

**BIOLOGY – GRADE 9
PLANNED COURSE CURRICULUM GUIDE**

I. COURSE DESCRIPTION AND INTENT:

II. INSTRUCTIONAL TIME:

Class Periods:

Length of Class Periods (minutes): 42

Length of Course: 180 days; 120 clock hours

Unit of Credit: 1

Course Weight: 1

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 #4.1.10 Watersheds and Wetlands

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 4.1.10</p> <p>4.1.10 A.</p> <ul style="list-style-type: none"> • Identify Pennsylvania's major watersheds and their related river systems. <p>4.1.10C</p> <ul style="list-style-type: none"> • Identify terrestrial and aquatic organisms that live in a watershed. • Categorize aquatic organisms found in a watershed continuum from headwater to mouth. • Identify the types of organisms that would live in a stream based on a stream's physical characteristic. • Explain the habitat needs of specific aquatic organisms. <p>4.1.10 E</p> <ul style="list-style-type: none"> • Describe how natural events affect a watershed. 	<ol style="list-style-type: none"> 1. Students will trace all major river systems in PA by using a map. 2. Students will shade in the major watersheds. Extension: Name the rivers. <ol style="list-style-type: none"> 1. Students will discuss the types of organisms that live in a watershed. 2. Students will research about the type of organisms in a watershed. Extension: Students will be taken on a hike to identify the organisms in a watershed. <ol style="list-style-type: none"> 1. Students will discuss aquatic organisms in a watershed. 2. Students will perform a stream study and compare their results with other research. <ol style="list-style-type: none"> 1. Students will discuss in the classroom the characteristics of a stream. 2. Students will extrapolate data 	<ul style="list-style-type: none"> - Lecture - Map Study - Worksheets <ul style="list-style-type: none"> - Lecture - Worksheets - Identification Project - Research Project <ul style="list-style-type: none"> - Lecture - Worksheets - Stream Study or Identification of aquatic organisms. <ul style="list-style-type: none"> - Lecture - Worksheets - Stream Study 	<ul style="list-style-type: none"> • Textbook • Teacher designed activity <ul style="list-style-type: none"> • Textbook • Teacher activities • Library & Internet resources <ul style="list-style-type: none"> • Textbook • Other resource book • Other teachers or experts <ul style="list-style-type: none"> • Textbook • Experts with Conservation Office • Teacher designed

<ul style="list-style-type: none"> Identify the effects of human events on watersheds. 	<p>collected from the stream study to determine the stream's characteristic.</p> <ol style="list-style-type: none"> Students will discuss the habitat needs of specific aquatic organisms by listening to teacher instruction. Students will discuss the events in a classroom lecture. Students will watch a video on human affects on watersheds. Students will create a poster to show adverse affects of humans on the watershed. 	<ul style="list-style-type: none"> Lecture Worksheets Lecture Worksheets Notes Poster Worksheets 	<p>activities</p> <ul style="list-style-type: none"> Textbook Chesapeake Bay Foundation resources Textbook Teacher Activities Conservation Office Material Other book materials
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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 #4.3.10: Environmental Health

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 4.3.10</p> <p>4.3.10 A</p> <ul style="list-style-type: none"> • Identify the effects on human health of air, water, and soil pollution and the possible economic costs to society. • Describe how indoor pollution may affect human health. • Explain the costs & benefits of cleaning up contaminants. • Explain how common household cleaning products are manufactured and how to dispose of their byproducts after use. <p>4.3.10 B</p> <ul style="list-style-type: none"> • Explain how human practices affect the quality of the water and soil. 	<p>1. Students will research how human health is affected by pollution.</p> <p>2. Students create a brochure explaining the dangers of pollution.</p> <p>1. Students will create a test to study indoor pollution.</p> <p>1. Students will get a lecture on this material.</p> <p>1. Students will examine cleaning products to see what they are made of and how to dispose of them.</p> <p>1. Students will listen to a guest that will detail how humans have affected soil and water quality.</p> <p>2. Students will create a poster to show these affects.</p>	<ul style="list-style-type: none"> • Lecture • Brochure • Research project <ul style="list-style-type: none"> • Research • Assessment of student generated test of indoor pollution. <ul style="list-style-type: none"> • Worksheet • Tests • Reading Journals <ul style="list-style-type: none"> • Lecture • Teacher Activity <ul style="list-style-type: none"> • Test • Worksheets • Poster Project 	<ul style="list-style-type: none"> • Internet & Library • Textbook • Teacher-designed activities <ul style="list-style-type: none"> • Teacher-designed activities <ul style="list-style-type: none"> • Textbook • Internet • Journals <ul style="list-style-type: none"> • Textbook • Cleaning Products • Internet <ul style="list-style-type: none"> • Conservation Office • Textbook

<ul style="list-style-type: none"> • Identify evidence of natural events around the world and their effects on environmental health. • Identify local & state environmental regulations and their impact on environmental health. • Analyze data and explain how point source pollution can be detected and eliminated. • Identify & explain ways of detecting pollution by using state of the art technologies <p>4.3.10 C</p> <ul style="list-style-type: none"> • Explain species diversity. <ul style="list-style-type: none"> • Analyze the effects of species extinction of the health of an ecosystem. 	<ol style="list-style-type: none"> 1. Students will research these regulations. 2. Students will research for records of environmental quality. <ol style="list-style-type: none"> 1. Students will discuss this by lecture. 2. Students will research and answer questions on this topic. <ol style="list-style-type: none"> 1. Students will discuss what point source pollution is and where it comes from 2. Students will perform a water quality test to detect pollution. <ol style="list-style-type: none"> 1. Students will use environmental indicator kits to detect air, water, and soil pollution. <ol style="list-style-type: none"> 1. Students will be lectured on species diversity. 2. Students will create a transect on an area of land and identify all the plants and animals in the area. <ol style="list-style-type: none"> 1. Students will discuss post species that have become extinct. 2. Students will make an extrapolation of the effects of extinction. 	<ul style="list-style-type: none"> • Quiz • Teacher Assignment • Worksheet • Research Project <ul style="list-style-type: none"> • Test • Worksheets • Research Project <ul style="list-style-type: none"> • Test Worksheets • Results of water quality test <ul style="list-style-type: none"> • Worksheets • Environmental Indicator Kits • Report on Investigation <ul style="list-style-type: none"> • Worksheets • Report on Biodiversity Study <ul style="list-style-type: none"> • Worksheets • Create a graph of extinction 	<ul style="list-style-type: none"> • Internet • Library • Textbook • Government Journals <ul style="list-style-type: none"> • Textbook • Internet & Library <ul style="list-style-type: none"> • Textbook • Internet • Conservation Books <ul style="list-style-type: none"> • Carolina Biological Kits <ul style="list-style-type: none"> • Environmental Literature • Textbook <ul style="list-style-type: none"> • Textbook • Internet • Computer Applications
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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 #4.6.10: Ecosystems & Their Interactions

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 4.6.10</p> <p>4.6.10 A</p> <ul style="list-style-type: none"> • Identify major biomes and explain their similarities and differences. • Compare and contrast the interactions of biotic and abiotic components in an ecosystem. • Analyze the effects of abiotic factors on specific ecosystems. • Describe how the availability of resources affects organisms in an ecosystem. • Explain energy flow in a food chain through an energy pyramid. 	<ol style="list-style-type: none"> 1. Students will create a class poster depicting all major biomes. 1. Students will identify as many biotic and abiotic factors. 2. Students will make an explanation of interaction between a biotic and an abiotic factor. 1. Students will discuss how climate affects biomes. 1. Students will create a chart show which resources on organism uses. 2. Students will study population graphs and make correlations on how resources affect population. 1. Create a poster to show energy flow. 2. Students will dissect owl pellets and identify organisms in a food chain. 1. Students will discuss the energy 	<ul style="list-style-type: none"> • Worksheets • Class Poster • List of Biotic and Biotic factors • Worksheet • Quiz • Worksheet • Test • Chart or Resources • Question on population graph • Worksheet • Owl Pellet lab • Test • Worksheet 	<ul style="list-style-type: none"> • Textbook • Textbook • Textbook • Textbook • Related Textbooks • Internet • Project Learning Tree • Textbook • Textbook • Related sources

<ul style="list-style-type: none"> Evaluate the efficiency of energy flow in a food chain. Explain the concept of carrying capacity in an ecosystem. Explain trophic levels. Identify a specific environmental impact and predict what change may take place to affect homeostasis. Explain & examine how organisms modify their environment to sustain their needs. Assess the effects of latitude and altitude on biomes. Interpret possible causes of population fluctuations. 	<p>in an ecosystem with notes.</p> <ol style="list-style-type: none"> Students will be lectured to about carrying capacity. Students will create a list of limiting factors for a chosen organism. <ol style="list-style-type: none"> Create a chart of organisms in each trophic level and the amount of energy. <ol style="list-style-type: none"> The students will be lectured to. <ol style="list-style-type: none"> The students will learn to read a topographic map. The students will plot biomes on a map. <ol style="list-style-type: none"> Students will create a predator-prey population graph. Students will investigate reasons for rise & fall of populations. <ol style="list-style-type: none"> Students will create posters of different element cycles. <ol style="list-style-type: none"> Students will read passages from Silent Springs. Students will research about affects of human intervention in these cycles. 	<ul style="list-style-type: none"> Worksheet List of Limiting Factors Chart of Trophic levels. Worksheets Worksheets Map Assignment Worksheet Assessment of topographic map. Graph Investigation Worksheets Poster Test Quiz Research Paper Worksheets 	<ul style="list-style-type: none"> Project Learning Tree Textbook Textbook Maps Atlas Textbook Textbooks Project Learning Tree Internet Textbook Teacher designed activities Internet Library
<p>4.6.10 B</p> <ul style="list-style-type: none"> Describe an element cycle and its role in an ecosystem. Explain the consequences of interrupting natural cycles. 	<ol style="list-style-type: none"> Students will create a flipchart of succession. Students will plot an area of land to be free of human intervention. <ol style="list-style-type: none"> Students will create a flipchart of succession. 	<ul style="list-style-type: none"> Worksheets Flipchart Demonstration of succession 	<ul style="list-style-type: none"> Textbook Teacher-designed activities
<p>4.6.10 C</p> <ul style="list-style-type: none"> Identify and explain the succession stages in an ecosystem. Identify causes of succession 	<ol style="list-style-type: none"> Students will create a flipchart of succession. Students will research and make extrapolations of interrupting 	<ul style="list-style-type: none"> Flipchart Worksheet Research Project 	<ul style="list-style-type: none"> Textbook Teacher designed activity Project Learning

- Analyze consequences of interrupting natural cycles.

natural cycles.

Tree

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 #4.7.10: Threatened, Endangered, & Extinct Species

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 4.7.10</p> <p>4.7.10.A</p> <ul style="list-style-type: none"> • Explain the role that specific organisms have in their ecosystem. • Identify a species and explain what effects its increase or decline might have on the ecosystem. • Identify a species and explain how its adaptations are related to its niche in the environment. <p>4.7.10B</p> <ul style="list-style-type: none"> • Describe an organism's adaptations for survival in its habitat. • Compare adaptation among species. <p>4.7.10C</p> <ul style="list-style-type: none"> • Explain factors that could lead to 	<ol style="list-style-type: none"> 1. Students will take notes on this information. 2. Students will write down affects if one organism was missing in an ecosystem. <ol style="list-style-type: none"> 1. Students will write a research paper about an organism in the environment. <ol style="list-style-type: none"> 1. Students will compare each others research papers and identify adaptations. <ol style="list-style-type: none"> 1. Students will be lectured to 	<ul style="list-style-type: none"> • Worksheets • Project • Quiz <ul style="list-style-type: none"> • Paper <ul style="list-style-type: none"> • Comparison chart • Worksheets <ul style="list-style-type: none"> • Worksheets 	<ul style="list-style-type: none"> • Textbook • Project Learning Tree • Teacher designed activity <ul style="list-style-type: none"> • Textbook • Internet • Library <ul style="list-style-type: none"> • Textbook • Research papers <ul style="list-style-type: none"> • Textbook

<p>a species increase or decrease.</p> <ul style="list-style-type: none"> • Explain how management practices may influence the success of specific species. • Identify and explain criteria used by scientists for categorizing organisms as threatened, endangered, or extinct. 	<p>about this topic.</p> <ol style="list-style-type: none"> 1. Students will research management practices. 2. Students will actively perform practices on a given species. <ol style="list-style-type: none"> 1. Student will research criteria and categorize a given organism. 2. Students will compare information with extinct species. 	<ul style="list-style-type: none"> • Worksheets • Teacher Project <ul style="list-style-type: none"> • Worksheets • Research Project • Comparison 	<ul style="list-style-type: none"> • Project Learning Tree • Teacher designed activity <ul style="list-style-type: none"> • Project Learning Tree • Conservation Office Materials • Internet • Textbook
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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 #4.8.10: Humans & The Environment

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 #4.8.10</p> <p>4.8.10A</p> <ul style="list-style-type: none"> • Explain why some societies have been unable to meet their natural resource needs. • Compare & contrast the use of natural resources and the environmental conditions of several countries. • Describe how uses of natural resources impact sustainability. <p>4.8.10B</p> <ul style="list-style-type: none"> • Explain the role of natural resources in sustaining society. • Analyze the effects of a natural resource's availability on a community or region. <p>4.8.10C</p> <ul style="list-style-type: none"> • Analyze and evaluate changes in the environment that are the 	<ol style="list-style-type: none"> 1. Students will receive a lecture. 2. Students will investigate different countries and their natural resources. <ol style="list-style-type: none"> 1. Students will create a posterboard display with information from an assigned country. <ol style="list-style-type: none"> 1. Students will receive a lecture. 2. Students will do an Internet projection on natural resources. <ol style="list-style-type: none"> 1. Students will write a paper on a resource that sustains society. <ol style="list-style-type: none"> 1. Students will have a discussion on the effects of natural resources. 2. Students will make an analysis of how coal affected this region. <ol style="list-style-type: none"> 1. Students will receive a lecture. 2. Students will do a community 	<ul style="list-style-type: none"> • Worksheets • Test • Investigation <ul style="list-style-type: none"> • Display <ul style="list-style-type: none"> • Worksheets • Quiz • Internet Project <ul style="list-style-type: none"> • Paper • Worksheet <ul style="list-style-type: none"> • Worksheets • Coal analysis • Quiz <ul style="list-style-type: none"> • Worksheets • Identification 	<ul style="list-style-type: none"> • Internet • Textbooks • Teacher-designed activities <ul style="list-style-type: none"> • Internet • Textbooks • Library <ul style="list-style-type: none"> • Internet • Textbooks <ul style="list-style-type: none"> • Internet • Textbooks <ul style="list-style-type: none"> • Textbook • History Books • Conservation Office Materials <ul style="list-style-type: none"> • Textbook

<p>result of human activities.</p> <ul style="list-style-type: none"> • Compare and contrast the environmental effects of different industrial strategies. <p>4.8.10 D</p> <ul style="list-style-type: none"> • Identify natural resources for which societal demands have been increasing. • Identify specific resources for which human consumption has resulted in scarcity of supply • Describe the relationship between population density and resource set management. <p>4.9.10 A</p> <ul style="list-style-type: none"> • Explain the positive and negative impacts associated with passing environmental laws and regulations. • Understanding conflicting rights of property owners and environmental laws and regulations. • Analyze the roles that local, state, and federal governments play in developing and enforcing environmental laws. • Identify local and state environmental regulations and their impact on environmental health. • Explain the positive & negative 	<p>walk to identify human activities in the environment.</p> <ol style="list-style-type: none"> 1. Students will contact local businesses to find out differing strategies, then write a summary. 1. Students will receive a lecture. 1. Students will use a project learning tree activity. 2. Students will investigate resources of human and present a chart to show them. 1. Students will study population density in nature and plot the number of species in an area. 1. Students will create a pamphlet explaining environmental laws. 2. Students will research and create posters of how laws have an affect on environmental health. 	<ul style="list-style-type: none"> • Industrial Investigation • Worksheets • PLT Assessment • Teacher-designed assessment • Worksheet • Teacher-designed activity • Teacher activities • Worksheets • Pamphlet • Poster 	<ul style="list-style-type: none"> • Textbook • Local Businesses • Public Records • Textbooks • Periodicals • Project Learning Tree • Teacher-designed activities • Textbook • Textbook • Periodicals • EPA, DEP Information • Conservation Office Materials • Internet
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impacts of endangered species Act.			
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