Elements

Objectives:

Use a periodic table to name elements, given their symbols.

Use a periodic table to write the symbols of elements, given their names.

Describe the arrangement of the periodic table.

List the characteristics that distinguish metals, nonmetals, and metalloids.

Elements

- Definition: Pure substances that cannot be decomposed by chemical changes.
- Building blocks of matter.
- Grouped based on similar chemical properties.

Groups

Group→ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

- Each group has similar chemical properties.

Periods

↓Period

1

2

3

4

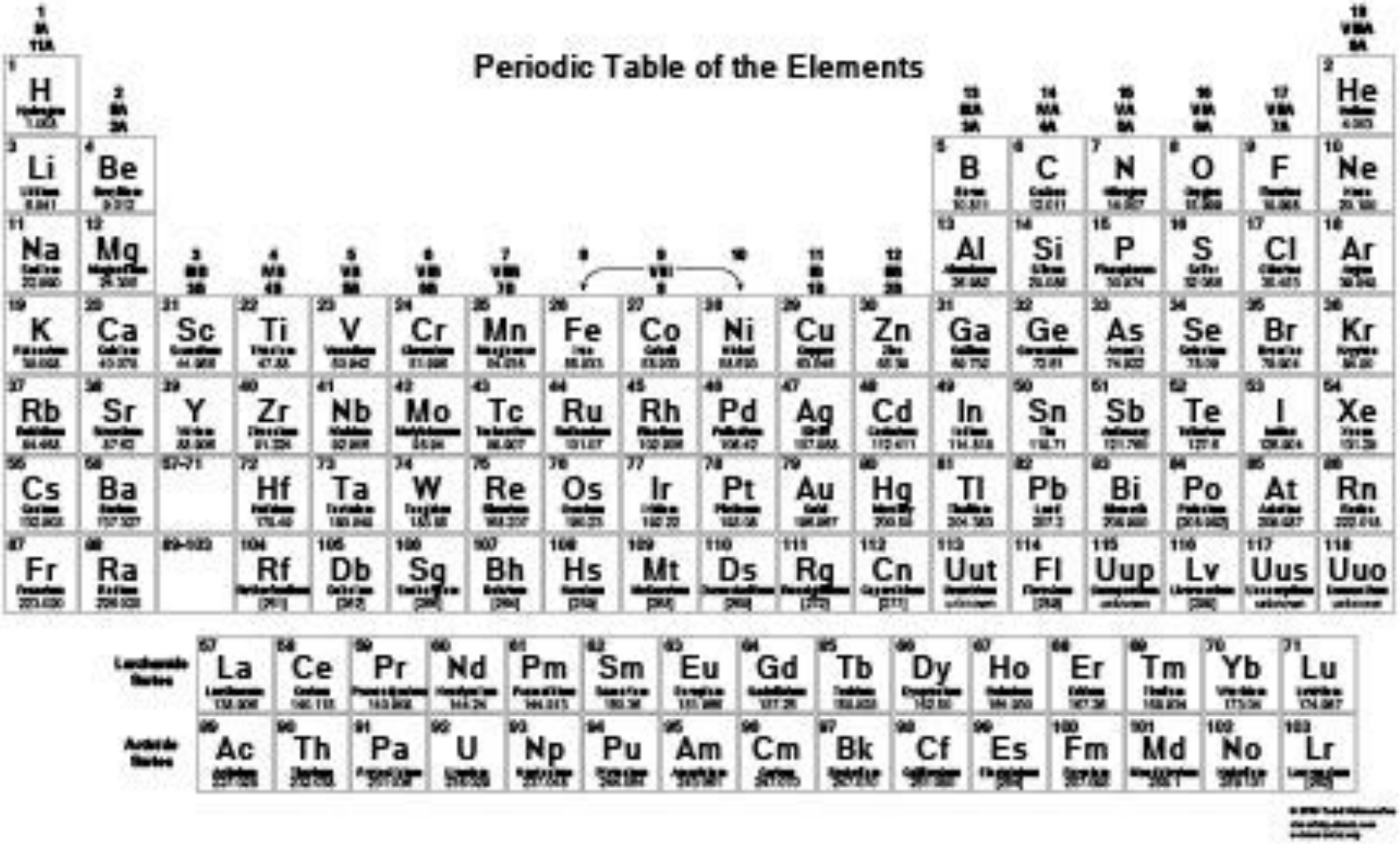
5

6

7

- Properties change widely throughout a period.
- Elements closer together will have similar properties rather than elements farther apart.

Periodic Table of the Elements



“Extra Rows”

Lanthanide Series

57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

Actinide Series

89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

- Placed below to keep the table from being too wide.

Types of Elements

- Metals
- Nonmetals
- Metalloids
- Noble Gases

Metals

- Definition:
  - an element that is a good electrical conductor and a good heat conductor.

- Characteristics:
  - Most are solids at room temperature
  - Malleability: physically changed into thin sheets
  - Ductile: formed into thin wire
  - Tensile Strength: resist breaking when pulled

Metals

- Exceptions:
  - Mercury is a liquid at room temperature
  - Tungsten has the highest melting point of any element
  - Metals in group 1 can be cut with a knife
  - Manganese are brittle
  - Most are grayish except gold and copper

Nonmetals

- Definition:
  - an element that is a poor of heat and electricity.

- Characteristics:
  - Most are gases at room temperature
  - Brittle: easily broken

Metalloids

- Definition:
  - an element that has characteristics of metals and nonmetals

- Characteristics:
  - Most are solids at room temperature
  - Malleability: less than metals
  - Brittle: less than nonmetals
  - Semiconductors of electricity

Noble Gases

- Definition:
  - an element that is a gas at room temperature

- Characteristics:
  - Most are gases at room temperature
  - Low reactivity