

**CHEMISTRY 2 – GRADE 11 - 12
PLANNED COURSE CURRICULUM GUIDE**

I. COURSE DESCRIPTION AND INTENT: CHEMISTRY II

II. INSTRUCTIONAL TIME:

Class Periods:

Length of Class Periods (minutes): 42 minutes

Length of Course: 180 days; 120 clock hours

Unit of Credit:

Course Weight:

A GREAT PLACE TO LEARN!



PINE GROVE AREA SCHOOL DISTRICT
PINE GROVE, PENNSYLVANIA

PINE GROVE AREA SCHOOL DISTRICT
Pine Grove, Pennsylvania 17963

PLANNED COURSE ADAPTATIONS/MODIFICATIONS
Introduction

The instructional adaptations that follow are provided as suggestions to be implemented with all students, particularly with those in need of special education services including the gifted. This listing is in no way intended to be exhaustive. Rather, it is reflective of some major considerations in the area of curriculum adaptations/modifications.

These instructional adaptations will work with any student, but are especially beneficial to those in need of learning support. Some may argue that these modifications are simply *good teaching*. Indeed, modifications of this type do represent good teaching. These principles of good teaching become instructional modifications whenever: (1) certain students in a particular class require such modifications *above and beyond* what is typically required by *most* students in that class and (2) without these modifications, these same students would not succeed.

PREFACE

Users and information seekers should familiarize themselves with the purpose and terminology of this **Planned Course Curriculum Guide (PCCG)**. We suggest that you first read the following:

- **PCCG PURPOSE AND INTENT**
- **PCCG DEFINITIONS**

The PCCG specifies the unit lesson outcome, essential content, standards, activities, resources, and evaluation of student performance. This sector provides the means to initiate the learning activities to attain the program goal as identified in the course description and intent.

The standards and outcomes are minimal expectations; further embellishment of the course is discretionary with the instructor depending upon the capability of the students.

This PCCG is designed as an ACTIVE document capable of technological modification as required.

The instructional delivery of this curriculum is quality controlled through the lesson plan development of the teacher.

Lawrence J. Mussoline, Jr., Ph.D.
Superintendent of Schools

PLANNED COURSE CURRICULUM GUIDE (PCCG) PURPOSE AND INTENT

The Planned Course Curriculum Guide (PCCG) is a multi-purpose document:

- All staff, particularly new teachers, can understand instructional expectations through the WRITTEN curriculum
- A continuing district-wide instructional process and scope and sequence of subject matter are enhanced. The WRITTEN curriculum is delivered through the TAUGHT curriculum (instructional content and learning activities) and is evaluated through the TESTED curriculum (expected levels of student achievement - learning outcomes)
- Priority student-centered outcomes are identified and attained through suggested learning activities and content designed to help insure a balanced and comprehensive basic curriculum
- Essential content and course standards provide an efficient basis for selecting appropriate instructional materials and resources
- Staff development areas for curriculum improvement are provided
- The PCCG conforms with current Pennsylvania Department of Education curriculum regulations and serves the dual feature of providing both an administrative document and an instructional guide
- Content and subject format remain flexible and adaptable to modification - an "active" document
- Special Pennsylvania Department of Education (PDE) legislation is identified
- Parents and students are provided with an overview of the instructional program and each course in particular

PLANNED COURSE CURRICULUM GUIDE (PCCG) DEFINITIONS

- **Course Description and Intent**: a brief overview of the course and program goals
- **Instructional Time**: frequency of class meetings and time/appropriate credit at the secondary level
- **Special Notes**: emphatic features or highlights and identification of Department of Education mandates found in the course
- **Unit Lesson Outcome**: describes the knowledge, skills, attitudes, student performance behaviors and areas of study that have been identified as appropriate to help the student attain the rigorous standards of a quality education
- **Teaching-Learning Activities**: suggested activities designed to help all students achieve the learning outcomes and standards
- **Standards**: statements establishing the minimal knowledge, skills, performance behaviors, and essential learning (content) a student must attain. A standard defines what students should know and be able to do
- **Expected Levels of Achievement (Learning Outcomes)**: what students will be expected to do as a result of the application of teaching-learning activities and content
- **Evaluation Criteria (Actual Level of Attainment)**: student performance level achieved and measured through specified evaluation criteria

LEARNING STANDARDS AND CONTENT ACTIVITIES

Statement of student learning expectations achieved through suggested teaching-learning activities and selected content to help reach standards and graduation requirements.

Academic Content Standard #1:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ☺</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 1			
1.48.12 Discern structural and functional relationships in living things.	1.48.12 _____.		
1.49.12 Explain how genetic information is passed from one generation to the next at the molecular level.	1.49.12 _____.		
1.50.12 Explain the theory of evolution.	1.50.12 _____.		
1.51.12 Analyze the chemical and structural basis of living organisms.	1.51.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #2:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ☺</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
<p>STANDARD 2</p> <p><u>Structure and Preparation of Matter</u></p> <p>2.27.12 Apply concepts about the structure and properties of matter.</p> <p>A. Identify factors affecting reaction rates including catalysts</p> <p>B. Quantity chemical properties by applying mathematical formulas</p> <p>C. Relate the forces that bind solids, liquids and gases together to their atomic or molecular structure</p> <p>D. Predict physical and chemical properties through the use of the periodic table</p> <p>E. Classify types of chemical reactions</p>	<p>2.27.12</p> <p>A. Lab on the effects of temperature on exo and endo thermic reactions as well as the effects of catalysts</p> <p>B. Boyle's law, Charles' law and ideal gas law labs</p> <p>C. Freezing point depression and boiling point elevation labs</p> <p>D. Lecture (with molecular models) on dipole-dipole, induced dipole, dispersion, and hydrogen bonding; relate the strength of each type of intermolecular force to familiar compounds containing the force</p> <p>E. Types (groups) of elements laboratories; students will run reactions with elements from the same group and see the similarities in reactivity and other properties</p>	<p>2.27.12</p> <ul style="list-style-type: none"> • Tests • Lab reports • Homework problems • Lab work in a safe manner 	<p>2.27.12</p> <ul style="list-style-type: none"> • Chemistry textbook • Tests (teacher generated) • Lab materials and equipment • Homework problems / worksheets • Molecular models • ChemMedia videodisk and player with TV • Chemtutor program and computer

<p>F. Describe nuclear reactions in equation form</p> <p>G. Estimate the age of materials that contain radioactive isotopes by using the predictability of nuclear decay</p> <p>H. Predict chemical properties (e.g., reactivity) based on atomic structure</p> <p>I. Apply rules of systemic nomenclature and formula writing to chemical substances and reactions</p>	<p>F. Brief lecture on the general types of chemical reactions, then lab where students perform and identify the types of reactions in the lab</p> <p>G. Student exercise involving practice with alpha, beta and other types of particles / radiation where the new elements will be predicted</p> <p>H. Student exercise in solving half-life problems</p> <p>I. Students will be expected to give the chemical formula if given the compound name, or vice-versa, in all that they do in the lab, Chemtutor program for correction</p>		
<p>2.28.12 Apply and analyze energy sources and conversions and their relationship to heat and temperature.</p> <p>A. Calculate heat involved in illustrative chemical reactions</p> <p>B. Evaluate mathematical formulas that calculate the efficiency of specific chemical systems</p> <p>C. Illustrate chemical concepts through the use of models</p> <p>D. Demonstrate an understanding of energy and heat by applying appropriate formulas to solve problems</p>	<p>2.28.12</p> <p>A. Calorimetry lab (melting ice, burning candle wax) where the heat transfer is measured and compared to the accepted value, find possible sources of error between our experimental results and what a mathematical formula predicts we should get</p> <p>B. Lecture and student exercises in solving specific heat, heat of combustion, etc. problems</p> <p><u>Correctives:</u> Chemtutor for correction</p> <p><u>Extensions:</u></p>	<p>2.28.12</p> <ul style="list-style-type: none"> • Tests • Homework • Lab reports • Lab work in a safe manner 	<p>2.28.12</p> <ul style="list-style-type: none"> • Chemistry textbooks • ChemMedia videodisk and player with TV • Tests • Lab materials and equipment • Chemtutor program and computers • Homework problems / worksheets

LEARNING STANDARDS AND CONTENT ACTIVITIES

Statement of student learning expectations achieved through suggested teaching-learning activities and selected content to help reach standards and graduation requirements.

Academic Content Standard #6:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
<p>STANDARD 6</p> <p><u>Tech and Devices (Physics)</u> <u>Technological Devices (6-our chart)</u></p> <p>6.22.12 Apply advanced tools, materials and techniques to answer complex questions.</p> <p>A. Demonstrate the safe use of complex tools and machines within their specifications</p> <p>B. Select and safely apply appropriate tools, materials and processes necessary to solve complex problems that could result in more than one solution</p> <p>C. Evaluate and use technological resources to solve complex multi-step problems</p>	<p>6.22.12</p> <ul style="list-style-type: none"> • Lab work with specialized apparatus designed to do specific jobs • Students design, plan, construct, perform, and evaluate their own experiments accounting for the product yield and any by products • Students may use computer probes that measure temperature, pressure, etc. in their experiments • Students will use spectrophotometers and ultraviolet chromatography to characterize their products 	<p>6.22.12</p> <ul style="list-style-type: none"> • Safe and effective lab work involving various pieces of apparatus (condensers, spectrophotometers, distillation columns, etc.) • Lab reports • Design of experiments that incorporates different technological devices and techniques 	<p>6.22.12</p> <ul style="list-style-type: none"> • Lab materials and equipment (glassware, instruments, etc.)

<p>6.23.12 Evaluate appropriate instruments and apparatus to accurately measure materials and processes.</p> <p>A. Use appropriate instruments to accurately measure scientific and technologic phenomena within the error limits of the equipment</p> <p>B. Evaluate the appropriate use of different measurement scales (macro verses micro)</p> <p>C. Evaluate the utility and advantages of a variety of absolute and relative measurement scales for their appropriate application</p>	<p>6.23.12</p> <ul style="list-style-type: none"> • Labs that use spectrophotometers and computer probes to measure temperature and pressure • Exercise contrasting the use of manometers verses kilometers, etc. to demonstrate matching scale to object size 	<p>6.23.12</p> <ul style="list-style-type: none"> • Students will use instruments and equipment in a safe and effective manner • Lab reports • Students will select and use the appropriate measurement scales in the lab 	<p>6.23.12</p> <ul style="list-style-type: none"> • Lab materials, apparatus, equipment and instruments
<p>6.24.12 Evaluate computer operations and concepts as to their effectiveness to solve specific problems.</p> <p>A. Analyze and solve hardware and advanced software problems</p> <p>B. Assess and apply multiple input and output devices to solve specific problems</p>	<p>6.24.12</p> <ul style="list-style-type: none"> • Chemtutor program must be run with as little teacher assistance as possible • Use computer probes to collect data and printers to print out collected data 	<p>6.24.12</p> <ul style="list-style-type: none"> • Tutorial work with Chemtutor • Experiments using computer probes 	<p>6.24.12</p> <ul style="list-style-type: none"> • Lab materials, computers, probes and equipment • Chemtutor program
<p>6.25.12 Evaluate the effectiveness of computer software to solve specific problems.</p> <p>A. Look up the legal responsibilities of computer users</p> <p>B. Demonstrate the ability to merge software to produce an output</p> <p>C. Analyze, select and apply</p>	<p>6.25.12</p> <ul style="list-style-type: none"> • Students must know and accept the computer use agreement of Pine Grove Area School District • Students will use Chemtutor according to our site license • Use the computer probe software from Vernier in conjunction with PowerPoint to present the result of an experiment to the class 	<p>6.25.12</p> <ul style="list-style-type: none"> • Follow the laws concerning the use of computer software / hardware • Use data gathering software as well as word processing and presentation software in presenting experimental results to the class 	<p>6.25.12</p> <ul style="list-style-type: none"> • Lab materials, equipment, instruments, computer probes, computers • Computer software (PowerPoint, Microsoft Word, Vernier software) • Printers • LCD overhead display or a large monitor

<p>the appropriate software to produce an output</p> <p>D. Design and apply advanced multimedia techniques</p> <p>E. Evaluate the effectiveness of the computer as a presentation tool</p> <p>6.26.12 Assess the effectiveness of computer communications systems.</p> <ul style="list-style-type: none"> Analyze the effectiveness of on-line information resources to meet the needs for collaboration, research, publications, communications and productivity 	<p>6.26.12</p> <ul style="list-style-type: none"> Have students use internet or electronic database resources to look up physical or chemical constants; then have students look up the same information in print Have students analyze the advantages and disadvantages of print and electronic media 	<p>6.26.12</p> <p>Students will use on-line resources in their lab reports</p>	<p>6.26.12</p> <ul style="list-style-type: none"> Computers with internet access Print media Lab materials and equipment
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LEARNING STANDARDS AND CONTENT ACTIVITIES

Statement of student learning expectations achieved through suggested teaching-learning activities and selected content to help reach standards and graduation requirements.

Academic Content Standard #7:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
<p>STANDARD 7</p> <p>7.7.12 Apply scientific research methods to complex problems.</p> <p>A. Generate questions that can be studied in Science</p> <p>B. Evaluate the appropriateness of questions</p> <p>C. Design an investigation with adequate control and limited variables to investigate a question</p> <p>D. Conduct an experiment</p> <p>E. Organize experimental information using analytic and descriptive techniques</p> <p>F. Evaluate the significance of experimental information in answering the question</p> <p>G. Project additional questions from a research study that could be</p>	<p>7.7.12</p> <ul style="list-style-type: none"> • All content outcomes for 3.7.12A can be met by having students design experiments from the question to the conclusion (lab report) and having the students analyze sources of error and suggest additional experiments to answer questions that arise during experimentation 	<p>7.7.12</p> <ul style="list-style-type: none"> • Lab reports • Safe lab work • Efficient lab work 	<p>7.7.12</p> <ul style="list-style-type: none"> • Lab materials and equipment

<p>7.8.12 studied Apply problem solving in Technology as a systematic process.</p> <p>A. Assess the problem</p> <ol style="list-style-type: none"> 1. Appraise all aspects of the problem. 2. Prioritize the necessary information. 3. Formulate questions that must be answered. <p>B. Propose, develop and appraise a solution</p> <ol style="list-style-type: none"> 1. Design, develop and prioritize alternative methods to achieve solutions. 2. Develop and assess the best or appropriate methodology. <p>C. Implement and assess the solution</p> <ol style="list-style-type: none"> 1. Produce, apply and appraise a specific solution. <p>D. Evaluate and assess the solution</p> <ol style="list-style-type: none"> 1. Assess, redesign and improve if necessary. 2. Analyze and contrast the impacts of the solution. <p>E. Communicate and assess the problem, design and solution</p>	<p>7.8.12</p> <ul style="list-style-type: none"> • Student designed and analyzed experiments which are based on the scientific method 	<p>7.8.12</p> <ul style="list-style-type: none"> • Lab reports after completion of the experiment • Pre lab reports 	<p>7.8.12</p> <ul style="list-style-type: none"> • Lab materials and equipment
<p>7.9.12 Evaluate the nature of scientific and technological knowledge.</p> <p>A. Know and use the ongoing scientific processes to continually improve and better understand how things work</p> <p>B. Critically compare or contrast the status of existing theories</p>	<p>7.9.12</p> <ul style="list-style-type: none"> • Have students suggest better or alternate ways to execute various chemical processes • Have students investigate how a product is made and suggest different ways to produce it • Have students write a report or make a presentation on the different atomic theories 	<p>7.9.12</p> <ul style="list-style-type: none"> • Lab reports • Report on how a product is made (including ways to improve it) • Report on atomic theories 	<p>7.9.12</p> <ul style="list-style-type: none"> • Lab materials and equipment • Print and electronic media for reports on product manufacture as well as atomic theories

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #8:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
<p>STANDARD 8</p> <p>8.12.12 Apply the concepts of systems, subsystems, feedback and control to solve complex technological problems.</p> <p>A. Demonstrate knowledge of systems concepts by designing and modeling control systems that solve specific problems</p> <p>B. Apply systems analysis to predict results</p> <p>C. Analyze and describe the function, interaction and relationship among subsystems and the system itself</p> <p>D. Compare and contrast several systems that</p>	<p>8.12.12</p> <ul style="list-style-type: none"> • Design experiments that require some control of a limiting step in terms of time or concentration, manipulate the system to enhance the desired outcome • Have students analyze the function of each step in a multi-step reaction • Have students suggest the steps in an experiment that contribute to lost yield and inefficiency and how to correct them 	<p>8.12.12</p> <ul style="list-style-type: none"> • Lab reports • Experiment design that accounts for control of key steps in a multi-step chemical process 	<p>8.12.12</p> <ul style="list-style-type: none"> • Lab materials and equipment

<p>could be applied to solve a single problem</p> <p>E. Evaluate the causes of a system's inefficiency</p>			
<p>8.13.12 Apply concepts of models as a method to predict and understand science and technology.</p> <p>A. Evaluate technological processes by collecting data and applying mathematical models</p> <p>B. Apply knowledge of complex physical models to interpret data and apply mathematical models</p> <p>C. Appraise the use of computer models in interpreting science and technological systems</p>	<p>8.13.12</p> <ul style="list-style-type: none"> • Calorimetry lab where data is collected and mathematical formulas are used to calculate the heat loss due to friction • Use knowledge of atomic structure (quantum theory) to explain physical phenomena (photoelectric effect and the wave / particle duality of light) • Explore the role of computers in scientific research (how they are used, their necessary use, etc.) 	<p>8.13.12</p> <ul style="list-style-type: none"> • Tests • Lab reports • Report on the quantum theory model of the atom • Report on computers in science 	<p>8.13.12</p> <ul style="list-style-type: none"> • Chemistry textbook • Computers • Lab materials and supplies • Print and electronic media
<p>8.14.12 Assess and apply patterns in science and technology.</p> <p>A. Assess and apply recurring patterns in natural and technological systems</p> <p>B. Compare and contrast structure and function relationships as they relate to patterns</p> <p>C. Assess patterns in nature using mathematical formulas</p>	<p>8.14.12</p> <ul style="list-style-type: none"> • Use the lab on periodic trends to apply a recurring pattern to predict chemical properties • Use chemical laws (conservation of energy, Ideal gas law, etc.) and their mathematical forms to explain patterns in nature (climate, laws of thermodynamics, etc.) 	<p>8.14.12</p> <ul style="list-style-type: none"> • Tests • Homework • Lab reports 	<p>8.14.12</p> <ul style="list-style-type: none"> • Tests • Chemistry textbooks • Lab resources (materials and supplies) • Worksheets or homework problems
<p>8.15.12 Analyze scale as a way of relating concepts and ideas to one another by some measure.</p> <p>A. Compare and contrast various forms of dimensional analysis</p> <p>B. Assess the use of several units of measurement to the same problem</p> <p>C. Analyze and apply appropriate</p>	<p>8.15.12</p> <ul style="list-style-type: none"> • Use dimensional analysis to convert from one unit of measurement to another • Also, use dimensional analysis to solve and check other types of problems (gas laws, thermodynamics problems, mass-mass stoichiometry problems) • Show the disadvantages of using English measurements over metric 	<p>8.15.12</p> <ul style="list-style-type: none"> • Tests • Homework problems • Lab reports • Chemtutor program (self test) 	<p>8.15.12</p> <ul style="list-style-type: none"> • Chemistry textbooks • Tests • Worksheets/homework problems • Chemtutor program and computers

measurement scales when collecting data	measurements <ul style="list-style-type: none">• Show the disadvantages of using an improper (too small or too large) measurement scale in the lab• Chemtutor program for extra practice		
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LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #10:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 10			
10.26.12 Categorize stream order in a watershed.	10.26.12 _____.		
10.27.12 Explain the relationships that exist within watersheds of the United States.	10.27.12 _____.		
10.28.12 Analyze the parameters of a watershed.	10.28.12 _____.		
10.29.12 Analyze the complex and diverse ecosystem wetlands.	10.29.12 _____.		
10.30.12 Identify and describe natural and human events on watersheds and wetlands.	10.30.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #11:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 11 11.24.12 Analyze the use of renewable and nonrenewable resources. 11.25.12 Analyze factors affecting the availability of renewable and nonrenewable resources. 11.26.12 Analyze factors that influence the availability of natural resources. 11.27.12 Evaluate solid waste management practices.	11.24.12 _____. 11.25.12 _____. 11.26.12 _____. 11.27.12 _____		

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard 12:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 12			
12.18.12 Analyze the complexity of environmental health issues.	12.18.12 _____.		
12.19.12 Analyze the local, regional and national impacts of environmental health.	12.19.12 _____.		
12.20.12 Analyze the need for a healthy environment.	12.20.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #13:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 13			
13.17.12 Analyze the management practices in the agriculture business.	13.17.12 _____.		
13.18.12 Analyze and research the social, political and economic factors that affect agricultural systems.	13.18.12 _____.		
13.19.12 Analyze research and development activities as they relate to agriculture.	13.19.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #14:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 14			
14.7.12 Identify similar classifications of pests that may or may not have similar effects on different regions.	14.7.12 _____.		
14.8.12 Research and analyze integrated pest management strategies globally.	14.8.12 _____.		
14.9.12 Determine the effects of integrated pest management practices on society over time.	14.9.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

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Academic Content Standard #15:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 15 15.18.12 Analyze the interdependence of an ecosystem. 15.19.12 Analyze the impact of cycles on the ecosystem. 15.20.12 Analyze how human action and natural changes affect the balance within an ecosystem.	15.18.12 _____. 15.19.12 _____. 15.20.12 _____		

LEARNING STANDARDS AND CONTENT ACTIVITIES

Statement of student learning expectations achieved through suggested teaching-learning activities and selected content to help reach standards and graduation requirements.

Academic Content Standard #16:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 16			
16.18.12 Analyze biological diversity as it relates to the stability of an ecosystem.	16.18.12 _____.		
16.19.12 Examine the effects of extinction, both natural and human caused, on the environment.	16.19.12 _____.		
16.20.12 Analyze the effects of threatened, endangered or extinct species on human and natural systems.	16.20.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

Statement of student learning expectations achieved through suggested teaching-learning activities and selected content to help reach standards and graduation requirements.

Academic Content Standard #17:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 17			
17.22.12 Explain how technology has influenced the sustainability of natural resources over time.	17.22.12 _____.		
17.23.12 Analyze technology's role on natural resources sustainability.	17.23.12 _____.		
17.24.12 Analyze how pollution has changed in quality, variety and toxicity as the United States developed its industrial base.	17.24.12 _____.		
17.25.12 Analyze the international implications of environmental occurrences.	17.25.12 _____.		

LEARNING STANDARDS AND CONTENT ACTIVITIES

Statement of student learning expectations achieved through suggested teaching-learning activities and selected content to help reach standards and graduation requirements.

Academic Content Standard #18:

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS <i>(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful) ©</i>	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
STANDARD 18 18.6.12 Analyze environmental laws and regulations as they relate to environmental issues.	18.6.12 _____		