

Unit D: Control Structures: If, If/Then and Switches

Content Area: **Business/Tech.**
Course(s): **Advance Placement Computer Science A - Java**
Time Period: **October**
Length: **2 week**
Status: **Published**

Unit Overview

In this unit students will start using some of the control structures in program. This unit will cover the following topics:

- If Statements
- If/Else Statements
- If/Else/If Statements
- Switch Statements
- Logical Operators
- Conditional Operators
- Random Class
- Formatting Numbers

Enduring Understandings

- Students should understand the difference of a selection structure as opposed to to a sequential program structure and when to use each kind.
- Decision statements are important in any critical thinking process, trying to understand when a programmer will use the each one is equally important.

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

- Activity: Comparisons of Control Structures
- Homework: Chapter 4 Review Questions and Exercises
- Lesson: Logical and Conditional Operators
- Lesson: Selection Control Structures
- Program: Advanced Grade Program
- Program: Magic Date
- Program: Rock Paper Scissors
- Program: Roman Numerals
- Program: Shipping Company
- Program: Switch Grade Program
- Program: Test Scores and Grades

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

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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.9	Perform software maintenance and customer support functions.
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).

Inter-Disciplinary Connections

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

LA.RST.11-12	Integration of Knowledge and Ideas
	Reading Science and Technical Subjects
	Key Ideas and Details
	Integration of Knowledge and Ideas
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
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.B	Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
	Expressions.
	Equations and Inequalities.
	Connections to Functions and Modeling.

Warm-Up

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

Anticipatory Set

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

- IS: • Extra Time to complete Programs
- Apply Concepts Previously Learned
- Create Programs
- Critically Think through problems
- Debug Programs
- Design Psuedocode
- IS: • NHS Assistance and Tutoring
- IS: • One on One tutoring during Delsea One
- Organize through topics
- Recall Previous lessons

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: Logical and Conditional Operators
- Test: Decision Structures, Conditional Operators, Logical Operators

Resources & Materials

- College Board. AP GridWorld Case Study. New York: College Entrance Examination Board, 2006.
- Computer
- Eclipse IDE
- Internet
- Lynda.com
- Microsoft Office
- Student Handout
- Tony Gaddis: Starting Out with Java: Early Objects. 4/E., 2010, Pearson

Technology

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

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.12.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.12.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.2.12.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.12.B	Technology and Society: Knowledge and understanding of human, cultural and society values are fundamental when designing technology systems and products in the global society.
TECH.8.2.12.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.12.D	Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

TECH.8.2.12.E

Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.