

# STRANDS AND STANDARDS

## GAME DEVELOPMENT FUNDAMENTALS 1



### Course Description

This course is designed to provide students with knowledge and project-based experience of fundamental gaming development concepts relating to STEM. These concepts include game design, scripting, creation of digital assets, graphic resources, animations, understanding hardware, problem solving, critical thinking, collaboration, and project management.

<b>Intended Grade Level</b>	9-12
Units of Credit	0.5
Core Code	35.02.00.00.045
Concurrent Enrollment Core Code	35.02.00.13.045
Prerequisite or	Intro to Graphics Communication or
Prerequisite or	Digital Graphic Art Intro
Prerequisite or	Digital Media 1
Prerequisite	Computer Programming 1 (suggested)
Skill Certification Test Number	896
Test Weight	0.5
<b>License Type</b>	CTE and/or Secondary Education 6-12
<b>Required Endorsement(s)</b>	
Endorsement 1 or	Intro to Computer Science
Endorsement 2 or	Programming & Software Development
Endorsement 3	Multimedia

## STRAND 1

**Video Game History (7% -4 of 54 pts): Students will understand the relevant history of video games.**

### Standard 1

Relevant History—The student will be able to discuss the history of gaming including; arcade, console, computer, mobile, and modern devices.

- Identify key figures and designers in the history of gaming (Ralph Baer/father of video games, Nolan Bushnell/founder of Atari, Shigeru Miyamoto/key figure in Nintendo, etc.)
- Identify early games (Pong, Pac-Man, Donkey Kong, Space Invaders, Centipede, Missile Command, Asteroids, etc.)
- Understand important milestones in gaming (why gaming boomed or dwindled over the years, Golden age of arcade video games, the North American Video Game crash of 1983, etc.)
- Console Wars—Generations of Consoles (Nintendo, Sony, Microsoft, Sega, etc.)

### Standard 2

Game Ratings—Students will be familiar with the ESRB (Entertainment Software Rating Board) and its ratings categories:

- eC—Early Childhood
- E—Everyone
- E 10+—Everyone 10 and up
- T—Teen
- M—Mature
- AO—Adults Only
- RP—Rating Pending

### Standard 3

Impact and Evolution of Gaming—Students will explore the evolution of pc / arcade / console gaming to online gaming and its societal impact.

- Explain how social gaming has evolved from meeting at a physical location to online groups. (Arcade, sleepovers, online party gaming, etc.)
- Understand the economic impacts of the Video Game industry. (physical to digital distribution, evolution of advertising, growth of gaming industry, etc.)
- Understand the impact of gaming in other industries. (Health, education, military simulations, etc.)

## Performance Skills

- Understand relevant video game history.
- Understand game ratings.
- Understand gaming evolution.

## STRAND 2

**Communication Features and Game Interface Design (15% -8 of 54 pts): Students will be able to apply communication features and game interface design.**

### Standard 1

Game Strategy & Feedback --Students will understand what it means to design a game strategy and provide game feedback.

- Identify game strategies -Victory / Loss conditions (high score, fastest time, most levels, % indicator, end of story)
- Identify Player Motivation (Bartle's Four Types of Gamers – socializers, achievers, explorers, and "griefer")
- Identify the feedback needed for progress in the game (defeating enemies, earning points, reducing health, specific sounds, winning screen, points earned, life lost, etc.)
- Understand duration (levels, time, rooms, lives, etc.)

### Standard 2

Game Control—Students will understand the design of game control concepts.

- Understand design functionality (determine what to include in the game with regard to movements, power-ups, jumping, avoiding obstacles, collecting, etc.)
- Create usability in game control (implement the ability for the player to change movements, switching views, etc.)
- Describe accessibility (refers to what is used to play the game -- keyboard and mouse, joystick, game controller, touch screen, motion control/gyroscope, etc.)
- Understand immersion (feeling part of the game, emotions, etc.)

### Standard 3

Design Aesthetics -- Students will understand the aesthetics of game design, and its importance in creating an immersive experience.

- Design of World/Background (dark and gloomy, 8-bit art, photorealistic graphics, parallax, etc.)
- Player View -- Students will understand the importance of "Player View" in game design, understanding the many view options:
  - Two-Dimensional (flat, 2D-world, platform games are usually 2Dgames)
  - Isometric (3/4 perspective)
  - First-Person (from the character's point of view -- you don't see the character)

# GAME DEVELOPMENT FUNDAMENTALS 1

- Third Person (view from behind the character -- you see the character -- often an over the shoulder view)
- Top-Down (looking down from the top -- you usually see the character)

## Standard 4

Interface Elements—Students will understand the difference between diegetic and non-diegetic elements.

- Understand diegetic elements (elements that come from the world in the game -- sounds, graphics, etc.)
- Understand non-diegetic elements (in the game but added on top of the world - health bar, score, narration, etc.)

## Performance Skills

- Understand game design functionally and feedback.
- Understand game design control, player view, and interface elements.

## STRAND 3

**Game Platforms (7% - 4 of 54 pts): Students will be able to identify various gaming platforms, understand their impacts, and develop at least one game on one of those platforms.**

### Standard 1

Identify different game platforms: Console, Desktop/Laptop Computer, and Mobile Device.

- Consoles
  - Atari (2600, Lynx, etc.)
  - Nintendo (NES, Gameboy, SNES, DS, Wii, Switch, etc.)
  - Sony (PS series, PS Vita, PSP, etc.)
  - Microsoft (Xbox series – Xbox, 360, One)
  - Sega (Master System, Genesis, Sega-CD, Game gear, Dreamcast, etc.)
  - Other (Neo Geo, Turbo Grafx 16, Arcade Cabinet, etc.)
- Desktop/Laptop Computer
  - Windows
  - Mac OS
  - Linux
- Mobile Devices
  - iOS
  - Android

### Standard 2

Identify considerations (strengths and weaknesses) when developing for a particular platform, or multiple platforms. Examples are:

- Display size
- Hardware (performance, graphics, storage, etc.)
- Input method

- Portability
- Affordability

## Standard 3

Understand impact of cloud computing and processing on game design. Examples include:

- Broad distribution channel
- Updates without user involvement
- Dependence on internet connectivity
- System dependence on publisher hardware

## Standard 4

Identify different distribution channels: Physical media, Digital download (Minecraft, League of Legends, etc), Steam, Epic Game Store, Apple Arcade, Console-specific Digital Distribution (Xbox Live, Playstation Network, etc.)

## Performance Skills

- Describe game consoles, platforms.
- Identify different mobile platforms.
- Understand impacts of distribution and media format.

## STRAND 4

**Game Genres and Types (13% - 7 of 54 pts): Students will define various game genres and types.**

### Standard 1

Game Genres—Students will be able to identify the following game genre categories (categories of games based on challenges):

- Action (includes physical challenges)
- Adventure (focuses on an interactive story)
- Role Playing Game/RPG (player undertakes a quest in a fictional world)
- Simulation (used to simulate a real setting)
- Strategy (decision making/skillful thinking and planning)
- Hybrid (combination of 2 or more above genres)

### Standard 2

Game Types—Students will be able to identify the following game types:

- Single-player (player vs. the situation)
- Two-player (player vs. another player)
- Multiplayer competitive (every player for themselves - against each other)
- Multiplayer cooperative (all of us in this together to defeat the enemy)
- Team-based (our team vs. their team, each team controlled by one or many players)

## Performance Skills

- Identify and understand different game genres and game types.

## STRAND 5

**Game Design Production Cycle (54% -29 of 54 pts): Students will be able to create and develop a game, in one of the identified game genres (Action, Adventure, RPG, Simulation or Strategy), using the Game Design Production Cycle.**

### Standard 1

Game Concept Development—Students will be able to work alone and / or in a team (designer, programmer, project manager, graphic artist, etc.) to develop a game concept.

- Develop a concept with considerations for plan, cost, and time.
- Create a game proposal "Pitch Document" (components include: goal, characters, environment, obstacles, platform)
- Create storyboard
- Sketch and plan characters (protagonist, antagonist)

### Standard 2

Pre-Production (Design)—Students will be able to design documents as part of the Preproduction of the game.

- Put together a "Game Design Document" (the overall blueprint) and include the following components:
  - Title
  - Genre (Action, Adventure, Role Playing Game/RPG, Simulation/fictional reality, Strategy/decision making)
  - Game type (Single-player: player vs. the situation, Two-player: player vs. another player, Multiplayer competitive: every player for themselves -against each other, Multiplayer cooperative: all of us in this together to defeat the enemy, Team-based: our team vs. their team, each team controlled by one or many players)
  - Brief description (short text on back of game box to entice gamers to purchase)
  - Rules of the game
  - Design of levels and rooms
  - Script (what the characters are going to say, dialogue, etc.)
  - Game mechanics (the challenges presented to the player and the actions the player is permitted to take)
  - Game goals (what it takes to win or lose the game)
  - Select which platform the game will be developed for.
  - Select a game engine (possible engines: Scratch, , Unity, , GameMaker, Game Salad, Unreal, Godot, etc.)

## Standard 3

Production (Create)—Students will be able to create assets and incorporate them in a game.

- Create art and text
- Develop sounds for the game
- Implement scripting as needed
- Create game animations
- Design the User Interface/UI components (could include inventory, score, health bar, lives, navigation, powerbar, text indicators, maps, level, sound on/off, etc.)
- Create an analog or digital prototype version of a game

## Standard 4

Post-Production (Game Testing and Release)—Students will understand and explain the process of game testing and release the game after it has been developed.

- Alpha Testing (in-house/controlled, small group testing to find and repair bugs and glitches, make needed adjustments)
- Beta Testing (outside, large group testing to receive feedback from selected end users, make needed adjustments and repairs that were not discovered in-house)
- Game Release (game is open for playing)
- Game Maintenance (provide updates, repair more identified bugs and glitches)

## Performance Skills

- Implement project management as part of the game design production cycle.
- Create and develop a game concept.
- Design and create the documents needed in the pre-production(design) of a game.
- Create the assets and incorporate them in a game.
- Explain alpha and beta testing processes of a game.

## STRAND 6

**Understanding Careers (4% -2 of 54 pts): Students will explore careers and training in the game design and production world.**

### Standard 1

Career Awareness—Students will develop career awareness related to working in the gaming industry.

- Identify personal interests and abilities related to game development, such as:
  - Identify personal creative talents
  - Identify organizational and leadership skills
  - Identify special interest areas
- Identify the primary game development job titles, such as: Lead Programmer, Lead Designer, General Game Designer, Mechanics Designer, Level Designer/World

# GAME DEVELOPMENT FUNDAMENTALS 1

Builder, User Interface (UI) Designer, Animator, Writer, Audio Director, Art Director, Project Manager, etc.

- Investigate career opportunities, trends, and requirements related to game development careers.

## Standard 2

Educational Pursuits—Students will develop a realistic plan for College and Career Readiness to help guide further educational pursuits.

- Identify factors for employability and advancement in the game industry.
- Research existing game development studios to determine what training is required.
- Research universities and colleges to determine programs, degrees and training availability.
- Develop employability competencies/characteristics: responsibility, dependability, ethics, respect, and cooperation.

## Performance Skills

- Understand careers related to the gaming industry.
- Understand paths of skills development through ongoing education or industry experience.

## Workplace Skills

- Communication
- Problem Solving
- Teamwork
- Critical Thinking
- Dependability
- Accountability
- Legal Requirements/Expectations

## Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		
Game Development Fundamentals 1	896	4	10	7	7	18	3					49	30