

Name: _____

Date: _____

AP Biology Summer Assignment (203 total points)

Unit 1 Chemistry of Life

Summer assignment will be due and collected on the first day of class. Late assignments will not be accepted except in cases of serious, documented illness or other hardship beyond the student's control. It is the responsibility of the student to plan for the on-time submission of all work now and in the future for this course.

Part 1: Required Reading Assignment (exam 1st week of school)

Read the following in your book (pages in the red text below). You will be responsible for knowing the content of this material and there will be a multiple choice exam on this material the first week of the semester.

Chapter 2: The Chemical Context of Life

- 2.1 Matter consists of chemical elements in pure form and combinations called compounds **page 29 to 30**
- 2.2 An elements properties depend on the structure of its atom **page 30 to 35**
- 2.3 The formation and function of molecules depend on chemical bonding between atoms **page 36 to 40**
- 2.4 Chemical reactions make and break chemical bonds **page 40 to 41**

Chapter 3: Water and Life

- 3.1 Polar covalent bonds in water molecules result in hydrogen bonding **page 45**
- 3.2 Four emergent properties of water contribute to Earth's suitability for life **page 45 to 50**
- 3.3 Acidic and basic conditions affect living organisms **page 51 to 53**

Chapter 4: Carbon and the Molecular Diversity of Life

- 4.2 Carbon atoms can form diverse molecules by bonding to four other atoms **page 58 to 62**
- 4.3 A few chemical groups are key to molecular function **page 62 to 64**

Chapter 5: The Structure and Function of Large Biological Molecules

- 5.1 Macromolecules are polymers, built from monomers **page 66 to 68**
- 5.2 Carbohydrates serve as fuel and building block material **page 68 to 72**
- 5.3 Lipids are a diverse group of hydrophobic molecules **page 72 to 75**
- 5.4 Proteins include a diversity of structures, resulting in a wide range of functions **page 75 to 83**
- 5.5 Nucleic acids store, transmit, and help express heredity information **page 84 to 87**

Name: _____

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Part 2: Vocabulary (107 points)

Using the main text of your book and/or the glossary in the back of your book, define the words below by writing out the definitions. This assignment must be completed handwritten, neat, and legible. Typed response will result in a zero. **Definitions must come from your textbook only.** Definitions from the internet or other outside sources will be considered plagiarism and result in a zero on all of part 2.

Chapter 2: The Chemical Context of Life

1. matter:

2. element:

3. compound:

4. essential elements:

Name: _____

Date: _____

5. trace elements:

6. atoms:

7. neutrons:

8. protons:

9. electrons:

Name: _____

Date: _____

10. atomic nucleus:

11. atomic number:

12. mass number:

13. isotopes:

14. radioactive isotope:

Name: _____

Date: _____

15. half-life:

16. radioactive dating:

17. energy:

18. potential energy:

19. valence electrons:

Name: _____

Date: _____

20. valence shell:

21. orbital:

22. chemical bonds:

23. covalent bonds:

24. single bond:

Name: _____

Date: _____

25. double bond:

26. electronegativity:

27. nonpolar covalent bonds:

28. polar covalent bonds:

29. ionic bonds:

Name: _____

Date: _____

30. hydrogen bonds:

31. Van der Waals interactions:

32. chemical reaction:

33. reactants:

34. products:

Name: _____

Date: _____

35. chemical equilibrium:

Chapter 3: Water and Life

36. polar covalent bond:

37. polar molecule:

38. hydrogen bonds:

39. cohesion:

Name: _____

Date: _____

40. adhesion:

41. specific heat:

42. hydrophilic:

43. hydrophobic:

44. acid:

Name: _____

Date: _____

45. base:

46. carbonic acid (H_2CO_3) :

47. pH:

48. buffers:

Chapter 4: Carbon and the Molecular Diversity of Life

49. valence:

Name: _____

Date: _____

50. hydrocarbons:

51. isomers:

52. structural isomers:

53. cis-trans isomers:

54. enantiomers:

Name: _____

Date: _____

55. functional groups:

56. adenosine triphosphate (ATP):

Chapter 5: The Structure and Function of Large Biological Molecules

57. macromolecules:

58. polymer:

59. monomer:

Name: _____

Date: _____

60. enzymes:

61. dehydration reaction:

62. hydrolysis:

63. carbohydrates:

64. monosaccharides:

Name: _____

Date: _____

65. disaccharides:

66. glycosidic linkage:

67. polysaccharides:

68. starch:

69. glycogen:

Name: _____

Date: _____

70. cellulose:

71. chitin:

72. lipids:

73. fat:

74. fatty acid:

Name: _____

Date: _____

75. triacylglycerol:

76. saturated fatty acids:

77. unsaturated fatty acids:

78. trans fat:

79. phospholipid:

Name: _____

Date: _____

80. steroids:

81. cholesterol:

82. catalysts:

83. polypeptide:

84. protein:

Name: _____

Date: _____

85. peptide bond:

86. primary structure:

87. secondary structure:

88. α helix:

89. β pleated sheet:

Name: _____

Date: _____

90. tertiary structure:

91. hydrophobic interaction:

92. disulfide bridges:

93. quaternary structure:

94. sickle-cell disease:

Name: _____

Date: _____

95. denaturation:

96. x-ray crystallography:

97. gene:

98. nucleic acid:

99. deoxyribonucleic acid (DNA) :

Name: _____

Date: _____

100. ribonucleic acid (RNA):

101. gene expression:

102. polynucleotides:

103. nucleotides:

104. deoxyribose:

Name: _____

Date: _____

105. ribose:

106. double-helix:

107. antiparallel:

Name: _____

Date: _____

Part 3: Concept Check Questions (96 points)

Answer the following questions on separate sheets of paper. **Your name and date must be on the upper right hand corner of all pages submitted.** This assignment must be completed handwritten and must be neat and legible. Typed response will result in a zero. Answers must be in full and complete sentences. Academic dishonesty (cheating, plagiarism, etc.) will result in a zero and be accompanied with disciplinary measures.

Chapter 2: The Chemical Context of Life

Concept Check 2.1 (page 30) Questions 1, 2, 3, 4

Concept Check 2.2 (page 36) Questions 1, 2, 3, 4

Concept Check 2.3 (page 40) Questions 1, 2, 3

Concept Check 2.4 (page 41) Questions 1, 2, 3

Chapter 3: Water and Life

Concept Check 3.1 (page 45) Questions 1, 2, 3, 4

Concept Check 3.2 (page 50) Questions 1, 2, 3, 4, 5

Concept Check 3.3 (page 53) Questions 1, 2, 3, 4

Chapter 4: Carbon and the Molecular Diversity of Life

Concept Check 4.2 (page 62) Questions 1, 2, 3, 4

Concept Check 4.3 (page 64) Questions 1, 2, 3

Chapter 5: The Structure and Function of Large Biological Molecules

Concept Check 5.1 (page 68) Questions 1, 2, 3

Concept Check 5.2 (page 72) Questions 1, 2, 3

Concept Check 5.3 (page 75) Questions 1, 2, 3

Concept Check 5.4 (page 83) Questions 1, 2, 3

Concept Check 5.5 (page 86) Questions 1, 2