Grade 10 Science Midyear Review Answers can be found at: http://msjadah.weebly.com

Chapter One: Atoms and Elements

The Atom and The History of the Atom

1. Draw an atom and label the following parts: electron, proton, shell, neutron, and nucleus.
2. What charge do protons have? What charge do electrons have?
3. What are the names of the two philosophers who first came up with the concept of the atom?
4. Explain Dalton's theory of the atomic model
5. Explain Thomson's theory of the atomic model
6. Explain Rutherford's theory of the atomic model
7. Explain Bohr's theory of the atomic model (also referred to as the Rutherford-Bohr model)
8. What did Chadwick add to the atomic model (also referred to as the Simplified Atomic model)

Periodic Table

9. Fill in the following table on the location of the following:

	Location on Periodic Table
Metals	
Non-Metals	
Metalloids	
Alkali Metals	
Alkaline Earth Metals	
Halogens	
Noble Gases	

10. Which element is in the 2^{nd} period and 4^{th} group?
11. Which element is in the 4^{th} period and 7^{th} group?
12. How can we tell how many valence electrons an atom has?
13. Draw Magnesium in Lewis Notation
14. Draw the Rutherford-Bohr model of Oxygen

Chapter Two: Molecules and Solutions

Ions

15. What is the difference between an atom and a molecule? Give an example of each.
16. What is the difference between an atom and an ion?
17. Why would an atom want to gain or lose electrons?
18. Do atoms ever gain or lose protons?
19. Does a positive ion gain or lose electrons?
20. Does a negative ion gain or lose electrons?
21. How many protons and electrons does N^{-3} have?
22. What is the symbol for Calcium as an ion?
23. What is the symbol for Nitrogen as an ion?

Solutions and Concentration

24. What is an aqueous solution?
25. Fruit juices, body fluids and cleaning solutions for contact lenses are all examples of aqueous solutions. What is the solvent in these solutions?
26. A solution has a volume of 2L and a concentration of 15 g/L, what is the mass of the solution?
27. You are given a 7 L solution that has 2500 ml of sugar dissolved in it. What is the % (v/v) concentration of the solution?
28. A 200 ml glass of sugar-water contains 0.4 g of sugar. What is the percent of concentration?
29. A solution has a concentration of 15.5 g/L and a mass of 35.65 g.
    a) What is the volume of this solution?
    b) What is the ppm of this solution?
30. A 30 L sample of river water has 12 g of contaminant in it. What is the PPM concentration of the pond water?

Electrolytes

31. An apple has a pH value of 3 and a carrot has a pH value of 5. Which of these food items is more acidic?
32. What colors do blue and red litmus paper turn when put into an acid?
33. State whether the following are acids, bases or salts:

	Acid, Base or Salt?		Acid, Base, or Neutral?
KOH		Solution with a pH of 6	
HNO_3		Solution with a pH of 13.9	
H_2SO_3		Solution with a pH of 2	
NaCl:		Solution with a pH of 7	

Chapter 3: Different Forms of Energy

34. Explain why the total amount of energy in a system always remains constant.
35. What is the formula to find energy efficiency?
36. Why are most substances not 100% efficient?
37. To perform 1200 J of useful energy, a machine consumes 20 000 KJ. What is the energy efficiency of this machine?
38. An electric lawn mower consumes 30 000 J of energy in order provide 12 500 J of useful energy. What is its percent efficiency?
39. What is the difference between heat and temperature?

Chapter 4: Changes in Matter

40. What is a physical change? Provide two examples.
41. What is a chemical change? Provide two examples.
42. What signs point to the occurrence of a chemical change? List 5.
43. What is the law of conservation of mass?
44. What is acid-base neutralization?

45. What is oxidation?
46. What is combustion?
47. What is cellular respiration?
48. What is photosynthesis?
49. To learn how to control fires, firefighters have to study the three necessary conditions for a fire to start. What are these conditions?
50. 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?
51. 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?

52. Balance the following equations:

    a) $Mg + O_2 \rightarrow MgO$

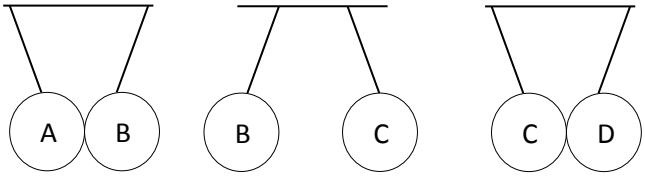
    b) $Fe + O_2 \rightarrow Fe_2O_3$

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

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

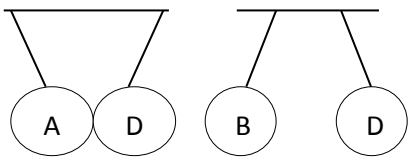
<u>Chapter 5: Electricity</u>

53. Complete the following statements:
    - Like charges _____ .
    - Opposite charges _____ .
54. The following experiment is set up using charged spheres.

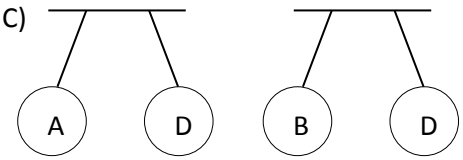


Spheres A and D are then set up side by side, as well as spheres B & D. Which diagram below correctly shows what would happen?

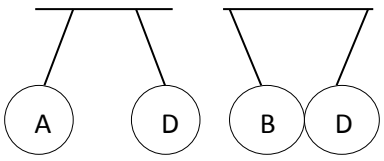
A)



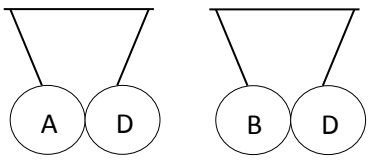
C)



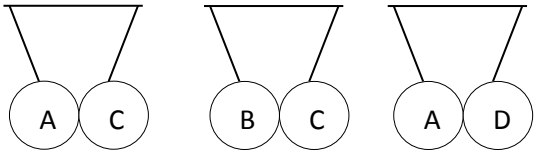
B)



D)

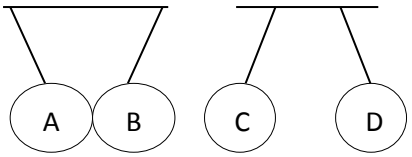


55. The following experiment is set up using charged spheres.

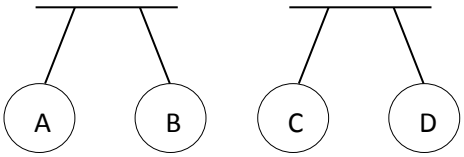


Spheres A & B are then set up side by side, as well as spheres C & D. Which diagram below correctly shows what would happen?

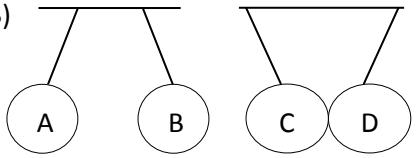
A)



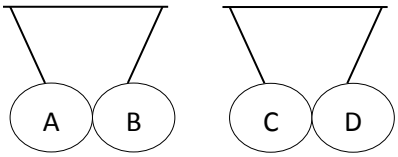
C)



B)



D)



TENDENCY	SUBSTANCE
Acquire a Negative Charge	Rubber
	Ebonite
	Polyethylene (Plastic)
	Cotton
	Silk
	Wool
	Glass
	Acetate
Acquire a Positive Charge	Fur

56. What charges will ebonite and wool acquire if they are rubbed together?
57. What charges will wool and glass each acquire if they are rubbed together?
58. Explain why your hair sticks up after pulling off a wool hat in the winter.

Ohm's Law

59. Find the applied voltage of a circuit that draws 0.2 amperes through a 4800-ohm resistance.
60. A 20-volt relay has a coil resistance of 200 ohms. How much current does it draw?
61. Find the resistance of a circuit that draws 0.06 amperes with 12 volts applied.