Science 10 Unit 1 Worksheet

Chapter 3, Part 1.

1. A _____ can build up in your body when you walk across a carpet.

2. A device that detects static electricity is called an _____.

3. Charged objects brought near an electroscope either _____ or _____ the ball.

4. The two possible types of electrical charge are called _____ and _____. An object that has no electrical charge at all is called _____.

5. Describe the two rules of static electricity:

Part 2.

6. Matter is made up of tiny particles called _____ and static electricity is due to the _____ of the atom..

7. The smaller particles that make up the structure of an atom are called _____.

8. The negatively charged particle of an atom are called _____.

9. Sketch a simple diagram of typical atom:

10. The scientist _____ discovered subatomic particles which led to the invention of the modern day _____.

11. The Nucleus is the _____ central part of the atom and is _____ charged.

12. Rutherford discovered that the nucleus was made up of tiny _____.

13. A proton's charge is _____ of an electron, the _____ of the charge is the same.

14. Protons are about _____ times more massive than electron.

15. Neutral atoms contain _____ numbers of protons and _____.

16. Describe what happens when neutral atoms are rubbed together:

17. Only _____ are transferred by rubbing since they are _____.

18. Atoms of the same _____ have the same number of _____ in their nuclei.

19. The number of protons in the nucleus of an element is called the _____.

20. A change in the number of protons of an element result in a different _____ being formed. This requires a very large amount of energy such as is found in a _____.

21. The movement of electrons within _____ towards a positively charged object is called an _____. The neutral object does not _____ or _____ electrons.

22. In close surroundings, a neutral ball is _____ to a positively charged rod.

23. Briefly explain who was Earnest Rutherford?

24. The unit used to measure the amount of static electricity present is called the _____.

25. The amount of charge present may be either _____ or _____ and is equal to the charge of _____ protons/electron.

Part 3.

26. Stored energy is called _____.

27. Rubbing two neutral objects together and separating electrons from protons_____ the electrical potential energy of the objects.

28. A _____ uses the potential energy of chemicals to make a difference in electrical potential between the two electrical _____. As a result of chemical action electrons are _____ to one terminal and _____ from the other terminal.

29. _____ is the amount of electrical potential energy transferred by a charged object.

30. A device which measures the voltage of a cell is called a _____.

31. Two or more chemical cells connected in a _____ is called a _____.

32. Cells may be connected in two different ways. In a _____, the positive terminal of one cell is connected to the _____ terminal of another. By contrast, in a _____ the positive terminals of all the cells are connected and so are the _____ terminals.

33. Electron in a cell will flow from the _____ terminal to the _____ terminal. Until all the chemicals in the cell run out of _____.

34. What is the difference between Conventional current and what we know about real electricity?

35. Electrical currents may flow in _____ and _____. Current can happen as a result of both positive an negatively charged particles moving in the same _____.

36. The amount of electrical current is measured in _____.

37. An ampere is a current of _____ of electric charge per _____. The electric current flowing in a wire is measured by an instrument called an _____.

38. _____ are materials that easily allow electrons to pass through. Groups of materials in which electrons do not move easily are called _____.

39. An _____ is a complete pathway for an electric current. _____ are often used to represent electric circuits and their components.

40. Describe some of the differences between series and parallel circuits:

41. What is electrical resistance?

42. Devices like cooking elements, light bulbs, water heater elements are made of materials which offer resistance to the flow of current in a circuit and are referred to as _____.

43. A _____ is a type of variable resistor which allows current to be increase or decreased in a circuit. Examples of these include: _____

44. Resistance in a circuit is measured in _____ and is represented by the Greek symbol _____.

45. The _____ coloured bands around a resistor indicate its _____ .

46. Current through any material is _____ to the _____ and is called _____.

47. Write the equations for Ohm's Law and describe what each variable stands for:

48. Using the examples given on the bottom of page 61, solve the following problems:

A) An electric heater runs on 120 V power from a house plug. When it is in use, 15 A flow through it. What is the resistance of the heating element inside the heater?

B) Darth Vader's light saber has a resistance of 40 Ohms. To slice off an opponent's limb it needs a current of 6 Amps to pass through it. What voltage is necessary to make it work?

C) A coffee maker running off a 120V house plug has a resistance of 8 Ohms in its heating element. What current is in the heating element?

Chapter 4, Part 4.

49. An object which exerts a force or pull on a piece of iron is called a _____.

50. English scientist Michael Faraday invented the idea of a _____.

51. Magnetic poles are the regions of a magnet where the magnetic field is the _____ and these _____ are located at both ends of the _____. Magnets will either _____ or _____ one another.

52. A suspended magnet will turn so that one pole points to the _____ and one to the _____.

53. Magnetic fields may be drawn by lines called _____. These lines are _____ and _____ at the poles of a magnet.

54. Where the earth's magnet fields are most concentrated are called the _____.

55. The positions of these poles are not the same as the earth's _____ north & south poles.

56. Briefly explain the difference between magnetic and true north:

Part 5.

57. Materials affected by a magnetic field are called _____.

58. Only _____ are strongly magnetic. These are _____.

59. What causes various elements to be magnetic?

60. Atoms of magnetic elements arrange themselves in groups called _____.

61. What causes iron to act like a temporary magnet?

62. It is hard to change the position of the magnetic domains in _____ .

63. Are permanent magnets really permanent? How may they be changed?

64. Read figure 4.10 on page 71. Compare the difference between diagram A and B.

Part 6.

65. Why was Professor Hans Oersted's discovery about electromagnetism so important?

66. Read the Activity 4D on page 72 & 73.

67. _____ developed a rule of electromagnetism called the _____ rule.

68. Briefly describe the rule mentioned in question #67:

69. Briefly describe the diagram found in figure 4.18 on page 75:

70. Magnets that make magnetic fields while electricity flows through them are called _____.

71. How do electromagnets work?

72. Describe some of practical uses of electromagnets:

Part 6.

73. Scientists _____ and _____ worked independently to produce similar methods of making _____ with electric fields. Essentially they made the first type of _____. A special ammeter called a _____ uses a _____ needle so that it can measure very small electric currents travelling in either _____.

74. An electric generator is any device that can change _____ into _____ energy.

75. Up until the early 1800s, electricity was mostly made by _____ which were _____ and only produced _____of power.

76. Generators make power by moving a _____ through a _____ or by _____ the magnetic field around a _____. This process _____ a force on the _____ in the conductor and pushes the electrons through it.

77. Generators may be improved by _____ a magnet near _____ of wire resulting in an improved and smoother charging of the _____.

78. In a bike generator, _____are used instead of permanent magnets. To create a part called an _____ which spins inside electromagnetic coils.

79. As a magnet is placed inside a wire coil, the current flows in _____ direction. When it is removed, the current then flows in the _____ direction.

80. When current flows in changing directions it is called _____ or _____ for short.
81. How many times each second does household electricity change direction? _____

82. In order to observe these cycles one must use an _____.

83. Direct _____ or _____is electricity that only flows in _____. This type of current is produced by _____.

84. AC is _____ to DC and is used on electronic appliances such as _____.

85. Read figures 4.33 and also 4.34. Sketch the different results observed on an oscilloscope. Compare these observations and give an explanation for each.

86. Describe the two ways in which a many generators may be used:

87. What is the difference between a generator and an electrical motor?