Chapter 3 and 4 Review Questions **Name: _____**

Chapter 3 Review: Different Forms of Energy

1. What is solar energy? Give an example

2. What is thermal energy? Give an example

3. What is energy transfer? Give two examples

4. What is energy transformation? Give two examples

5. Explain why the total amount of energy in a system always remains constant.

6. What is the formula to find energy efficiency?

7. Why are most substances not 100% efficient?

8. To perform 1200 J of useful energy, a machine consumes 20 000 KJ. What is the energy efficiency of this machine?

9. An electric lawn mower consumes 30 000 J of energy in order provide 12 500 J of useful energy. What is its percent efficiency?

10. A kettle that is 85% efficient provides 16 700 J of useful energy. How much energy does it consume?

11. An electric razor that is 56% efficient consumes 5 800 J of energy. How much useful energy does it provide?

12. What is the difference between heat and temperature?

Chapter 4 Review: Changes in Matter

1. What is a physical change? Provide two examples.

2. What is a chemical change? Provide two examples.

3. What is a nuclear transformation? Provide an example.

4. What signs point to the occurrence of a chemical change? List 5.

5. What is the law of conservation of mass?

6. What is acid-base neutralization?

7. What is oxidation?

8. What is combustion?

9. What is cellular respiration?

10. What is photosynthesis?

11. To learn how to control fires, firefighters have to study the three necessary conditions for a fire to start. What are these conditions?

12. What is the difference between an oxidizing agent and a fuel? Give an example of each.

13. What is the law of conservation of mass?

14. If 12 grams of water react with salt (NaCL) to create 3 grams of HCl and 20 grams of NaOH, how much salt was needed?

15. In a chemical reaction, 6 grams of oxygen gas is produced along with 12 grams of hydrogen gas. How much water was needed to make these amounts?

16. The neutralization of 24.5 g of sulphuric acid (H_2SO_4) requires 42 g of sodium bicarbonate ($NaHCO_3$). This neutralization reaction produces 35.5 g of sodium sulphate Na_2SO_4), 22 g of carbon dioxide (CO_2) and a certain amount of water (H2O).
    The balanced equation for this reaction is:

    $H_2SO_4 + 2\ NaHCO_3 \rightarrow Na_2SO_4 + 2CO_2 + 2H_20$

    What is the mass of the water produced during this neutralization reaction?

17. Balance the following equations:

    a) $Mg + O_2 \rightarrow MgO$

    b) $Fe + O_2 \rightarrow Fe_2O_3$

    c) $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$

    d) $KOH + H_2SO_4 \rightarrow K_2SO_4 + H_20$