Name: _____

1. The production of _____ and change of _____ are signs of _____. (p148)

2. _____ is a substance that undergoes a chemical change.

3. _____ is a substance that is the result of a chemical change.

4. Chemical reactions _____ atoms.

5. New _____ atoms are not created and, and old _____ atoms are not destroyed. Atoms are rearranged as _____ are broken and _____. In all chemical reactions, mass is always conserved, i.e. _____ before a chemical reactions equals the _____ after the chemical reaction.

6. Energy must be added to _____ bonds. Forming bonds _____ energy.

7. Energy is conserved in a chemical reaction, meaning that total _____ before a chemical reaction must equal the total _____ after a chemical reaction. It will feel _____ to touch.

8. Reactions that release energy are called _____ reactions. The _____ will rise in the surrounding area.

9. Reactions that absorb energy are _____ reactions. The temperature will _____ in the surrounding area. It will feel _____ to touch.

10. In a general chemical reaction equation template,

    _____ → _____

Endothermic Reaction Lab

Objective: _____
_____
_____

Materials:

1. _____
2. _____
3. _____
4. Digital Thermometer/computer
5. _____
6. Table Spoon
7. Goggles

Hypothesis:

Chemical Formulas:

Baking Soda, Sodium Bicarbonate, $NaHCO_3$,
Vinegar, Acetic Acid, CH_3COOH, gives sour taste

Chemical Reaction Formula
1. $NaHCO_3 + CH_3COOH \rightarrow CH_3COONa + H_2CO_3$ (Carbonic Acid)
2. $H_2CO_3 \rightarrow H_2O$ and CO_2 (bubbling)

Procedure:
1. Pour 10 ml of _____ into plastic bag
2. Start Pasco Passport (watch teacher)
3. Place thermometer into bag and select "start"
4. Record Temperature: _____ ^oC
5. With thermometer in bag add 1 spoon full of baking soda
6. Observe temperature vs. time graph. Select "stop" after about 20 seconds or so.
7. Record final temperature _____ ^oC
8. Describe the feel of the bag: _____
9. Print-out graph. Write-out title "Endothermic Reaction" and attach to this report sheet.
10. Pour content of bag into the sink. Place plastic bag on counter near the sink.

Post-Lab Questions
1. Was you hypothesis correct? _____

2. Describe what an endothermic reaction is. _____
   _____
   _____

3. What were the reactants of your experiment? _____
   _____

4. What were the 3-final products of your experiment?

   a. _____
   b. _____
   c. _____