### Atoms and Their Composition

Elements are the basic substances that make up all ____________.

An atom is the smallest particle of an element that still retains the ___________ and ___________ of the element.

Atoms are made up of even smaller particles. These ___________ particles are ___________ and ___________.

Protons and neutrons make up the ___________ or core of an atom and contribute to the ___________ of an atom, while electrons are ___________ and occupy the ___________ that surround the nucleus of the atom (__________). Electrons are so ___________ and ___________ that they essentially contribute no overall weight to the atom.

<table>
<thead>
<tr>
<th>Subatomic Particle</th>
<th>Charge</th>
<th>Symbol</th>
<th>Mass (g)</th>
<th>Radius (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electron</td>
<td></td>
<td></td>
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<tr>
<td>Proton</td>
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<td></td>
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<tr>
<td>Neutron</td>
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</tbody>
</table>

Since subatomic particles are so light, chemists use a unit called an _____________ for their measurement. Both protons and neutrons have a mass of _____.

Every Element has a unique:
- Name
- Symbol
- Atomic number (Z)
- Atomic Mass (A)
2. Decomposition

A decomposition reaction is the reverse to a synthesis reaction, a compound ______________ into ______________ or other ______________.

The general equation for a decomposition reaction is:  \[ C \rightarrow A + B \]

Example:

Typically, some form of ______________ or type of ______________ is needed to initiate a decomposition reaction.

A catalyst is a substance that controls the ______________ of a reaction, without being ______________ during the reaction or affecting the overall ______________.

How do you know that a single displacement reaction can occur or do they always occur?

For example, explain why the two above reactions occur but the following reaction does not?

In order to determine if an element will displace another element in a single displacement reaction you must refer to an ______________.

If one element is ______ another element in the compound, it can be ______ ______ and a single displacement reaction will occur.

Non-metals, typically ______ are involved in Single Displacement Reactions. To determine who can bump out whom, you must refer to the ______________ ______________.

Predict if the following reactions will occur and what the products are:

Fluorine                 Chlorine  I
2   +  NaCl  \rightarrow \_____________________________

Bromine                Iodine  F
2   +  KBr  \rightarrow \_____________________________

3. Single Displacement Reaction

A single Displacement reaction occurs when one _______ in a compound is ______________ by another _______. This can occur in 2 ways, a _____ can replace a _______ or a _______ can replace a _______.

The general equation for a single displacement reaction is:

Examples: