Unit F: Early Classes and Objects

Content Area: **Business/Tech.**
Course(s): **Advance Placement Computer Science A - Java**
Time Period: **November**
Length: **10 days**
Status: **Published**

Unit Overview

In this unit, students will learn the about how classes and objects are structured in a program to help the programmer with their codes. Classes are considered the blueprints to programs.

- Classes

- Contructors

- Classes, Variables, and Scope

Enduring Understandings

- A Class defines a particular Object, while a Method is a coordinated sequence of instructions to be carried out by the Object or the World level in general.

- Students need to be able to correctly identify and class and objects for the easy code readibily and debugging.

Essential Questions

TEC.K-12.8.1.A.a	In a world of constant technological change, what skills should we learn?
TEC.K-12.8.1.A.b	How do I choose which technological tools to use and when it is appropriate to use them?
TEC.K-12.8.1.B.a	How can I transfer what I know to new technological situations/experiences?
TEC.K-12.8.1.B.b	What are my responsibilities for using technology? What constitutes misuse and how can it best be prevented?
TEC.K-12.8.2.B.a	How does technology extend human capabilities? What are the positive and negative consequences of technology? Should technologies that produce negative impact continue to be used?
TEC.K-12.8.2.B.b	When are the most sophisticated tools required and when are the simplest tools best?
TEC.K-12.8.2.C.a	Can a system continue to operate with a missing or malfunctioning component?

Lesson Titles/Objectives

- Classwork/Homework: Common object classes UML Diagram

- Homework: Chapter 5 Review and Exercises
- Lesson: Classes and Objects
- Lesson: Contuctors
- Program and UML: Car Class
- Program and UML: Pets
- Program and UML: Room Dimensions

Standards

TECH.8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
TECH.8.2.12.E.2	Analyze the relationships between internal and external computer components.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

Indicators

TECH.8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
TECH.8.2.12.E.2	Analyze the relationships between internal and external computer components.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

Career Readiness, Life Literacies, & Key Skills

12.9.3.IT-PRG.1	Analyze customer software needs and requirements.
12.9.3.IT-PRG.2	Demonstrate the use of industry standard strategies and project planning to meet customer specifications.
12.9.3.IT-PRG.3	Analyze system and software requirements to ensure maximum operating efficiency.
12.9.3.IT-PRG.4	Demonstrate the effective use of software development tools to develop software applications.
12.9.3.IT-PRG.5	Apply an appropriate software development process to design a software application.
12.9.3.IT-PRG.6	Program a computer application using the appropriate programming language.
12.9.3.IT-PRG.7	Demonstrate software testing procedures to ensure quality products.
12.9.3.IT-PRG.8	Perform quality assurance tasks as part of the software development cycle.
12.9.3.IT-PRG.10	Design, create and maintain a database.

TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

Inter-Disciplinary Connections

- Art
- English
- History
- Math
- Music
- Science

	Key Ideas and Details
	Craft and Structure
	Integration of Knowledge and Ideas
CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
SCI.9-12.5.1.12.A	Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.
SCI.9-12.5.1.12.A.a	Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.
SCI.9-12.5.1.12.B	Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
	The same solution techniques used to solve equations can be used to rearrange formulas. For example, the formula for the area of a trapezoid, ð˜ˆ = ((ð˜£â,+ð˜£â,,)/2)ð˜©, can be solved for ð˜© using the same deductive process.
	An equation is a statement of equality between two expressions, often viewed as a question asking for which values of the variables the expressions on either side are in fact equal. These values are the solutions to the equation. An identity, in contrast, is true for all values of the variables; identities are often developed by rewriting an expression in an equivalent form.
	A spreadsheet or a computer algebra system (CAS) can be used to experiment with algebraic expressions, perform complicated algebraic manipulations, and understand how algebraic manipulations behave.
	Algebraic manipulations are governed by the properties of operations and exponents, and the conventions of algebraic notation. At times, an expression is the result of applying operations to simpler expressions. For example, p + 0.05p is the sum of the simpler expressions p and 0.05p. Viewing an expression as the result of operation on simpler expressions can sometimes clarify its underlying structure.
	Reading an expression with comprehension involves analysis of its underlying structure.

This may suggest a different but equivalent way of writing the expression that exhibits some different aspect of its meaning. For example, p + 0.05p can be interpreted as the addition of a 5% tax to a price p. Rewriting p + 0.05p as 1.05p shows that adding a tax is the same as multiplying the price by a constant factor.

An expression is a record of a computation with numbers, symbols that represent numbers, arithmetic operations, exponentiation, and, at more advanced levels, the operation of evaluating a function. Conventions about the use of parentheses and the order of operations assure that each expression is unambiguous. Creating an expression that describes a computation involving a general quantity requires the ability to express the computation in general terms, abstracting from specific instances.

Warm-Up

- Students will enter room log onto computers and load appropriate program(s) for class

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Apply Concepts already Learned
- Critically Think
- Debug Programs
- Design Programs
- IS: • Extra Time to complete Programs
- IS: • NHS Assistance and Tutoring
- IS: • One on One tutoring during Delsea One
- Organize Code
- Recall Previous Terms

ELL Modifications

-
  - Choice of test format (multiple-choice, essay, true-false)
  - Continue practicing vocabulary
  - Provide study guides prior to tests
  - Read directions to the student
  - Read test passages aloud (for comprehension assessment)
  - Vary test formats

IEP & 504 Modifications

- Allow for redos/retakes .
- Assign fewer problems at one time (e.g., assign only odds or evens) .
- Differentiated center-based small group instruction .

- Extra time on assessments .
- Highlight key directions .
- If a manipulative is used during instruction, allow its use on a test .
- Opportunities for cooperative partner work .
- Provide reteach pages if necessary .
- Provide several ways to solve a problem if possible .
- Provide visual aids and anchor charts .
- Test in alternative site .
- Tiered lessons and assignments .
- Use of a graphic organizer .
- Use of concrete materials and objects (manipulatives) .
- Use of word processor .

G&T Modifications

-
  - Alternate assignments/enrichment assignments
  - Enrichment projects
  - Extension activities
  - Higher-level cooperative learning activities
  - Pairing direct instruction with coaching to promote self-directed learning
  - Provide higher-order questioning and discussion opportunities
  - Provide texts at a higher reading level
  - Tiered assignments
  - Tiered centers

At Risk Modifications

- Additional time for assignments
- Adjusted assignment timelines
- Agenda book and checklists
- Answers to be dictated
- Assistance in maintaining uncluttered space
- Books on tape
- Concrete examples
- Extra visual and verbal cues and prompts
- Follow a routine/schedule
- Graphic organizers
- Have students restate information

- No penalty for spelling errors or sloppy handwriting
- Peer or scribe note-taking
- Personalized examples
- Preferential seating
- Provision of notes or outlines
- Reduction of distractions
- Review of directions
- Review sessions
- Space for movement or breaks
- Support auditory presentations with visuals
- Teach time management skills
- Use of a study carrel
- Use of mnemonics
- Varied reinforcement procedures
- Work in progress check

Alternative Assessment

Performance tasks
Project-based assignments
Problem-based assignments
Presentations
Reflective pieces
Concept maps
Case-based scenarios
Portfolios

Benchmark Assessment

Skills-based assessment
Reading response
Writing prompt
Lab practical

Formative Assessment

- Load and Save Programs
- Prepare Workstations

Summative Assessment

- Quiz: Simple Class and UML
- Test: Early Classes

Technology

- ClearTouch
- Computer
- Eclipse IDE
- Google Classroom
- Google Docs
- Internet

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.CS1	Understand and use technology systems.

Resources & Materials

- College Board. AP Case Study Materials
- Eclipse IDE
- Internet
- Microsoft Office
- Student Handout
- Tony Gaddis: Starting Out with Java: Early Objects. 4/E., 2010, Pearson