Chemistry **Name** _____
Periodic Law Activity **Date** _____

BACKGROUND INFORMATION: The present organization of the elements is a product of the first widely-accepted periodic table done by Dmitri Mendeleev in 1869. The amazing accuracy of his predictions has been very important to chemists in this century. However, the basis of his arrangement was the *atomic masses* of the elements. This approach proved *incorrect* as it would have placed some elements in a family with dissimilar properties. Henry Moseley rearranged the table on the basis of *atomic numbers* of the elements. In accordance with Moseley's revision, **the periodic law states: the properties of the elements are periodic functions of their atomic numbers.**

Each of the known elements has its own set of characteristic properties. These range from solid to gas, lustrous to dull, low to high melting points, various colors, and so on. The elements are arranged within the periodic table into groups or families (vertical columns) and periods (horizontal rows). This arrangement reflects the periodic or repeating nature of the properties of the elements.

OBJECTIVES: *In this experiment, you will*

- Arrange the elements in Groups I-VIII **(*not* transition or inner transition metals)** according to a list of clues and your knowledge of periodic properties.
- Predict the missing properties of each element based on location in the table.
- Explain the trends of properties in families and periods.

PROCEDURE:

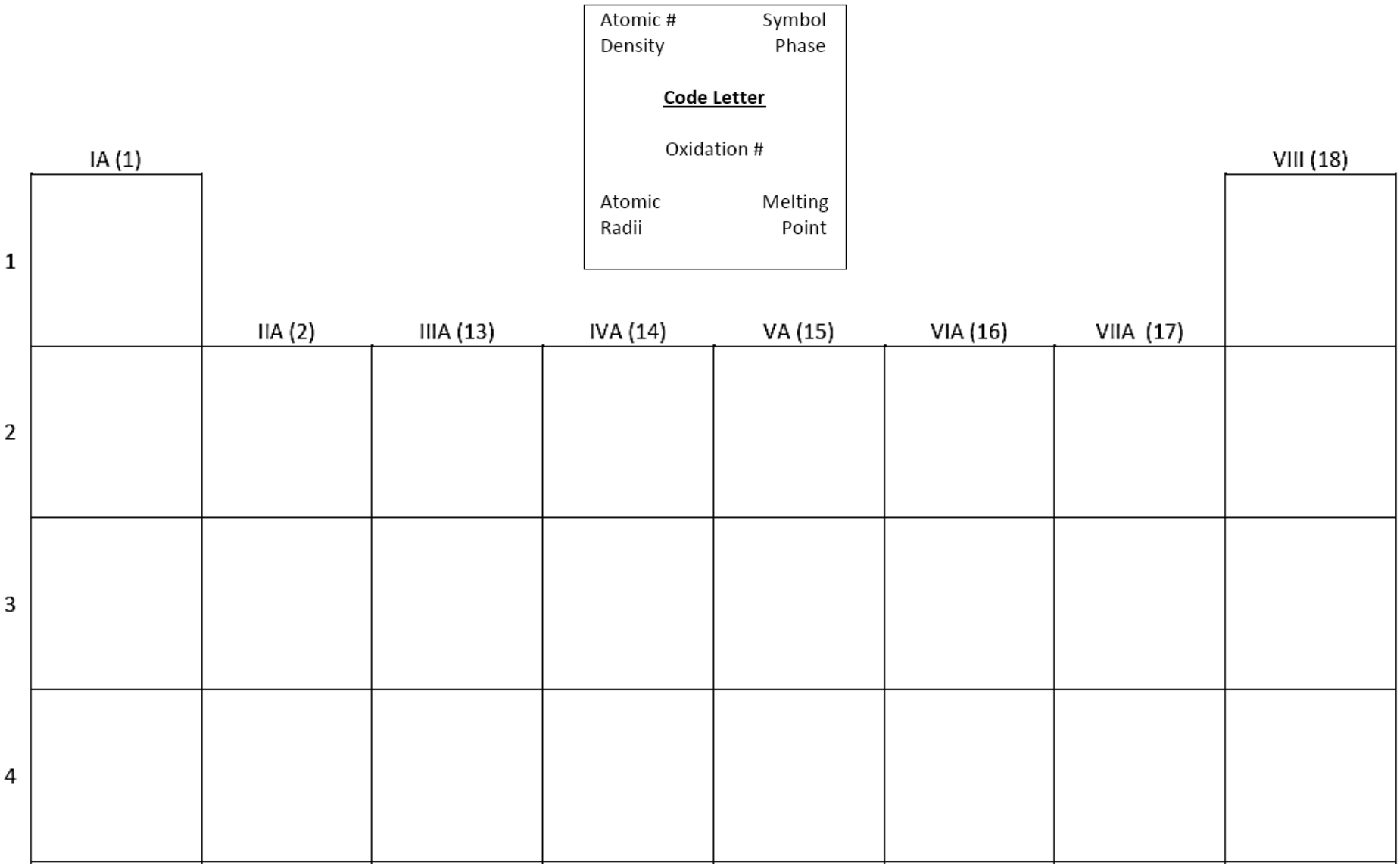
1. Locate your scrambled periodic table. Use the following clues and organize the elements in their proper order. Record this proper order on the blank periodic table given to you.

2. The following sets of elements belong together in *groups*:

ZRD, PSIF, JXBE, LHT, QKA, WOV, GUN, YMC

a. J has an atomic number three times that of T
b. U has a total of six electrons
c. I_2A is the simple formula of an oxide
d. P is less dense than S
e. S is an alkali metal
f. E is a noble gas
g. W is a liquid
h. Z has the smallest atomic mass in its group
i. B has ten protons
j. O has an atomic number larger than V
k. D has the largest atomic mass of its group
l. C has five electrons in its outer energy level
m. F is a gas
n. X has an atomic number one higher than F
o. L is an alkaline earth element with atomic mass of 40
p. Y is a metalloid
q. O is a halogen
r. The atomic mass of T is more than that of H
s. Q has an atomic mass 2 times that of A
t. Atoms of I are larger than those of S
u. M has an atomic number of one less than that of A
v. The electrons of atom N are distributed over three energy levels
w. The atomic radius of K is the largest of the group

3. Some information is missing from each block (element). Predict the values for the missing items from the location of the element on the periodic table. Write your predictions in each box of the blank periodic table.


Atomic # Symbol
Density Phase
Code Letter
Oxidation #
Atomic Radii
Melting Point
IA (1)
VIII (18)
IIA (2)
IIIA (13)
IVA (14)
VA (15)
VIA (16)
VIIA (17)
1
2
3
4