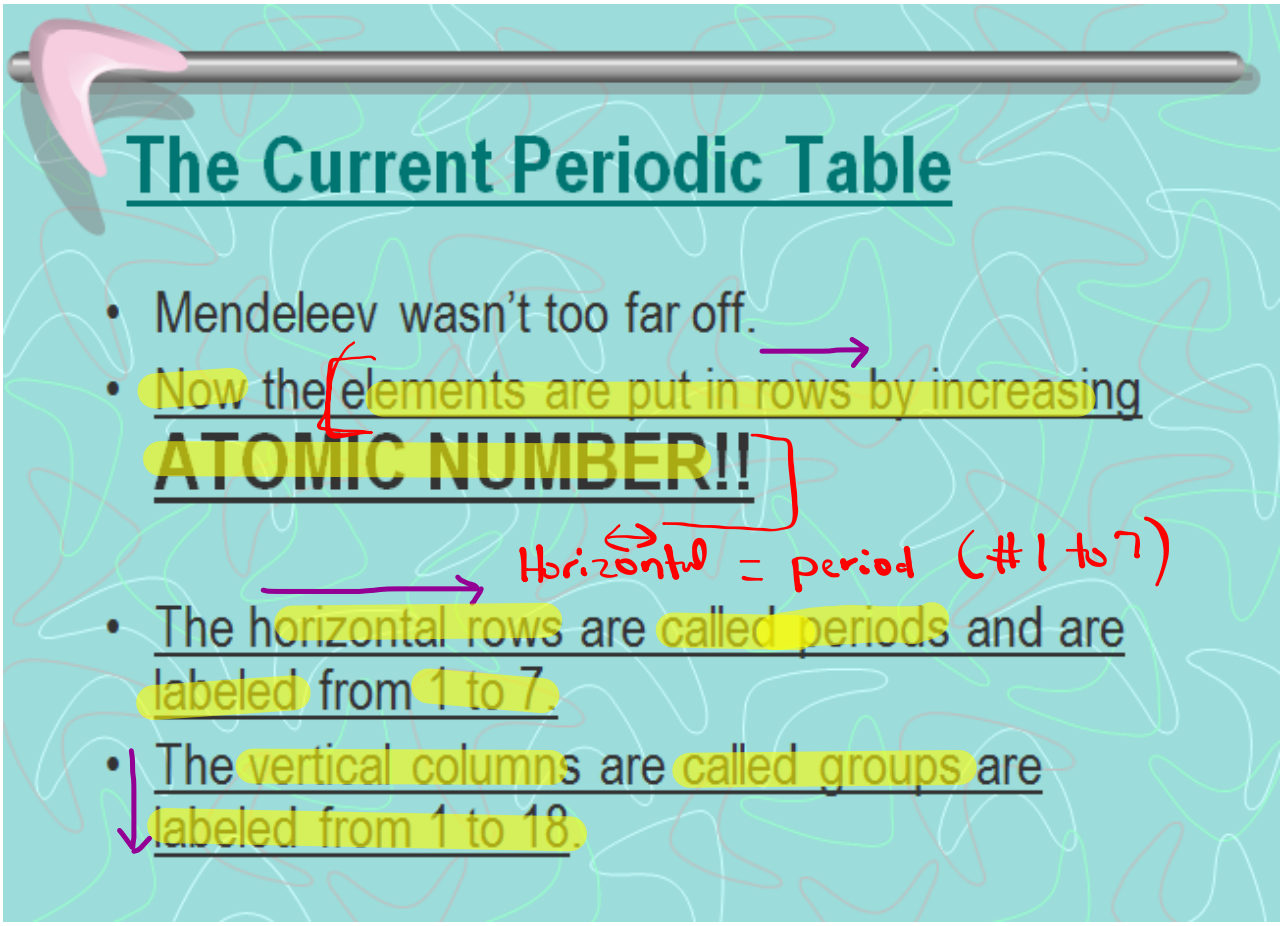
Dmitri Mendeleev: Father of the Table

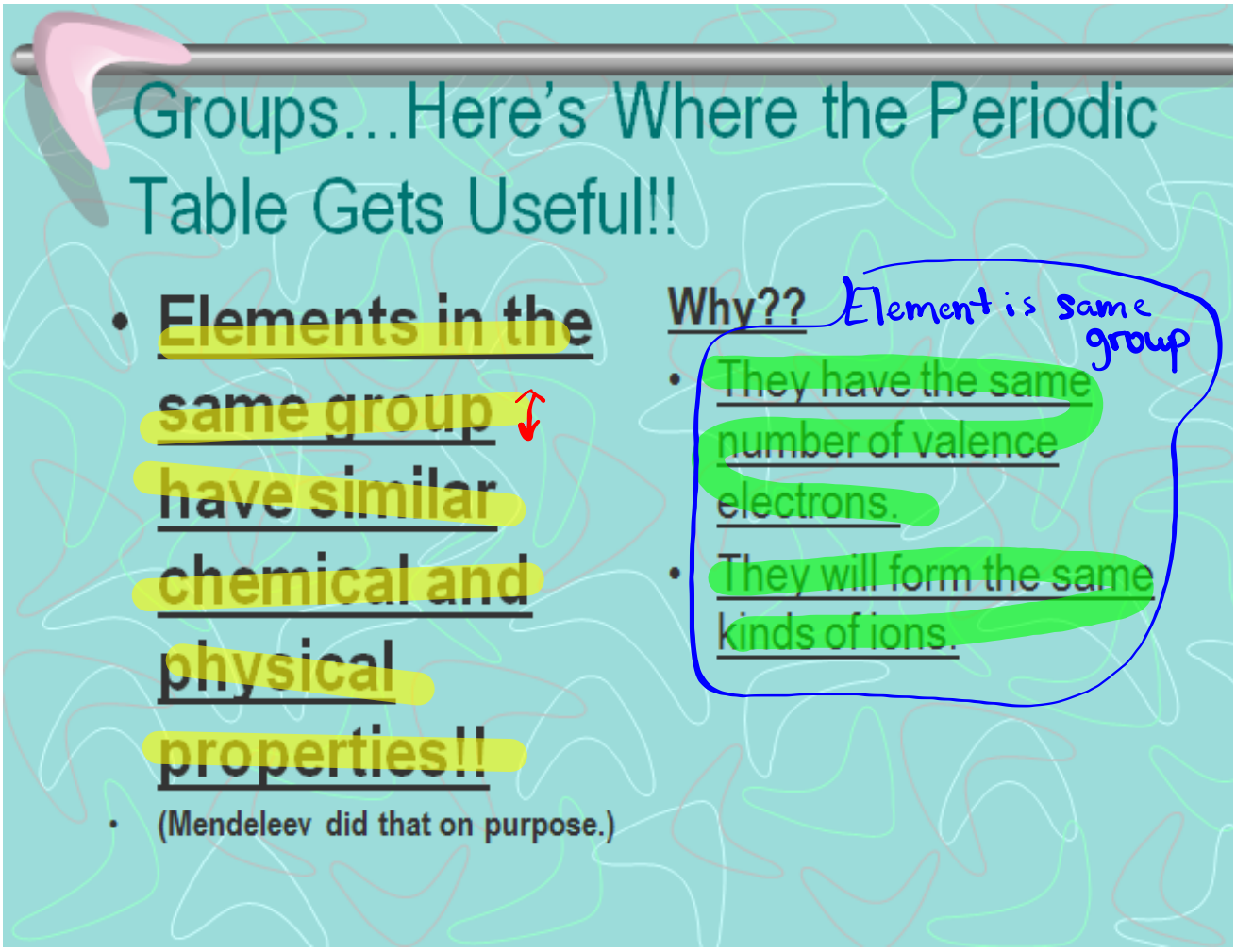
HOW HIS WORKED...

- Put elements in rows by increasing atomic weight.
- Put elements in columns by the way they reacted.

SOME PROBLEMS...

- He left blank spaces for what he said were undiscovered elements. (Turned out he was right!)
- He broke the pattern of increasing atomic weight to keep similar reacting elements together.

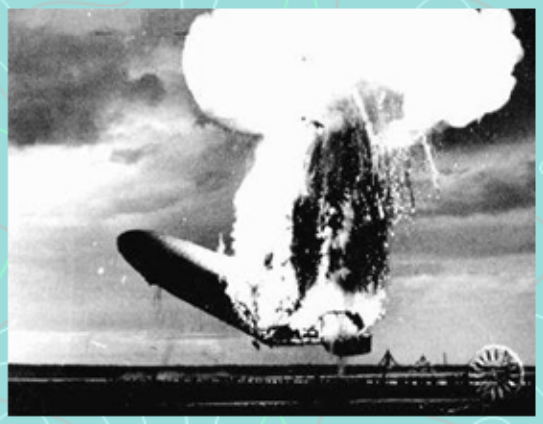

The Current Periodic Table
• Mendeleev wasn't too far off.
• Now the elements are put in rows by increasing ATOMIC NUMBER!!
Horizontal = period (#1 to 7)
• The horizontal rows are called periods and are labeled from 1 to 7.
• The vertical columns are called groups are labeled from 1 to 18.


Groups…Here's Where the Periodic Table Gets Useful!!
Elements in the same group have similar chemical and physical properties!!
(Mendeleev did that on purpose.)
Why??
Element is same group
They have the same number of valence electrons.
They will form the same kinds of ions.

Families on the Periodic Table

- **Columns are also grouped into families.**
- **Families may be one column, or several columns put together.**
- Families have names rather than numbers. (Just like your family has a common last name.)

Hydrogen Family



- Hydrogen belongs to a family of its own.
- Hydrogen is a diatomic, reactive gas.
- Hydrogen was involved in the explosion of the Hindenberg.
- Hydrogen is promising as an alternative fuel source for automobiles

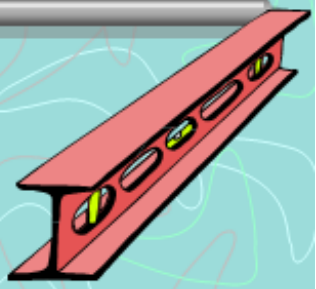
Alkali Metals

- 1st column on the periodic table (Group 1) not including hydrogen.
- Very reactive metals, always combined with something else in nature (like in salt).
- Soft enough to cut with a butter knife

Alkaline Earth Metals

- Second column on the periodic table. (Group 2)
- Reactive metals that are always combined with nonmetals in nature.
- Several of these elements are important mineral nutrients (such as Mg and Ca

Transition Metals



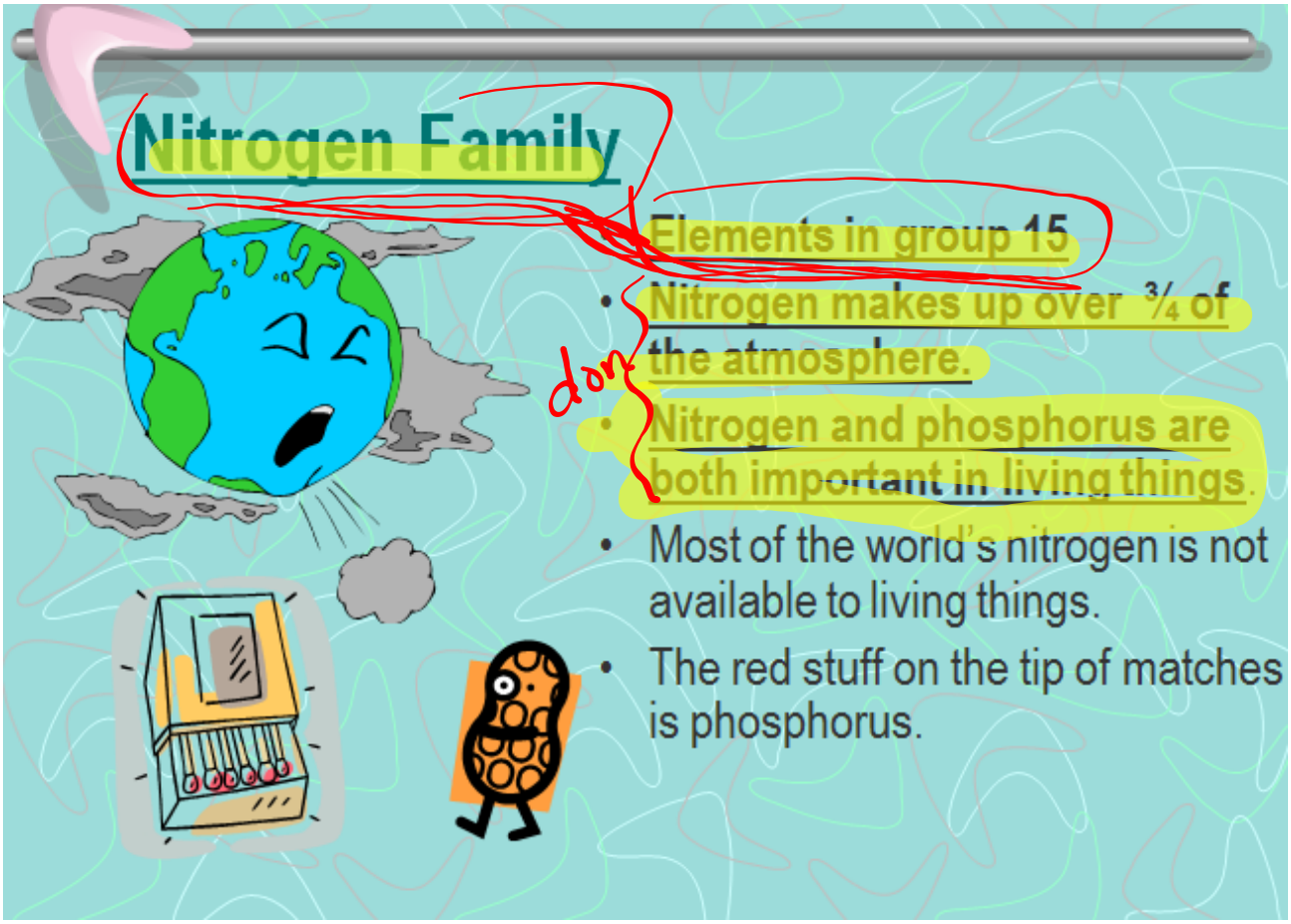
- Elements in groups 3-12
- Less reactive harder metals
- Includes metals used in jewelry and construction.
- Metals used "as metal."

Boron Family

- Elements in group 13
- Aluminum metal was once rare and expensive, not a "disposable metal."

Carbon Family

- **Elements in group 14**
- Contains elements important to life and computers.
- Carbon is the basis for an **entire branch** of chemistry.
- Silicon and Germanium are important semiconductors.


Nitrogen Family
Elements in group 15
Nitrogen makes up over ¾ of the atmosphere.
Nitrogen and phosphorus are both important in living things.
Most of the world's nitrogen is not available to living things.
The red stuff on the tip of matches is phosphorus.

Oxygen Family or Chalcogens

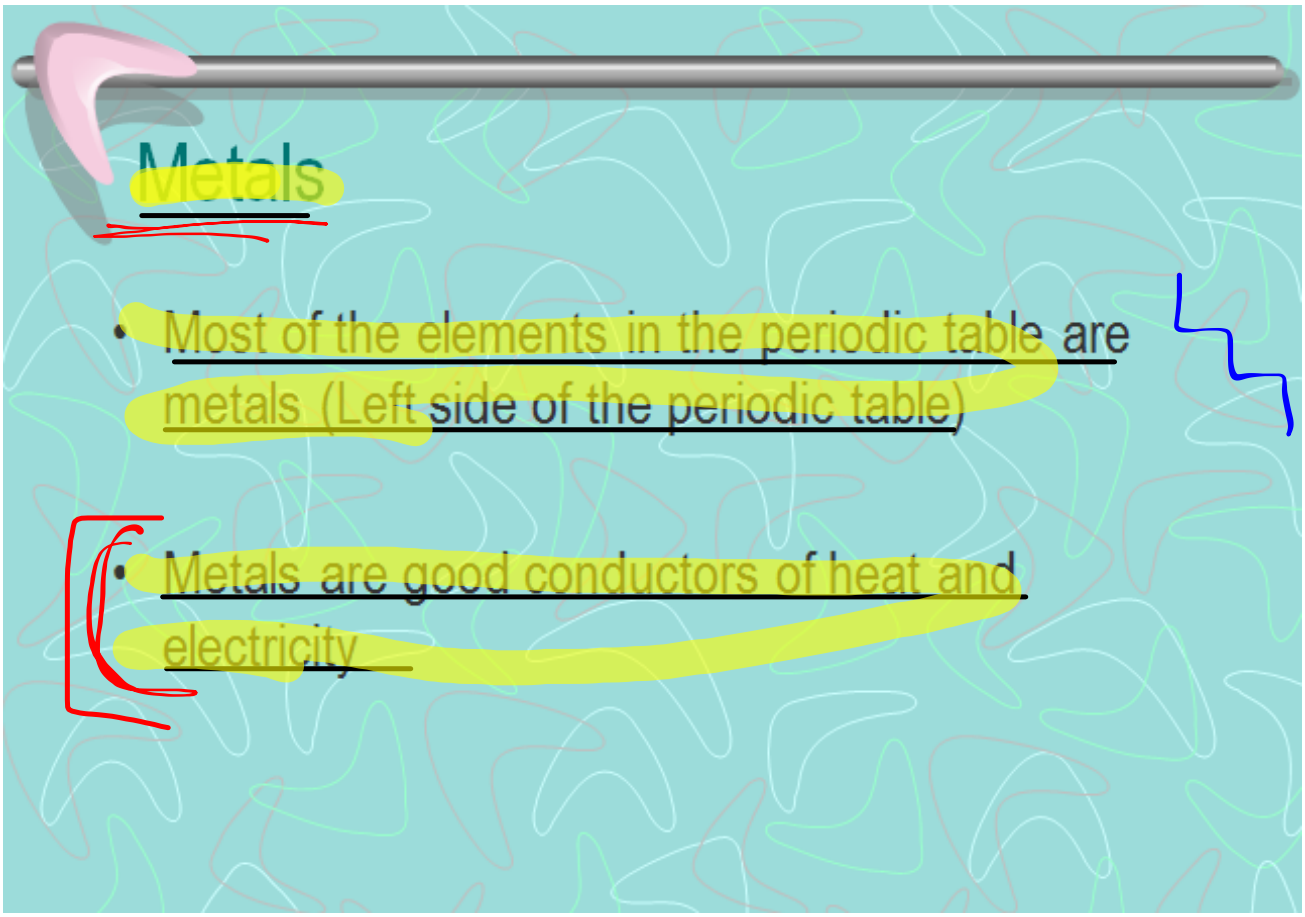
- Elements in group 16
- Oxygen is necessary for respiration.
- Many things that stink, contain sulfur (rotten eggs, garlic, skunks,etc.)

Halogens

- Elements in group 17
- Very reactive, volatile, diatomic, nonmetals
- Always found combined with other element in nature.
- Used as disinfectants and to strengthen teeth.

The Noble Gases

- Elements in group 18
- VERY unreactive, monatomic gases
- Used in lighted "neon" signs
- Used in blimps to fix the Hindenberg problem.
- Have a full valence shell.

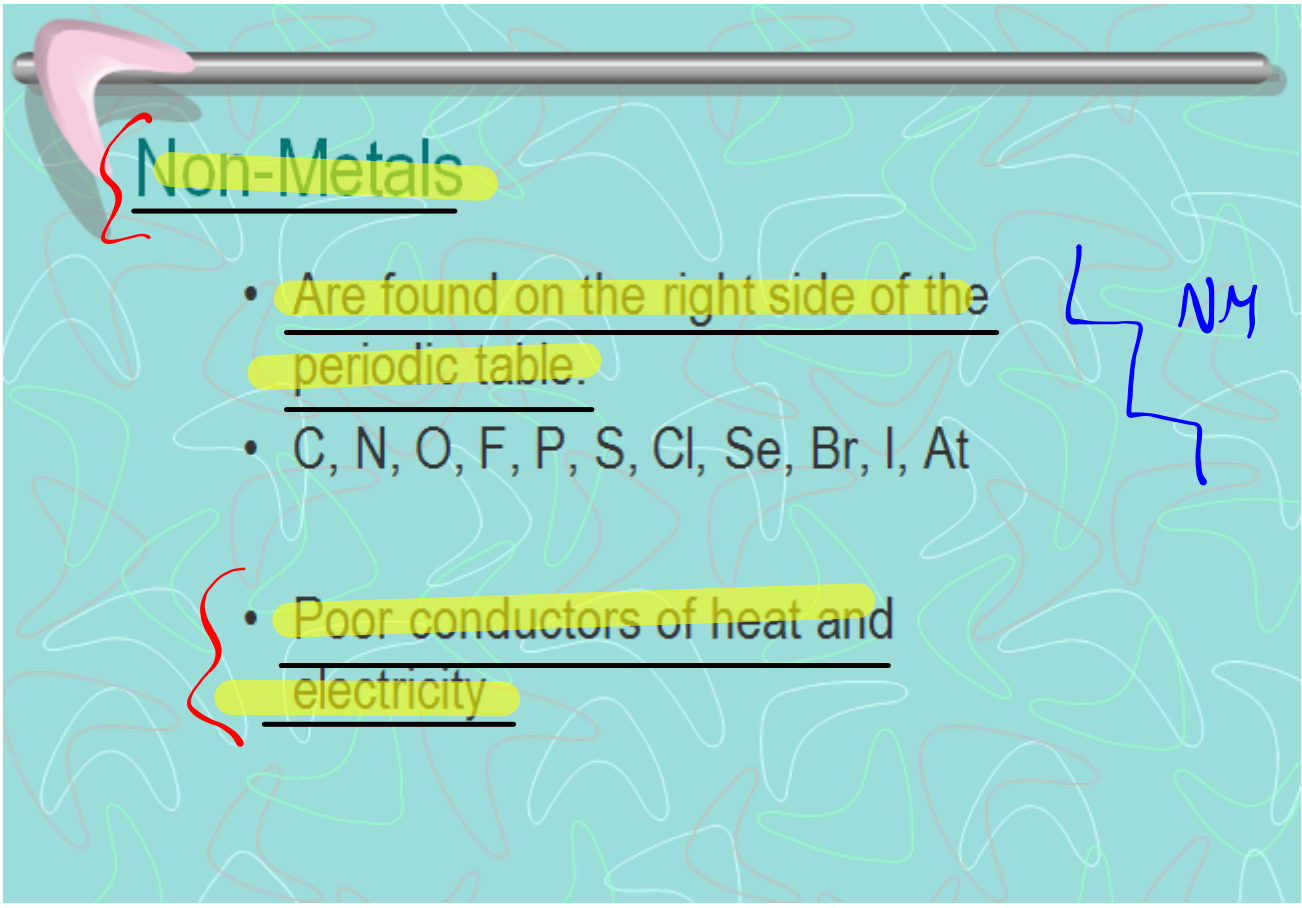

Metals
• Most of the elements in the periodic table are metals (Left side of the periodic table)
• Metals are good conductors of heat and electricity

Lanthanides:

Are a group of metals located on the second row from the bottom of the periodic table. They are fairly rare, their atomic numbers range from 57 (lanthanum) to 71 (lutetium). Some of these elements can be found in superconductors, glass production, or lasers.

Actinides:

Are a group of metals in the bottom row of the periodic table. The actinide family contains fifteen elements starting with actinium through the entire row to lawrencium. All actinides are radioactive and some are not found in nature.


Non-Metals
• Are found on the right side of the periodic table.
• C, N, O, F, P, S, Cl, Se, Br, I, At
• Poor conductors of heat and electricity
NM

Quiz on Thursday

- ✗ → particle theory 1, 2, 3, 4
- ✗ → Pure Substance
- ✗ → Solutions
- ✗ → Mixture
- ✗ → Homo / Hetero geneous Mixture
- ✗ → Elements, compounds, Atoms, molecules
- → Counting atoms
- ✗ → Label Periodic table with names of groups