**Unit 3 – Chemical Reactions Review Assignment**

**Instructions**: Use the class website ([**www.nsdscience.weebly.com**](http://www.nsdscience.weebly.com)) and any other online resource to complete the following questions and prompts. Use complete sentences for all solutions and answers. Do NOT copy and paste material as your written answers. You may copy/paste images and graphs to support your explanations and descriptions. Show all equations, and work (including units) for any math problem.

1. **Learning Target 3.1** – Identify physical vs. chemical changes.
   1. Create a Venn diagram or a table showing similarities and differences for physical and chemical changes.
   2. Identify the following changes as either physical or chemical. Include an explanation for your choice.
      1. Cutting paper.
      2. Burning paper.
      3. Rusting metal.
      4. Melting an ice cube.
      5. Cutting your hair.
      6. Cooking an egg.
2. **Learning Target 3.2** – Be able to read, write, and balance a simple chemical equation according to the Law of Conservation of Mass.
   1. What does the Law of Conservation of Mass state with respect to chemical reactions?
   2. In the following Chemical Equation highlight the subscripts in green and the coefficients in red.
      1. 2 Al2O3 🡪 4 Al + 3 O2
      2. How many atoms of Aluminum are present on each side?
      3. How many molecules of Aluminum Oxide are present on the reactant side?
      4. How many molecules of Oxygen are present on the product side?
   3. Balance the following chemical equations using coefficients.
      1. Digital Practice found at - https://education.jlab.org/elementbalancing/
      2. \_\_\_\_SnO2 + \_\_\_\_\_ H2 🡪 \_\_\_\_\_Sn + \_\_\_\_\_H2O
      3. \_\_\_\_Na + \_\_\_\_\_ Cl2 🡪 \_\_\_\_\_NaCl
   4. Complete and balance the following chemical equations.
      1. (single replacement reaction) \_\_\_Zn + \_\_\_\_\_HCl 🡪
      2. (synthesis reaction) \_\_\_\_K + \_\_\_\_\_Br2 🡪
3. **Learning Target 3.3** – Describe five options for controlling chemical reaction rates.
   1. What does the term reaction rate refer to?
   2. Name four ways to increase the rate of a chemical reaction. Include an explanation of how/why.
   3. Name four ways to decrease the rate of a chemical reaction. Include an explanation of how/why.
4. **Learning Target 3.4** – Classify/Identify various types of chemical reactions (exothermic, endothermic, single-replacement, double-replacement, decomposition, synthesis)
   1. What is the difference between an exothermic reaction and an endothermic reaction?
   2. Identify the type of reaction for the following (generic and specific) chemical equations.
      1. A + BC 🡪 B + AC
      2. P + O2 🡪 P4O10
      3. AB + CD 🡪 AD + BC
      4. KClO3 🡪 KCl + O2
      5. A + B 🡪 AB
      6. HgO + Cl2 🡪 HgCl + O2
      7. AB 🡪 A + B
      8. CuCl2 + H2S 🡪 CuS + HCl
   3. Online practice for identifying types of reactions: <https://tinyurl.com/bxezv2v>
      1. Note: combustion reactions always have carbon dioxide and water as products.
5. **Vocabulary Review**: https://quizlet.com/\_617rkf
6. Practice Quiz: **https://tinyurl.com/yazum8qf**