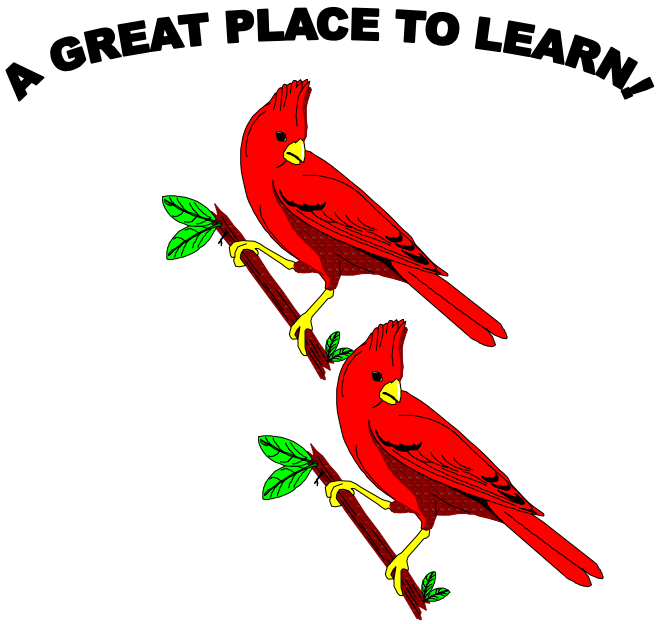
PLANNED COURSE CURRICULUM GUIDE
Computer Programming II: C++ Object-Oriented Programming

I. COURSE DESCRIPTION AND INTENT: In Computer Programming II, students learn to develop computer application software using C++, an object-oriented computer programming language. This course is designed to introduce the concepts and techniques of developing programs using the C++ language. It will emphasize the designing and coding of scientific and mathematical programs.

Students will also be given the freedom to use their creativity and knowledge during the year to develop codes using C++ for their own applications. Research in various careers in the computer programming field will also be included. The year will culminate with students creating their own C++ application for a workplace situation/need, with the student also designing a user's manual to accompany the application.

This course is an excellent extension to what is learned in Computer Programming I, using Visual Basic computer programming language, another OOP language.



II. INSTRUCTIONAL TIME:

Class Periods: 180 days; 120 clock hours
Length of Class Periods (minutes): 42
Length of Course: One Full School Year
Unit of Credit: 1.00
Course Weight: 1.04

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.

Note: Standards and performance expectations listed in this curriculum is based on the National Business Education Standards (NBEA). As of the date of the curriculum writing, the PA Department of Education's standards for Business and Vocational Education have not been finalized.

The NBEA *Information Technology* Standards are cross-referenced with the PA *Science and Technology* Academic Standards in the curriculum.

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.

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.

NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS *(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful)☺*	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
PA ACADEMIC STANDARD & ASSESSMENT ANCHOR **3.6.12.C Analyze physical technologies of structural design, and engineering, personal relations, financial affairs, structural production, marketing, research and design to real world problems.** **3.7.12.C Evaluate computer operations and concepts as to their effectiveness to solve specific problems.** **3.7.12.D Evaluate the effectiveness of computer software to solve specific problems.**	3.6.12.C, 3.7.12.C, & 3.7.12.D -- I. Tutorial One: An Overview of a Microcomputer System and Programming Lesson A: An Introduction to Hardware and Software Objectives: • Describe the components of a microcomputer system • Explain the relationship between hardware and software • Understand the history of programming languages • Understand the terminology used in object-oriented languages	3.6.12.C, 3.7.12.C, & 3.7.12.D -- Students' questions, answers, and discussion during lesson/presentation.	3.6.12.C, 3.7.12.C, & 3.7.12.D – *Programming: An Introduction to Programming with C++,* by Diane Zak; Course Technology; 1998 Tutorial One A PPT Presentation & Guided Notes & Key Tutorial One A Instructor's Unit Handouts: OOP Terminology Tutorial One Outline

LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # II: Computer Architecture: Describe current and emerging computer architecture; configure, install, and upgrade hardware; diagnose and repair hardware problems.

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.
NBEA Information Technology Academic Content Standard # XVII: Information Technology Careers: Describe the positions and career paths in information technology.
NBEA Information Technology Academic Content Standard # VII: Information Retrieval: Gather, evaluate, use, and cite information from information technology sources

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS *(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful)☺*	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND MATERIALS
PA ACADEMIC STANDARD & ASSESSMENT ANCHOR **3.6.12.C Analyze physical technologies of structural design, and engineering, personal relations, financial affairs, structural production, marketing, research and design to real world problems.** **3.7.12.C Evaluate computer operations and concepts as to their effectiveness to solve specific problems.** **3.7.12.D Evaluate the effectiveness of computer software to solve specific problems.**	3.6.12.C, 3.7.12.C, & 3.7.12.D -- I. Tutorial Four: Built-in Functions and Programmer-defined Functions Lesson **B**: Value-returning Functions Objectives: • Create a function that returns a value • Format numeric output • Send output to a file	3.6.12.C, 3.7.12.C, & 3.7.12.D -- Students' questions, answers, and discussion during lesson/presentation.	3.6.12.C, 3.7.12.C, & 3.7.12.D – *Programming: An Introduction to Programming with C++,* by Diane Zak; Course Technology; 1998 Tutorial Four B PPT Presentation & Guided Notes & Key Tutorial Four B Instructor's Unit Handouts: C++ Keywords Chart C++ Data Types Chart C++ Functions Chart Tutorial Four Outline

LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.
NBEA Information Technology Academic Content Standard # VII: Information Retrieval: Gather, evaluate, use, and cite information from information technology sources
NBEA Information Technology Academic Content Standard # VI: Application Software: Identify, evaluate, select, install, use, upgrade, and customize application software; diagnose and solve problems resulting form an application software's installation and use.

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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PA ACADEMIC STANDARD & ASSESSMENT ANCHOR **3.6.12.C Analyze physical technologies of structural design, and engineering, personal relations, financial affairs, structural production, marketing, research and design to real world problems.** **3.7.12.C Evaluate computer operations and concepts as to their effectiveness to solve specific problems.** **3.7.12.D Evaluate the effectiveness of computer software to solve specific problems.**	3.6.12.C, 3.7.12.C, & 3.7.12.D -- I. Tutorial Eight: Arrays Lesson **B**: More on One-Dimensional Arrays Objectives: • Manipulate parallel arrays • Search an array • Store records in an array	3.6.12.C, 3.7.12.C, & 3.7.12.D -- Students' questions, answers, and discussion during lesson/presentation.	3.6.12.C, 3.7.12.C, & 3.7.12.D – *Programming: An Introduction to Programming with C++,* by Diane Zak; Course Technology; 1998 Tutorial Eight B PPT Presentation & Guided Notes & Key Tutorial Eight B Instructor's Unit Handouts: C++ Keywords Chart C++ Data Types Chart C++ Functions Chart One-Dimensional Array Learn Sheet – Part II Tutorial Eight Outline

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.

NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.
NBEA Information Technology Academic Content Standard # XV: Risk Management: Design and implement risk management policies and procedures for information technology.
NBEA Information Technology Academic Content Standard # VII: Information Retrieval: Gather, evaluate, use, and cite information from information technology sources
NBEA Information Technology Academic Content Standard # XVI: Privacy & Ethics: Describe, analyze, develop, and follow policies for managing privacy and ethical issues in organizations and in a technology-based society.

ESSENTIAL CONTENT PERFORMANCE STANDARD	CONTENT & INSTRUCTIONAL ACTIVITIES/STRATEGIES WITH CORRECTIVES AND EXTENSIONS *(individually created teaching activities may be used to achieve the standards; however, listed below are activities which may be helpful)☺*	ACTUAL LEVEL OF ATTAINMENT (EVALUATION CRITERIA) ASSESSMENT	RESOURCES AND 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.

NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.

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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.

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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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.

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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LEARNING STANDARDS AND CONTENT ACTIVITIES

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NBEA Information Technology Academic Content Standard # IX: Programming and Application Development: Design, develop, test, and implement programs.
NBEA Information Technology Academic Content Standard # XIV: Technical Support and Training: Develop the technical and interpersonal skills and knowledge to support the user community.
NBEA Information Technology Academic Content Standard # VII: Information Retrieval: Gather, evaluate, use, and cite information from information technology sources

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