Unit P: Final Project

Content Area: **Business/Tech.**
Course(s): **Advance Placement Computer Science A - Java**
Time Period: **May**
Length: **15 days**
Status: **Published**

Unit Overview

The Final Project by the students will challenge the students to create a program for a teacher that will aid in the education process in their classroom.

Enduring Understandings

- Students will create a program that they feel utilized their learned skills.

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

- Program: Student Created Program

Standards

LA.11-12.CCSS.ELA-Literacy.CCRA.R.1	Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
LA.11-12.CCSS.ELA-Literacy.CCRA.R.2	Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

LA.11-12.CCSS.ELA-Literacy.CCRA.R.4	Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
TEC.9-12.8.1	All students will use computer applications to gather and organize information and to solve problems.
TEC.9-12.8.1.12	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.
TEC.9-12.8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the individual, society, and the environment.
TEC.9-12.8.2.12	All students will develop an understanding of the nature and impact of technology, engineering, technological design and the designed world as they relate to the individual, global society, and the environment.
CCSS.ELA-Literacy.RST.11-12.2	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
CCSS.ELA-Literacy.RST.11-12.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
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

TEC.9-12.8.1.12.A.1	Construct a spreadsheet, enter data, and use mathematical or logical functions to manipulate data, generate charts and graphs and interpret the results.
TEC.9-12.8.1.12.A.3	Participate in online courses, learning communities, social networks or a virtual world as resources for lifelong learning.
TEC.9-12.8.1.12.B.1	Design and pilot a digital learning game to demonstrate knowledge and skills related to one or more content areas or a real world situation.
TEC.9-12.8.1.12.D.1	Evaluate policies on unauthorized electronic access (hacking) and disclosure, and dissemination of personal information.
TEC.9-12.8.1.12.D.2	Demonstrate appropriate use of copyrights, fair use and creative commons.
TEC.9-12.8.1.12.D.3	Compare and contrast international government policies on filters for censorship.
TEC.9-12.8.1.12.D.4	Explain the impact of cyber crimes on society.
TEC.9-12.8.1.12.E.2	Predict the impact on society of unethical use of digital tools based on research with peers and experts in the field.
TEC.9-12.8.2.12.A.1	Design and create a technology product or system that improves the quality of life and identify trade-offs, risks and benefits.

TEC.9-12.8.2.12.B.1	Design and create a product that maximizes conservation and sustainability of a scarce resource by using the design process and entrepreneurial skills.
TEC.9-12.8.2.12.B.2	Design and create a prototype for solving a global problem, documenting how the proposed design features affect the feasibility of the prototype through the use of engineering, drawing and other technical methods of illustration.
TEC.9-12.8.2.12.B.3	Analyze the full costs, benefits, trade-offs and risks related to the use of technologies in a potential career path.
TEC.9-12.8.2.12.C.2	Evaluate the ethical considerations regarding resources used for the design, creation, maintenance and sustainability of a chosen product.
TEC.9-12.8.2.12.C.3	Evaluate the positive and negative impacts in a design by providing a digital overview of a chosen product and address the negative impacts.
TEC.9-12.8.2.12.C.3	Evaluate the positive and negative impacts in a design by providing a digital overview of a chosen product and suggest potential modifications to address the negative impacts.
TEC.9-12.8.2.12.D.1	Reverse engineer a product to assist in designing a more eco-friendly version guided by an analysis of trends and data about renewable and sustainable materials.
TEC.9-12.8.2.12.E.1	Devise a technological product or system, addressing a global issue, using the design process and provide documentation through drawings, data and materials that reflect diverse cultural perspectives.
TEC.9-12.8.2.12.E.1	Use the design process to devise a technological product or system that addresses a global issue, and provide documentation through drawings, data, and materials, taking the relevant cultural perspectives into account throughout the design and development process.
TEC.9-12.8.2.12.F.1	Determine and use the appropriate application of resources in the design, development, and creation of a technological product or system.
TEC.9-12.8.2.12.F.2	Explain how material science impacts the quality of products.
TEC.9-12.8.2.12.F.3	Select and utilize resources that have been modified by digital tools in the creation of a technological product or system (CNC equipment, CAD software).
TEC.9-12.8.2.12.G.1	Analyze the interactions among various technologies and collaborate to create a product or system demonstrating their interactivity.
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.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).
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.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.
SCI.HS-ETS1	Engineering Design
	Connections to Functions and Modeling.
	Equations and Inequalities.
	Expressions.

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 previously Learned
- Create Programs
- Critically Think
- Debug code
- Design programs
- IS: • Extra Time to complete Programs
- IS: • NHS Assistance and Tutoring
- IS: • One on One tutoring during Delsea One
- Organize Code
- Team up with partners

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 Assessments

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

Benchmark Assessments

Skills-based assessment
Reading response
Writing prompt
Lab practical

Formative Assessment

- Load and Save Programs
- Prepare Workstation

Summative Assessment

- Program: Student Created Program

Resources & Materials

- College Board. AP Case Study Materials

- Computer
- Eclipse IDE
- Internet
- Microsoft Office
- 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.