CHEMISTRY I

LENGTH OF TIME: 90 minutes daily for one semester

GRADE LEVEL: 10-12

COURSE STANDARDS:
Students will:
1. Describe the basics of atomic structure and the chemical bond. (PA Std 3.4a)
2. Summarize the mechanics of chemical reactions. (PA Std 3.4a, 3.4b)
3. Compute chemical relationships. (PA Std 3.4a)
4. Manipulate chemical apparatus in the lab. (PA Std 3.7a, 3.7b)
5. Use the Internet and other forms of technology in a practical manner. (PA Std 3.4a, 3.4b, 3.2a, 3.2b, 3.2c, 3.7a, 3.7b, 3.7c, 3.7d, 3.7e)

RELATED PA ACADEMIC STANDARDS FOR SCIENCE AND TECHNOLOGY
3.2 Inquiry and Design
- A. Nature of Scientific Knowledge
- B. Process Knowledge
- C. Scientific Method

3.4 Physical Science, Chemistry and Physics
- A. Matter
- B. Energy

3.7 Technological Devices
- A. Tools
- B. Instruments
- C. Computer Operations
- D. Computer Software
- E. Computer Communication Systems

PERFORMANCE ASSESSMENTS:
Students will demonstrate achievement of the standards by:
1. Producing a chart showing the patterns in electron configuration. (Course Standard 1)
2. Matching electron configurations/properties with the periodic table. (Course Standard 1)
3. Developing a key to predict chemical reactions. (Course Standard 1, 2)
4. Maintaining a daily journal of class information. (Course Standard 1,2,3,4)
5. Performing experiments to demonstrate chemical reactions. (Course Standards 1,2,3,4)
6. Writing laboratory reports. (Course Standards 1,2,3,4)
7. Preparing solutions needed for laboratory activities. (Course Standard 1)
8. Determining concentration of solutions. (Course Standards 2,3,4)
9. Developing a game that will describe some basic concepts in chemistry. (Course Standards 1,2,3,4)

10. Compile an Internet-based research report on various topics of chemistry and science including, web page evaluation techniques, recycling, the periodic table, and some aspect of forensics. (Course Standards 1,2,3,4,5)

DESCRIPTION OF COURSE:
The objective of Chemistry I is to help students develop a greater understanding of basic atomic structure, its application to chemical reactions, and the everyday world of science and technology around us.

TITLES OF UNITS:

1.	Study of Matter	1 week
2.	Chemical Bonds	2 ½ weeks
3.	Formulas/Equations	3 weeks
4.	Gases	2 ½ weeks
5.	Solid State	1 week
6.	Solutions	1 week
7.	Atomic Theory and Structure	2 weeks
8.	Periodic Table	1 week
9.	Moles/Stoichiometry	2 weeks
10.	Tools of Technology	1 week

SAMPLE INSTRUCTIONAL STRATEGIES:
1. Cooperative learning groups
2. Problem solving activities
3. Small group activities
4. Individual activities
5. Process writing
6. Lecture and discussion
7. Multimedia presentations
8. Simulations of chemical reactions
9. Model construction
10. Laboratory activities
11. Technology assisted learning
12. Research activities
13. Student created flow charts/concept maps/posters
14. Internet-based research projects

MATERIALS:
1. Text, Chemistry; T. Myers, K. Oldham, S. Tocci; Holt, Rinehart and Winston; 2006
2. Computers and appropriate software
3. Selected audio visual materials
4. Laboratory instruments
5. Various chemical tables
6. Chemicals/glassware/equipment
7. Art supplies

METHODS OF ASSISTANCE AND ENRICHMENT:

1. Opportunities for retesting
2. Tutorial opportunities
3. Pretests and test previews
4. Extra credit opportunities
5. Study guides/work sheets
6. Collaborative assessment opportunities
7. Alternative modes of assessment
8. Resource room

PORTFOLIO DEVELOPMENT:

In order to document achievement and show evidence of improvement in science, students may include selections from the following in their portfolios:

1. Lab reports
2. Scientific writing
3. Projects
4. Tests/quizzes
5. Drawings/models
6. Graphic organizers

METHODS OF EVALUATION:

1. Tests and quizzes
2. Homework
3. Oral presentations
4. Laboratory reports
5. Research papers
6. Group and individual projects

INTEGRATED ACTIVITIES:

1. Concepts
   -vocabulary definition and use
   -discussions
   -use of technology

2. Communication
   -reading and discussing
   -writing for a variety of purposes
   -responding orally and in writing
   -listening and understanding oral messages

3. Thinking/Problem Solving
   -drawing conclusions
   -inferring meanings from text

4. Application of Knowledge
   -computer aided research
   -use of laboratory instruments
   -molecular model construction

5. Interpersonal Skills
   -enrichment - reading various related material
   -remediation - conferencing