Chemistry 11/12

Course Description

Chemistry Eleven/Twelve is the study of matter, its composition, and its changes. Chemistry Eleven/Twelve builds on the foundation of chemical concepts developed in CATS seven through CATS ten. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. (Noncredit course: 45 lect/pres hrs, 45 lab hrs, 45 other hrs)

Text and References

Approved county texts and supplements

Course Goals

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives (Addendum A). (*designates a CRUCIAL goal)

1.*	(6)	use SI units C11
2.		describe basic chemical properties
3.*		write chemical element/compound symbols C21
4.*	(6)	convert metric units
5.*	(2)	define Avogadro's number C36
6.		analyze data relationships
7.	(6)	apply dependent/ independent variables C14
8.*	(6)	calculate formula/molar mass
9.	(6)	analyze quantitative data C10
10.*	(6)	calculate mole conversions
11.	(6)	calculate limiting reactant C42
12.	(6)	calculate percent yield
13.	(2)	describe basic physical changes C21
14.	(2)	describe basic physical properties
15.*	(6)	write balanced chemical formulae C21
16.*	(2)	describe periodic table metals /metalloids position
17.*	(6)	describe periodic table nonmetal positions C21
18.	(51)	describe reaction types
19.	(6)	describe the activity series CTC 28
20.	(6)	predict metal reactivities
21.*	(6)	write balanced chemical equations C21
22.	(2)	describe basic chemical changes
23.	(51)	describe covalent bonding C31
24.	(51)	describe ionic bonding
25.	(51)	describe electronegativity 30
26.	(2)	define principle quantum [n,l,m,s] numbers C27
27.	(2)	define electron energy levels C25
28.	(2)	define electron energy sublevels
29.	(39)	describe Einstein's contributionsC22
30.	(39)	describe Schrödinger contributions
31.	(39)	list deBroglie's contributions C22
32.		conduct experiments
33.	(32)	conduct open-ended experiments C16
34.	(32)	conduct decomposition/ electrolysis reactions

35. (32) prepare science lab and project presentations C16
36. (39) use correct grammar
37. (32) use cbl, or computer probe data C 74
38. (32) use safe laboratory procedures
39. demonstrate ethical reporting practices C6
40. (39) research science and technology occupational opportunities
41. (79) make model/data based conclusions C16
42. (2) describe water's polar molecular nature
43. (2) describe water's properties CTC22
44. (39) research chemistry related environmental problems
45. (6) draw models CTC32
46. (39) research technology related social impact problems
47. (6) calculate percent compositionCTC26
48. (32) measure percent composition
49. (6) calculate empirical formulae C37
50. (2) name strong and weak acids
51. describe acids C48
52. (3) write correct acid names
53. (32) measure pH C52
54. (2) distinguish between binary and oxyacids
55.* (6) solve factor-label unit conversions C10
56. (6) calculate stoichiometric mass/volume problems
57. (32) measure reaction products C39
58. (6) predict electronegativities
59. (51) describe sigma bondsC33
60. (51) describe pi bonds
61. (6) predict bonding types C31
62. (6) describe periodic trends
63. (3) write electron dot formulae C29
64. (3) write electron configurations
65.* (6) calculate molarity C37
66. (6) calculate molality
67. (6) calculate pH/pOH values C52
68. (3) design experiments
69. (6) solve Boyle's law problems C40
70. (6) solve Charles' law problems
71. (6) solve Gay-Lussac's Law problems C40
72. (6) solve combined gas law problems
73. (6) calculate ideal gas law C41
74. (6) use established standard equations
75. (6) calculate enthalpy
76. (6) predict water/acidic - water/basic anhydride products
77. (6) calculate heat of reaction
78. (79) describe organic functional groups
79. construct molecular models C32
80. (51) describe kinetic molecular theory
81. (51) describe LeChatlier's principle C46
82. (32) determine reaction rates
83. (2) define oxidation and reductionC54
84. (6) write redox electron transfer
85. (6) write redox half-reactions C55
86. (51) describe entropy
87. (6) calculate Gibb's free energyC58
88. (6) write balanced net ionic equations
89. (6) calculate equilibrium constant C47
90. (6) calculate ionization constant

91. (6) calculate solubility product constants C51
92. (51) describe alpha radiation
93. (2) describe beta radiationCTC39
94. (2) describe gamma radiation

ADDENDUM A

PERFORMANCE OBJECTIVES

2. The student will be allowed a periodic table. The student will define basic chemical terms/ concepts. Performance will be satisfactory if concepts/terms are defined and the definitions are consistent with the text and lecture and 75%are correctly defined on the test or homework. The following Content Goals are related to this PO : 2, 5, 13, 14, 16, 22, 26, 27, 28, 42, 43, 50, 54, 83, 93, and 94.

3. The student will be a periodic table. The student will write correct symbols or names.. Performance will be satisfactory if symbols/names are written and/are consistent with examples from the text and lecture) and 75% of the names /symbols are correctly written during the testing period or on homework assignments. The following Content Goals are related to this PO : 3, 52, 63, 64, and 68.

6. The student will be allowed references. The student will analyze data relationships. Performance will be satisfactory if problems are solved or correct conclusions drawn that are consistent with given examples and / or equations 75% of the time. The following Content Goals are related to this PO : 1, 4, 6, 7, 8, 9, 10, 11, 12, 15, 17, 19, 20, 21, 45, 47, 49, 55, 56, 58, 61, 62, 65, 66, 67, 69, 70, 71, 72, 73, 74, 75, 76, 77, 84, 85, 87, 88, 89, 90, 91.

32. The student will be allowed references. The student will conduct experiments. Performance will be satisfactory if experiments are conducted and the procedures followed are consistent with lab directions and/or teacher's instructions. Experiments from the lab text or teacher defined experiments will be used. Experiments that students are asked to design must be approved by the instructor before being conducted. Lab work must meet teacher defined standards. The following Content Goals are related to this PO : 32, 33, 34, 35, 37, 38, 48, 53, 57, and 82.

39. The student will be allowed references. The student will write accurate reports of activities and laboratory work and assigned research . Performance will be satisfactory if data is accurately reported as it was collected and correct grammar is used. The report should follow a format designated by the instructor and be turned in on time. Reports of all activities and lab experiments are required. The following Content Goals are related to this PO : 29, 30, 31, 36, 39, 40, 44, and 46.

51. The student will be allowed appropriate charts. The student will describe/compare chemical and physical terms. Performance will be satisfactory if terms are described and the description/comparison is consistent with the text and lecture and 75% of the terms are described/compared on the test or homework. The following Content Goals are related to this PO : 18, 23, 24, 25, 51, 59, 60, 80, 81, 86, 92.

79. The student will be allowed a periodic table. The student will draw models or diagrams . Performance will be satisfactory if models drawn are consistent with examples in the text and from lecture and 75% are drawn correctly during the test or on homework. The following Content Goals are related to this PO : 41, 78, and 79.

Developed/Revised: May 7, 2004