Science Exploratory Assessment
Name: _______________________
Period: _______________________ 

Standards:
Understand and apply knowledge of the structure and properties of matter.

SECTION 1: Density
1. James is walking home from school and he finds a small, rectangular, silver piece of a solid. He can’t identify what it is from just these observations. List the procedure (experiment) he could complete in order to identify the solid. Make sure you are specific in how you would find each measurement you need to find (i.e. mass).

2. Solve the following problems. Then using the calculated densities, identify each substance using the table provided.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>2.70 g/cm³</td>
</tr>
<tr>
<td>Zinc</td>
<td>6.90 g/cm³</td>
</tr>
<tr>
<td>Glass</td>
<td>2.60 g/cm³</td>
</tr>
<tr>
<td>Gold</td>
<td>19.30 g/cm³</td>
</tr>
</tbody>
</table>

a. Jamie has a solid with a mass of 50 grams and a volume of 2.59 cm³. Please calculate the density and identify the material using the table.

DENSITY=
IDENTITY=

b. Cindy has a solid with a volume of 14.49 cm³ and a mass of 100 grams. Please calculate the density and identify the material using the table.

DENSITY=
IDENTITY=
SECTION 2: Law of Conservation of Matter

3. Can matter be created or destroyed? Please answer yes or no and then site one piece of evidence from class that supports your answer.

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

SECTION 3: Phases of Matter

4. Draw 3 examples of matter (solid, liquid, gas) explain what particle models demonstrate.

5. Explain why an ice cube will float in water and sink in rubbing alcohol.
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

SECTION 4: Classification of Matter and Phase Changes

6. Rain exhibits what type of phase change? This change is from a _____________ to a _________________.
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

7. Compare and contrast heterogeneous and homogeneous mixtures. Give an example of each one.


8. Compare and contrast atom and molecule.


SECTION 5: Physical and Chemical Changes and Properties

9.

<table>
<thead>
<tr>
<th>VOCABULARY WORD</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Property</td>
<td></td>
</tr>
<tr>
<td>Physical Change</td>
<td></td>
</tr>
<tr>
<td>Chemical Property</td>
<td></td>
</tr>
<tr>
<td>Chemical Change</td>
<td></td>
</tr>
</tbody>
</table>

10. Identify the following as either a chemical (c) or physical (p) change.
   a. Broken glass ________
   b. cutting grass ________
   c. fireworks exploding ________

11. Complete the table.

<table>
<thead>
<tr>
<th>Part of the Atom</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proton</td>
<td>Negative</td>
</tr>
<tr>
<td></td>
<td>No charge</td>
</tr>
</tbody>
</table>
12. The atomic number on the periodic table tells you what information about the atom of a certain element?

13. If an element has an atomic mass of 23 amu and has 11 protons. How many neutrons does an atom of this element have?

14. The nucleus of the atom is made of and

15. Complete the table. Fill in the missing information.

<table>
<thead>
<tr>
<th>Element</th>
<th>Protons</th>
<th>Neutrons</th>
<th>Electrons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>6</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Magnesium</td>
<td>8</td>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

16. The energy required to remove electrons from a gaseous atom or ion is called what?

17. The tendency to want 8 electrons and if atoms do not have this electron configuration they bond with other atoms to get this configuration is called?

18. Define a covalent and ionic bond.
   a. Covalent Bond_____________________________________________________
   b. Ionic Bond_______________________________________________________
19. Another name for electrons in the outer shell is ____________________

20. Horizontal rows on the periodic table are called ________________

21. Vertical columns on the periodic table are called ________________

22-23. Draw the electron Bohr diagram for the following elements. Please redraw next to the question.

   a. Na

   b. P

24. What is an isotope? — Circle the correct answer.
   a. Different atoms of the same element but with a different number of neutrons and the same number of protons.
   b. Different atoms of the same element but with the same number of neutrons and the same number of protons.
   c. Different atoms of the same element but with the same number of neutrons and a different number of protons.

25. The atomic number tells you? — Circle the correct answer
   a. Number of protons and electrons
   b. Number of neutrons
   c. Number of protons and neutrons

26. How do you find the number of neutrons? — Circle the correct answer
   a. Atomic number
   b. Atomic mass- atomic number
   c. Atomic number – mass number
27. Fill in the tables below.

<table>
<thead>
<tr>
<th></th>
<th>Oxygen</th>
<th>Neon</th>
</tr>
</thead>
<tbody>
<tr>
<td># of protons</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of neutrons</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of electrons</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

28. Sodium-24 has a half-life of 15 hours. How much sodium-24 will remain in an 18.0 g sample after 60 hours?

Identify the following reactions in the blank following the reaction. Word Bank: combustion, single displacement, double displacement, synthesis, decomposition

30. Zn $+ S_8 \rightarrow ZnS$ ______________________

31. $C_{12}H_{22}O_{11} + O_2 \rightarrow CO_2 + H_2O$ ______________________

32. $Fe + O_2 \rightarrow Fe_2O_3$ ______________________

33. $AgF + CaCl_2 \rightarrow AgCl + CaF_2$ ______________________

34. $NaBr + H_3PO_4 \rightarrow Na_3PO_4 + HBr$ ______________________

35. $Na + Cl_2 \rightarrow NaCl$ ______________________