This is an experimental course of study designed to introduce the junior high school student to the field of chemistry through his knowledge and understanding of chemical reactions which take place in his world. The everyday experiences which the student encounters show the classification, phases, and changes of matter. No prerequisite courses are suggested for this study of the World of Matter. Several state-adopted texts are listed, including those of physical science, general science, chemistry and the nature of matter. Six performance objectives are suggested based on a course outline divided into six major topics: (1) Matter; (2) States of Matter; (3) Changes in Matter; (4) Classification of Matter; (5) Observation of Chemical Reactions; and (6) Practical Use of Chemistry. Student-involved activities include experiments (drawn from several different sources), and viewing of films. A list of 16 reference books is included. A master sheet organizes the laboratory experiments, the student texts, the supplementary references and films and/or transparencies to be used with each of the major concepts to be presented. (Author/EB)
AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

THE WORLD OF MATTER

5311.07
5312.07
5313.07

(Experimental)
THE WORLD OF MATTER

5311.07
5312.07
5313.07

(Experimental)

Written by Ronald J. Matzuga
for the
DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida
1972
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THE WORLD OF MATTER

COURSE DESCRIPTION

This course is designed to introduce the student to the field of chemistry through his knowledge and understanding of common chemical reactions which take place in his world. These everyday experiences will show the classification, phases, and changes of matter.

ENROLLMENT GUIDELINES

None

STATE ADOPTED TEXTS


PERFORMANCE OBJECTIVES

1. The student will classify matter as organic or inorganic.

2. The student will identify materials as to their state (phase) of matter.

3. After performing several experiments, the student will classify the types of changes in matter.

4. Given a list of common substances, the student will identify each as an element, compound or a mixture.

5. Given a list of chemical reactions involving common materials, the student will identify the type of each reaction.

6. Given a practical situation, the student will explain the principle of chemistry involved.
COURSE OUTLINE

I. Matter
   A. Organic
   B. Inorganic

II. States (Phases) of Matter
   A. Solid
   B. Liquid
   C. Gas

III. Changes in Matter
   A. Physical
      1. Evaporation
      2. Distillation
      3. Melting
      4. Freezing
   B. Chemical

IV. Classification of Matter
   A. Elements
   B. Compounds
   C. Mixtures

V. Observation of Chemical Reactions
   A. Decomposition
   B. Synthesis
   C. Replacement
VI. Practical Use of Chemistry

A. Combustion and Combustible Materials

B. Cleaning Agents and Solvents

C. Refrigeration

D. Oxidation (rusting)

E. Insecticides

F. Detergents and bleaches

G. Hard and soft water
EXPERIMENTS


1. Calibrating a Thermometer (Inv. 34, p. 191)
2. Water and Ice (Inv. 35, p. 200)
3. Ice, Salt, Sugar, and Alcohol (Inv. 36, p. 201)
4. Behavior of Matter Under Condition of Low Temperature (Inv. 37, p. 203)


5. Recognizing the Changes (p. 16)


7. Reactions of Functional Organic Groups (Exp. 48, p. 199)
8. Temperature and Change of State (Phase Change) (Exp. 5, p. 21)
9. Changes in Matter (Exp. 4, p. 17)


10. The Alkanes—Saturated Hydrocarbons (p. 576)
11. Changes in Matter (p. 18)
12. Decomposition by Electrolysis (p. 60)
13. Decomposition by Heat (p. 61)
14. Oxidation—Reduction (p. 284)
15. Oxidation and Electrons (pp. 285-6)
16. Hard Water (p. 472)
17. The Formation of Hard Water (p. 473)


18. Decomposition of Sodium Chlorate (Exp. 6.1, p. 101)
19. Decomposition of Water (Exp. 6.2, p. 104)
20. Synthesis of Zinc Chloride (Exp. 6.4, p. 106)
21. A Reaction with Copper (Exp. 6.6, p. 110)
22. Reduction of Copper Oxide (Exp. 6.7, p. 111)


23. What is Slow Oxidation? (p. 94)

24. Investigation (p. 264)
25. A Mixture (Inv. p. 18)
26. Soap Making (Inv. p. 141)
27. The Nature of Cleaning (Inv. p. 144)


28. An Apprentice Investigation of a Form of Carbon (p. 177)
29. An Apprentice Investigation of Burning Gas (p. 189)
30. An Apprentice Investigation into Breaking Down Sucrose (p. 193)
31. An Apprentice Investigation into Changes of State (p. 168)
32. An Apprentice Investigation of Substances in an Apple (p. 7)
33. An Apprentice Investigation into Combustion (p. 13)
34. An Apprentice Investigation of Oxygen and Oxidation (p. 11)
35. An Apprentice Investigation of Substances in Natural Water (p. 17)
36. An Apprentice Investigation into the Composition of Water (p. 19)
37. An Apprentice Investigation of Proportion in a Compound (p. 33)
38. An Apprentice Investigation of Electrons (p. 39)
39. An Apprentice Investigation into the Separation of a Metal from an Ore (p. 306)
40. An Apprentice Investigation of a Decomposition Reaction (p. 38)
41. An Apprentice Investigation of the Reaction of Iron with Copper Chloride (p. 383)
42. An Apprentice Investigation of the Reaction of Iron with an Acid (p. 385)
43. An Apprentice Investigation of the Reaction of Chlorine with Potassium Iodide (p. 387)
44. An Apprentice Investigation of a Reaction that Forms a Precipitate (p. 391)
45. An Apprentice Investigation of the Reactions of Substances with Litmus (p. 393)
46. An Apprentice Investigation of the Reaction of an Acid with a Base (p. 395)


47. Finding the Right Solution (p. 22)
48. Demonstration (p. 32)
49. Does the Solute Settle Out of the Solvent (p. 19)
50. How Much Solute Can a Solution Hold (p. 29)
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53. What is a Soap (p. 86)
54. The Forms of Water (Exp. 2-1, p. 32)
55. The Forms of Sulfur (Exp. 2-2, p. 33)
56. Building Replicas of Crystals (Exp. 2-3, p. 37)
57. Gases and Heat (Exp. 6-1, p. 127)
58. Testing for Caloric Fluid (Exp. 6-2, p. 129)
59. Testing Volume Change (Exp. 6-3, p. 132)
60. The Mixing of Gases (Exp. 6-4, p. 134)
61. Characteristics of Solutions (Exp. 3-1, p. 53)
62. Other Kinds of Mixtures (Exp. 3-2, p. 55)

63. How Do Metals Combine with Nonmetals? Teacher Demonstration (p. 70)
64. What Other Types of Double Replacements Are There? Try This Experiment (p. 77)
65. Which Metal is More Active: Zinc or Copper? Try This Experiment (p. 80)

66. Matter Takes Up Space (p. 31)
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69. Liquids (p. 33)
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71. Mixtures (p. 40)
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73. Decomposition of Sugar (p. 65)
74. Decomposition with a Catalyst (p. 66)
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76. Chemical Equilibrium: Composition of Mercury II (p. 67)
77. Chemical Equilibrium: Decomposition Reaction of Mercuric Oxide (p. 68)
78. Electrolysis of Water (p. 69)
79. Oxidation of Hydrogen Produces Water (p. 70)
FILMS
Available from Dade County Audiovisual Center

1. Carbon and Its Compounds
   AV#1-01762, 10', BW

2. Chemical Changes
   AV#1-10910, 12', C

3. Combustion
   AV#1-10741, 15', C

4. Physical and Chemical Change
   AV#1-10741, 26', BW

5. Simple Changes in Matter
   AV#1-01335, 10', BW

6. Solids, Liquids, and Gases
   AV#1-01739, 10', BW

7. Refrigeration
   AV#1-03551, 10', BW

8. States of Matter
   AV#1-01949, 10', BW

TRANSPARENCIES
Available from Dade County Audiovisual Center

1. Chemistry Laboratory Techniques
   AV#2-00184, BW
REFERENCES


# Master Sheet—The World of Matter

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