03_Unit 3 Animation and Games

Content Area: **Math**
Course(s):
Time Period: **Cycle**
Length: **7 lessons (22 lesson marking period cycle; 1 of 3 units)**
Status: **Published**

General Overview, Course Description or Course Philosophy

Computer Programming 7

Computer science and design thinking education prepares students to succeed in today's knowledge-based economy by providing equitable and expanded access to high-quality, standards-based computer science and technological design education. During 7th grade, students will focus on the core ideas of computing systems, networks, impacts of computing and data analysis, programming, engineering design, ethics and culture of technology, and the interaction and effects of technology with and on humans and the natural world. They do so by completing three specific units entitled "Problem Solving and Computing", "Web Development", and "Interactive Animation and Games".

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Unit Summary:

Algorithms (sequences of steps designed to accomplish a specific task) are translated into programs, or code, to provide instructions for computing devices. Algorithms and programming control all computing systems, empowering people to communicate with the world in new, creative ways and solve compelling problems. Ethics and culture concerns the profound effects that technologies have on people, how those effects can widen or narrow disparities, and the responsibility that people have for the societal consequences of their technological decisions.

Essential Question(s):

- How can computer programming and algorithms be used to create websites, games, animations, and interactive art?
- What ethical responsibilities should be acknowledged and considered when creating websites, games, animations, and interactive art?

Enduring Understandings:

- Individuals design algorithms that are reusable in many situations and are able to be tested and debugged.
- Programmers create variables to store data values of different types and perform appropriate operations on their values.
- Programs use procedures to organize code and create games, websites, and animation/games.
- Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community.
- Technological disparities have consequences for public health and prosperity.

CONTENT AREA STANDARDS

CS.6-8.8.1.8.AP.1	Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.
CS.6-8.8.1.8.AP.3	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
CS.6-8.8.1.8.AP.5	Create procedures with parameters to organize code and make it easier to reuse.
CS.6-8.8.2.8.EC.1	Explain ethical issues that may arise from the use of new technologies.
CS.6-8.8.2.8.EC.2	Examine the effects of ethical and unethical practices in product design and development.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

LA.RI.7.10	By the end of the year read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed.
LA.L.7.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

TECH.9.4.2.CT.3 Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge sections.

Declarative Knowledge

Students will understand that:

- Programming is a form of communication.
- Programming allows the user to find enjoyment in expressing creativity in an applied science course of study.
- Algorithms in computer programming can be created and followed geared toward the interest of the user.
- Computer programs can be edited, refined, tested, and debugged.
- Computer programmers need to understand the ethical responsibilities in their careers and take users' needs into consideration.

Procedural Knowledge

Students will be able to:

- Create images, animations, interactive art, and games using code and algorithms.
- Design, test, and debug programs.
- Identify ethical concerns related to computer programming in creating images, animations, interactive art, and games.
- Explain the needs of the user and how culture, environment, and the economy impact technology.

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

For this unit, formative assessments may include:

- observation
- one-on-one assistance
- questioning skills
- graphic organizers
- anecdotal notes
- exit tickets
- student interviews and check-ins

Summative Assessments

For this unit, summative assessments may include:

- graphic organizers
- homework, when applicable
- mini projects at the end of units
- culminating activities in the code.org units

RESOURCES (Instructional, Supplemental, Intervention Materials)

Code.org Website

All lessons and resources can be accessed via this website.

INTERDISCIPLINARY CONNECTIONS

English/Language Arts - implementation of conventions of Standard English

Technology/Multi-Media - audio/visual media analysis

Math - computations

Visual and Performing Arts- presentations on app lab and website design

Social Studies - ethical codes of components of technology

Science- computer science, physics

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.