

# Game Development Fundamentals 1

| Exam Information                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                               |
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| <b>Exam number</b><br><b>896</b><br><br><b>Items</b><br><b>30</b><br><br><b>National Career Cluster</b><br><b>Information Technology</b><br><br><b>Certification available</b><br><b>Yes</b> | <p>The Game Development Fundamentals industry certification exam assesses learners' knowledge and project-based experience of fundamental game development concepts relating to STEM. Concepts assessed include game design, scripting, creation of digital assets, graphic resources, animations, understanding hardware, problem solving, critical thinking, collaboration, and project management.</p> |

## Exam Blueprint and Performance Skills

| Standard                                            | Percentage of exam score |
|-----------------------------------------------------|--------------------------|
| 1. Video Game History                               | 12%                      |
| 2. Communication Features And Game Interface Design | 20%                      |
| 3. Game Platforms                                   | 10%                      |
| 4. Game Genres And Types                            | 10%                      |
| 5. Game Design Production Cycle                     | 41%                      |
| 6. Understanding Careers                            | 6%                       |

\*Includes performance skill evaluation

## Standard 1 - Video Game History

Candidates will understand the relevant history of video games.

**Objective 1** Relevant History – The candidate will be able to discuss the history of the gaming industry including: key figures, early games, devices, and milestones.

1. 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.)
2. Identify early games (Pong, Pac-Man, Donkey-Kong, Space Invaders, Centipede, Missile Command, Asteroids, etc.)
3. Identify impactful gaming devices, important milestones in gaming (such as arcade cabinet, Atari 2600, NES (Nintendo Entertainment System), Gameboy, Sega Genesis, Playstation (the original), XBox (the original), and Wii)
4. Understand important milestones in game history: Golden age of arcade video games, the North American Video Game crash of 1983, and The Console Wars
5. Generations of consoles (Nintendo, Sony, Microsoft, and Sega)

**Objective 2** Game Ratings – Candidates will be familiar with the ESRB (Entertainment Software Rating Board) and its ratings categories:

1. E – Everyone
2. E 10+ - Everyone 10 and up
3. T – Teen
4. M – Mature
5. RP – Rating Pending

**Objective 3** Impact and Evolution of the Game Industry —Candidates will explore how games impacted society and the economy.

1. Explain how social gaming has evolved from meeting at a physical location to online groups (arcade, split screen (local multiplayer), LAN party, and online gaming).
2. Understand the economic impacts of the Video Game industry. (Physical to digital distribution, evolution of advertising, growth of gaming industry)
3. Understand the impact of gaming in other industries. (Health, education, military simulations, and film)

**Optional: Standard performance evaluations on the final page of this document**

## **Standard 2 - Communication Features And Game Interface Design**

Candidates will be able to understand basic game design, user experience, and user interface concepts.

**Objective 1** Basic Game Design --Candidates will understand the fundamentals of basic game design.

1. Identify victory / loss conditions (high score, fastest time, most levels, % indicator, end of story)
2. Identify in-game feedback for progress in the game (defeating enemies, earning points, collectibles, reducing health, sound effects, win screen, life lost)
3. Understand duration (levels, time, rooms, lives)
4. Understand design functionality (movements, power-ups, jumping, avoiding obstacles, collecting, collision)
5. Visual design of world/background (pixel art, photorealistic graphics, parallax, cel shaded)

**Objective 2** User Experience (UX) and Psychology – Candidates will understand how players experience games

1. Input Devices (keyboard and mouse, joystick, game controller, touch screen, motion control/gyroscope)
2. Understand basic accessibility (text to speech, customizable controls, subtitles)
3. Identify target demographic and player motivation (such as Bartle's Four Types of Gamers: socializers, achievers, explorers, and "griefers")
4. Understand immersion & the Flow State (feeling part of the game, emotions)

**Objective 3** User Interface (UI) -- Candidates will understand interface elements and player view options.

1. Interface Elements (understand the classification of visual components)
2. Diegetic elements (elements that come from the world in the game -- sounds, graphics)

3. Non-diegetic elements (in the game but added on top of the world - health bar, score, narration)
4. Player view options in game design:
  - a. Two-Dimensional (eg classic platformer games)
  - b. Isometric (3/4 perspective)
  - c. Top-Down (looking down from the top -- you usually see the character)
  - d. First-Person (from the character's point of view -- you don't see the character)
  - e. Third Person (view from behind the character -- you see the character -- often an over the shoulder view)

## Standard 3 - Game Platforms

Candidates will be able to identify various gaming platforms, understand their impacts, and develop at least one game on one of those platforms.

**Objective 1** Identify different game platforms: Console, Desktop/Laptop Computer, and Mobile Device.

1. Consoles
  - a. Nintendo (Switch)
  - b. Sony (PS series)
  - c. Microsoft (Xbox series)
  - d. Valve (Stream Deck)
2. Desktop/Laptop Computer
  - a. Windows
  - b. Mac OS
  - c. Linux
3. Mobile Devices
  - a. iOS
  - b. Android

**Objective 2** Identify considerations (strengths and weaknesses) when developing for a particular platform, or multiple platforms. Examples are:

1. Display size
2. Hardware (performance, graphics, storage, etc.)
3. Input method
4. Portability
5. Affordability

**Objective 3** Distribution Channels - Candidates will Identify different distribution channels:

1. Physical media
2. Digital download (Minecraft, League of Legends)
3. Steam
4. Itch.io (Indie game publishing)
5. Epic Game Store
6. Apple Arcade
7. Console-specific (Xbox Live, Playstation Network, Nintendo eShop)

## Standard 4 - Game Genres And Types

Candidates will define various games genres and types.

**Objective 1** Game Genres – Candidates will be able to identify the following game genre categories:

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

**Objective 2** Game Types – Candidates will be able to identify the following game types:

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

## Standard 5 - Game Design Production Cycle

Candidates will be able to create and develop a game, in one of the identified game genres (Action, Adventure, RPG (Role Playing Game), Simulation or Strategy), using the Game Development Production Pipeline.

**Objective 1** Game Concept Development – Candidates will be able to work alone and / or in a team (designer, programmer, project manager, graphic artist, etc.) to develop a game concept.

1. Develop a concept with considerations for a plan, cost(not a budget, but cost to candidate and time outside of class), and time to completion.
2. Create a game proposal “Pitch Document” components include:
  - a. goal
  - b. characters (protagonist, antagonist)
  - c. environment
  - d. obstacles
  - e. platform
  - f. storyboard sketch

**Objective 2** Pre-Production (Design) – Candidates will be able to design documents as part of the Preproduction of the game.

1. Put together a “Game Design Document” (the overall blueprint) and include the following components:
  - a. Title
  - b. Genre (Action, Adventure, Role Playing Game/RPG, Simulation/fictional reality, Strategy/decision making)
  - c. 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)
  - d. Brief description (short text on back of game box to entice gamers to purchase)
  - e. Design of levels and rooms
  - f. Storyline (narrative - how the story is structured)
  - g. Dialogue (what the characters are going to say)
  - h. Game Mechanics (the challenges presented to the player and the actions

the player is permitted to take)

- i. Goals/rules (what it takes to win or lose the game)
- j. Select which platform the game will be developed for.
- k. Select a game engine (possible engines: Scratch, Unity, GameMaker, Game Salad, Unreal, Godot)

**Objective 3** Production (Create) – Candidates will be able to create assets and incorporate them in a game.

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

**Objective 4** Post-Production (Game Testing and Release) –Candidates will explain the process of game testing and release the game after it has been developed.

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

## Standard 6 - Understanding Careers

Candidates will explore careers and training in the game design and production world.

**Objective 1** Career Awareness –Candidates will develop career awareness related to working in the gaming industry.

1. Identify personal interests and abilities related to game development, such as:
  - a. Identify personal creative talents
  - b. Identify organizational and leadership skills
  - c. Identify special interest areas

2. Identify the primary game development job titles, such as:
  - a. Programmer
  - b. Game Designer
  - c. Audio Director
  - d. Project Manager
  - e. Art Director
  - f. Animation Director
3. Investigate career opportunities, trends, and requirements related to Gaming Industry careers.

**Objective 2** Education Pursuits – Candidates will identify educational pursuits for College and Career Readiness.

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

**Optional: Standard performance evaluations on the final page of this document**

# Performance Skills Evaluation

## Exam name: Game Development Fundamentals

Candidate Name: \_\_\_\_\_

Performance assessments may be completed and evaluated any time before the certification is issued. The following performance skills can be used in connection with the associated standards and exam. The evaluator will function as the subject matter expert to determine if the candidate meets the skills requirements with a Yes/No for passing.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |
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| <b>Standard 1 – Video Game History</b> <ul style="list-style-type: none"> <li>• Understand relevant video game history.</li> <li>• Understand game ratings.</li> <li>• Understand gaming evolution.</li> </ul>                                                                                                                                                                                                                                      | <b>Pass:</b> |
| <b>Standard 2 – Communication Features &amp; Game Interface Design</b> <ul style="list-style-type: none"> <li>• Understand game design functionally and feedback.</li> <li>• Understand game design control, player view, and interface elements.</li> </ul>                                                                                                                                                                                        | <b>Pass:</b> |
| <b>Standard 3 – Game Platforms</b> <ul style="list-style-type: none"> <li>• Describe game consoles, platforms.</li> <li>• Identify different mobile platforms.</li> <li>• Understand impacts of distribution and media format.</li> </ul>                                                                                                                                                                                                           | <b>Pass:</b> |
| <b>Standard 4 – Game Genres and Types</b> <ul style="list-style-type: none"> <li>• Identify and understand different game genres and game types.</li> </ul>                                                                                                                                                                                                                                                                                         | <b>Pass:</b> |
| <b>Standard 5 – Game Design Production Cycle</b> <ul style="list-style-type: none"> <li>• Implement project management as part of the game design production cycle.</li> <li>• Create and develop a game concept.</li> <li>• Design and create the documents needed in the pre-production(design) of a game.</li> <li>• Create the assets and incorporate them in a game.</li> <li>• Explain alpha and beta testing processes of a game.</li> </ul> | <b>Pass:</b> |
| <b>Standard 6 – Understanding Careers</b> <ul style="list-style-type: none"> <li>• Understand careers related to the gaming industry.</li> <li>• Understand paths of skills development through ongoing education or industry experience.</li> </ul>                                                                                                                                                                                                | <b>Pass:</b> |

Evaluator Name: \_\_\_\_\_

Date: \_\_\_\_\_