

# Unit 5: Designing the User Experience

Content Area: **Computer Science**  
Course(s):  
Time Period: **Marking Period 1**  
Length: **4-5 Weeks**  
Status: **Published**

## Standards

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Students will learn to design an interactive program that takes input from the user in a graphical user interface that the student has designed, and has outputs based on user feedback. The students develop a plan for giving instructions, starting the program, interaction, difficulty and ending conditions. The use of arrays in order to keep track of objects, scores, etc. will incorporate array operations, searching and sorting.

Revised October 2020

Diversity and Inclusion: Students will focus on equity, inclusion, and tolerance when analyzing the comparison of various quantities regarding characteristics of people. Equality will also be highlighted through the topic of citizenship. This can be associated with treating people fairly and equally.

Designing products through an inclusive fashion will include information about various people and their culture/history. This addresses the following:

### Amistad Commission

This unit also reflects the goals of the Department of Education and the Amistad Commission including the infusion of the history of Africans and African-Americans into the curriculum in order to provide an accurate, complete, and inclusive history regarding the importance of African-Americans to the growth and development of American society in a global context.

### Asian American and Pacific Islander History Law

This unit includes instructional materials that highlight the history and contributions of Asian Americans and Pacific Islanders in accordance with the New Jersey Student Learning Standards in Social Studies.

### New Jersey Diversity and Inclusion Law

In accordance with New Jersey's Chapter 32 Diversity and Inclusion Law, this unit includes instructional materials that highlight and promote diversity, including:

economic diversity, equity, inclusion, tolerance, and belonging in connection with gender and

sexual orientation, race and ethnicity, disabilities, and religious tolerance.

CS.9-12.8.1.12.AP.7	Collaboratively design and develop programs and artifacts for broad audiences by incorporating feedback from users.
CS.9-12.8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
CS.9-12.8.1.12.NI.3	Explain how the needs of users and the sensitivity of data determine the level of security implemented.
LA.K-12.NJSLSA.L4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
LA.K-12.NJSLSA.L5	Demonstrate understanding of word relationships and nuances in word meanings.
MA.9-12.1.2.12prof.Cr	Creating
MA.9-12.1.2.12prof.Cr2	Organizing and developing ideas.
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).

## **Essential Questions / Enduring Understandings**

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Essential Questions:

- What is the process that developers go through when designing a program?
- How do you initialize all variables at the beginning of the program so they are usable when you need them?
- How will you allow the user to control objects? How will you tell your user?
- How will you keep track of changes to values within the program?
- How do you keep track of past results?
- How will the user know the program is over?

Enduring Understandings:

- Planning the entirety of the program before beginning will ease the process.
- Developing programs have many levels of involvement.
- Testing parts of the program's code is a faster process than testing it all at once.

## Objectives

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Students will know:

- the built-in data types of a computer language, including its declaration, definition, parameters and operations.
- how to write programs using sequential control, conditional control.
- how to write code that handles errors in a friendly manner.
- how to keep track of data in arrays.
- how to use random number generators.

Students will be skilled at:

- communicating with the user to set clear instructions.
- gathering feedback from the user.

## Learning Plan

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- Preview the essential questions and connect to learning throughout the unit.
- Discussion on different types of programs and game genres.
- Discussion on structure of a full program.
- Review user control.
- Plan instructions, controls, levels, and ending event.
- Plan variable names and types.
- Develop each subtask, testing them separately to ensure they are working individually.
- Combine subtasks, self test program
- Peer Review
- Use feedback to make modifications.

## Assessment

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- Assessments
  - Formative: Daily assessments using examples from class notes and CodeHS.com, AP Classroom/Albert Checks for Understanding
  - Summative: Teacher-created assessments/projects and CodeHS Computer Science Projects, AP

## Classroom/Albert Unit Assessments

- Benchmark: Check for understanding benchmark assessments on CodeHS, AP Classroom/Albert/Khan Academy Diagnostics
- Alternative Assessments: Student-centered activities such as a doorbell coding project, game design projects, and other activities involving real world applications
- Complete the performance task of designing a user interface that will respond to the user's input.
- Be observed by the teacher during individual work on the performance task.
- Conduct self-assessments and reflections
- Conduct peer evaluations
- Participate in class discussions

## Materials

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- Core instructional materials: [Core Book List](#)

Supplemental materials: CodeHS

- Computer
- Reference books

## Integrated Accommodations and Modifications

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See [Linked Document](#).