Professional Certification

# Technical Artist Shading & Effects


# Field of Work

The Shading & Effects field focuses on delivering the visual intentions behind the game. People with skills and competency in shading and effects will often work with other Technical Artists and Effects Artists to prepare assets or enhance prepared assets. Shading and Effects artists are responsible for implementing the look, style, theme, and aesthetics of the game.

The core skills, in this field of work, focus on real time and baked lighting, creating and customizing shaders and rendering systems, and creating particle systems and effects that interact with other assets.

# Related Job Titles

- Shader Writer
- Lighter
- Effects Artist

# Core Skills

## Prototype

- Create and evaluate material and shader prototypes.

## Shaders and Materials

- Construct and test custom shaders to:
  - Simulate phenomena.
  - Change dynamically in response to game play events.
  - Extend the functionality of standard shaders to support the look development workflow.
  - Implement custom lighting models and non-photorealistic (NPR) looks.
- Design, construct, and implement procedural materials and material effects that adapt to scene design and inputs.
- Implement custom material UI using ShaderGUI.
- Create custom Inspectors using OnInspectorGUI().
- Implement post-effects (e.g. depth of field, color correction, bloom, screen space reflections, motion blur, and fog) to match specific cinematography referenced in GDD.
- Script the use of Render Textures to manage real time reflections.

## Rendering and Lighting

- Understand the different types of lights and their performance impacts.
- Understand the different types of shadows and their performance impacts.
- Understand the difference between forward and deferred rendering paths.
- Determine rendering API requirements and constraints per platform.
- Adapt and extend the rendering pipeline using the Unity API, command buffers, and the Graphics library.

## Particle Systems

- Simulate atmospheric phenomena using multiple Particle Systems.
- Implement typical game effects such as Fire, Explosion, Smoke and Water.
- Create complex particle effects including Particle System with Sub-Emitters, Line and Trail Renderers.
- Script Particle System events to occur during game play in response to player and NPC behavior and other runtime events.
- Import and render externally generated simulation data.
- Dynamically assess Collider and Transform data to implement interactions with Particle Systems.

## Performance and Optimization

- Understand the target platform specifications and limitations.
- Optimize shaders, Particle Systems, post effects, lighting, fog, shadows, etc. to run on target platform.
- Understand when to use optimization techniques and problem solve (billboarding, alpha sorting issues, draw calls, fill rate issues, CPU/GPU bound scenarios) where necessary.
- Analyze and evaluate rendering issues with the Frame Debugger and platform specific frame capture tools.

# Prerequisite Experience

- 4+ years in a video game development studio, with at least two shipped titles.
- Strong knowledge of physically-based lighting techniques and workflows.
- Expert level understanding of material authoring for physically-based rendering pipelines.
- Expert level understanding of color correction and post effects.
- Strong knowledge of photographic concepts.
- Experience writing shaders in HLSL, CgFX or other shading languages.
- 2-3 years of scripting/coding using languages such as C++, C#, or Unityscript.
- Strong knowledge of particle systems, dynamic simulations, and interchange formats such as Alembic.
- Fluency with the asset creation tools such as Adobe Creative Suite, Substance Designer, Substance Painter, Quixel Suite, etc.
- Strong understanding of 2d and 3d math concepts.

# Certification Exam: Topics

| **Section Description** |
|---|
| **Tooling and Pipeline** |
| Asset customization<br>Process improvement through custom tools and Editor customization |
| **Rendering** |
| Render Pipeline<br>Post processing effects<br>Cameras in Unity |
| **Shaders** |
| Shader construction, prototyping and customization<br>Render Setup shader knowledge<br>Scripting knowledge pertaining to shaders |
| **Particles and Effects** |
| Particle System customization and extension<br>Effects techniques |
| **Performance** |
| Scene optimization |