Weapon And Ammo Effects Concepts

Weapon And Ammo Effects Concepts

Particle Systems

Unity features a very robust and configurable Particle System.

Particle Systems are ideal for simulating dynamic effects like smoke, clouds, flames, and liquids.

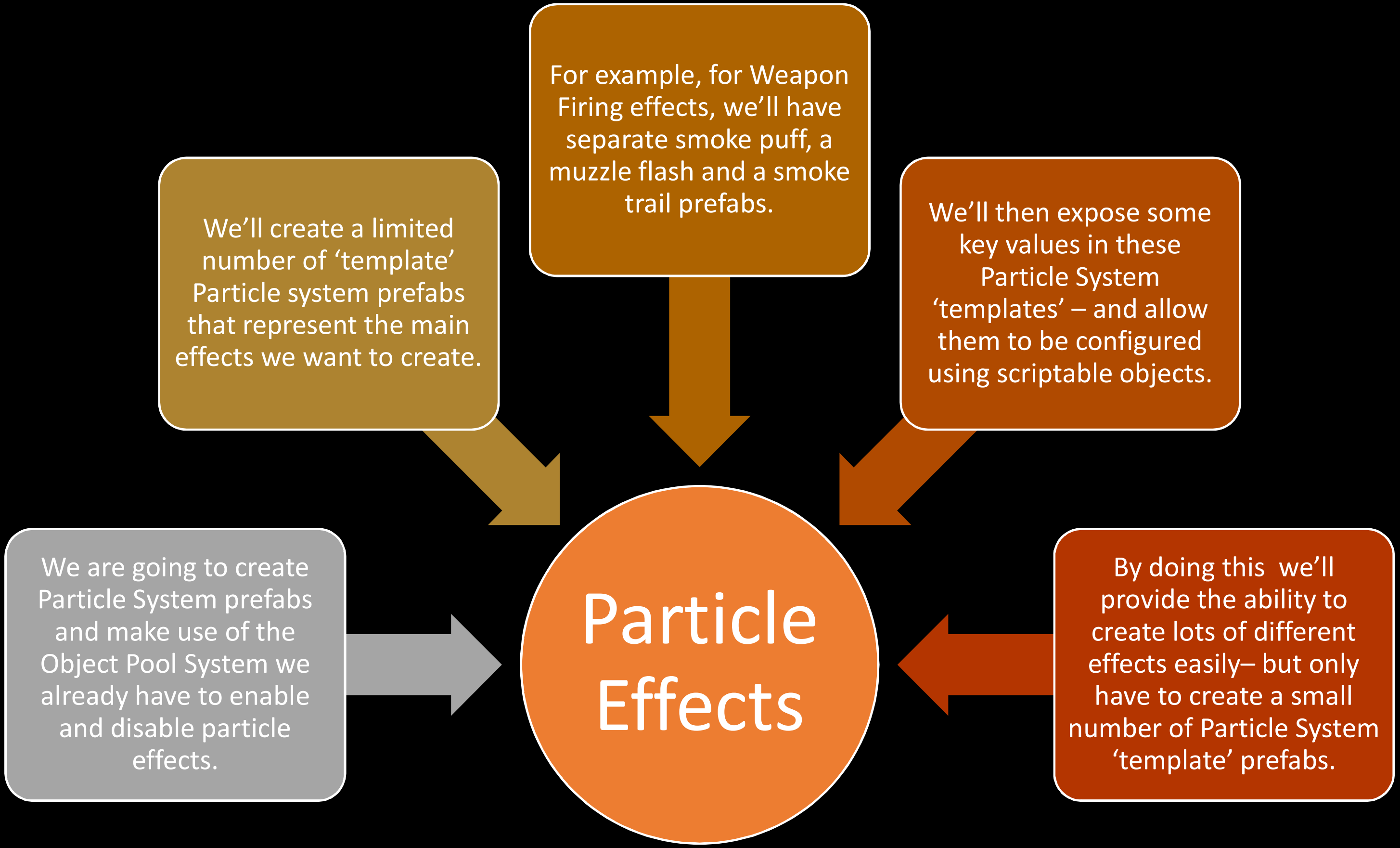
These dynamic effects would be difficult to represent using standard sprites or meshes.

Most games use particle systems to create special effects and make the game look more polished.

In Unity you create a Particle System by adding a particle system component to a gameobject.

Weapon And Ammo Effects Concepts

Particle Systems



We are going to create Particle System prefabs and make use of the Object Pool System we already have to enable and disable particle effects.

We'll create a limited number of 'template' Particle system prefabs that represent the main effects we want to create.

For example, for Weapon Firing effects, we'll have separate smoke puff, a muzzle flash and a smoke trail prefabs.

We'll then expose some key values in these Particle System 'templates' – and allow them to be configured using scriptable objects.

By doing this we'll provide the ability to create lots of different effects easily– but only have to create a small number of Particle System 'template' prefabs.

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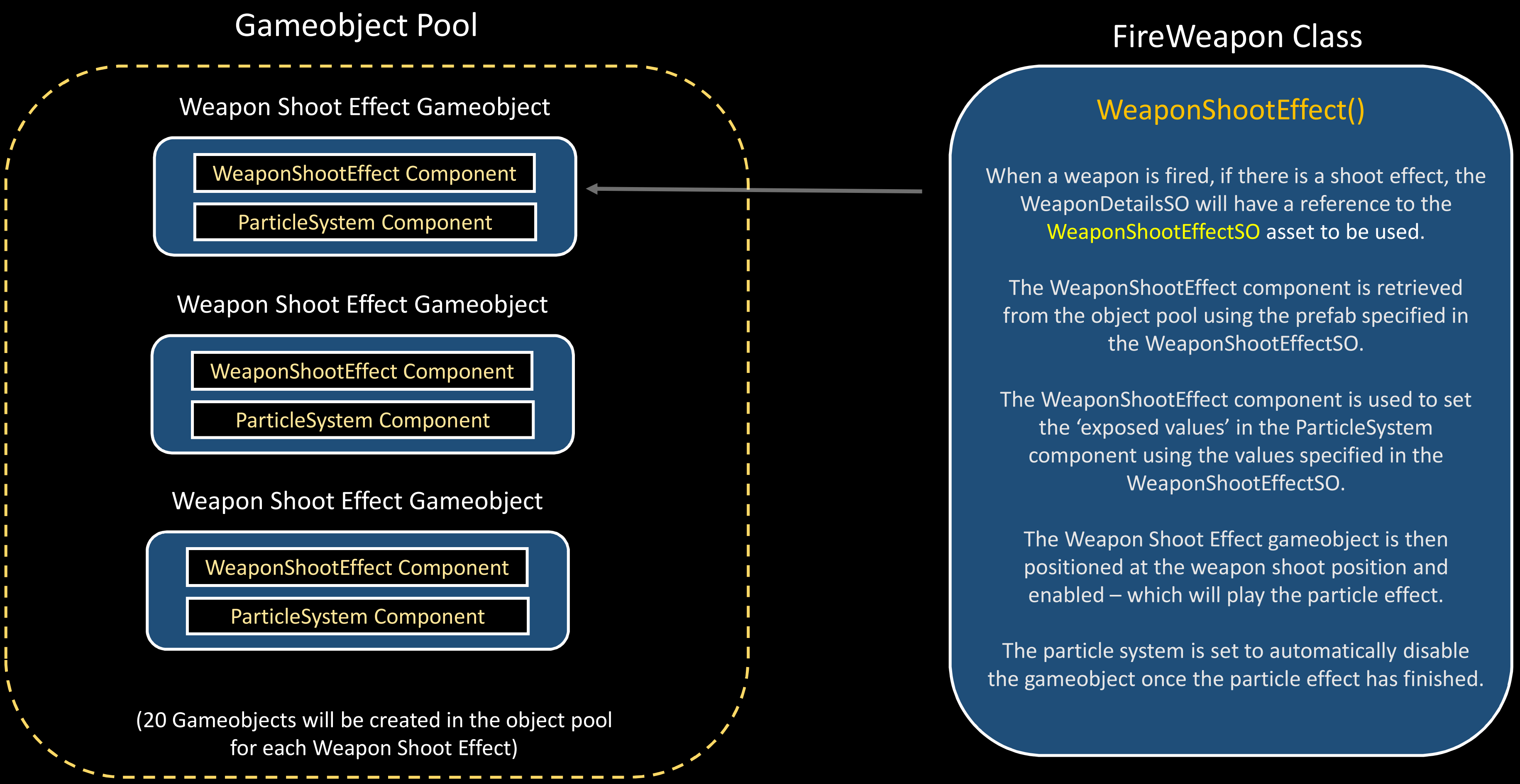
Weapon Shoot Effect - Structure



Gameobject Pool

Weapon Shoot Effect Gameobject

- WeaponShootEffect Component
- ParticleSystem Component

Weapon Shoot Effect Gameobject

- WeaponShootEffect Component
- ParticleSystem Component

Weapon Shoot Effect Gameobject

- WeaponShootEffect Component
- ParticleSystem Component

(20 Gameobjects will be created in the object pool for each Weapon Shoot Effect)

FireWeapon Class

WeaponShootEffect()

When a weapon is fired, if there is a shoot effect, the WeaponDetailsSO will have a reference to the WeaponShootEffectSO asset to be used.

The WeaponShootEffect component is retrieved from the object pool using the prefab specified in the WeaponShootEffectSO.

The WeaponShootEffect component is used to set the ‘exposed values’ in the ParticleSystem component using the values specified in the WeaponShootEffectSO.

The Weapon Shoot Effect gameobject is then positioned at the weapon shoot position and enabled – which will play the particle effect.

The particle system is set to automatically disable the gameobject once the particle effect has finished.

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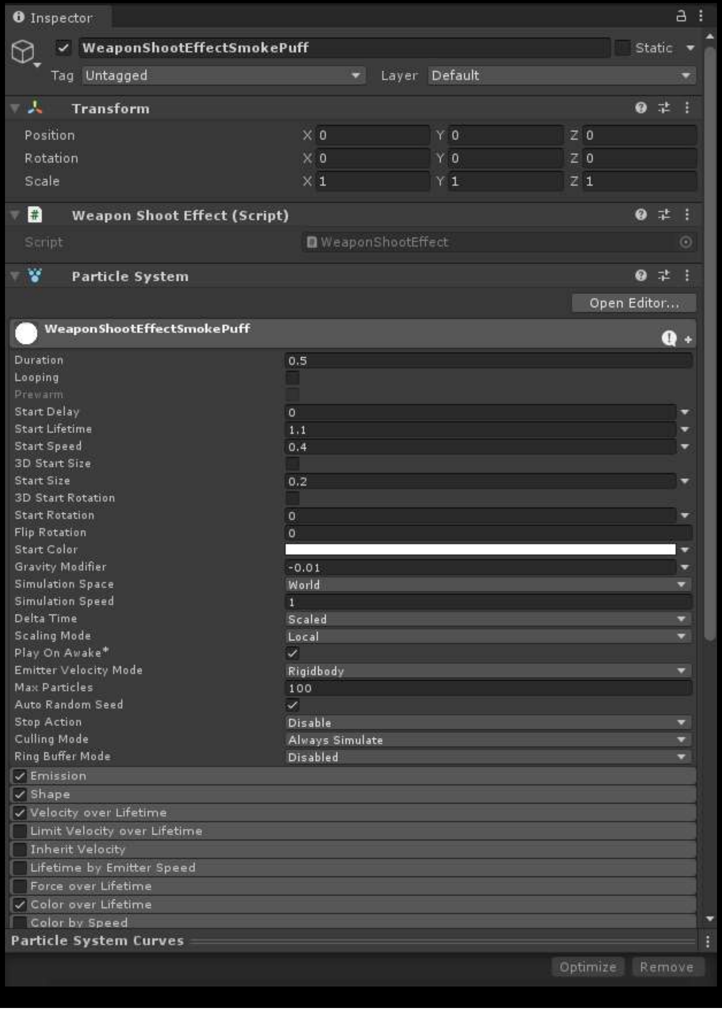
Weapon Shoot Effect Prefab



☑ WeaponShootEffectSmokePuff □ Static

Tag Untagged Layer Default

Transform

Position	X 0	Y 0	Z 0
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Weapon Shoot Effect (Script)

Script WeaponShootEffect

Particle System

WeaponShootEffectSmokePuff

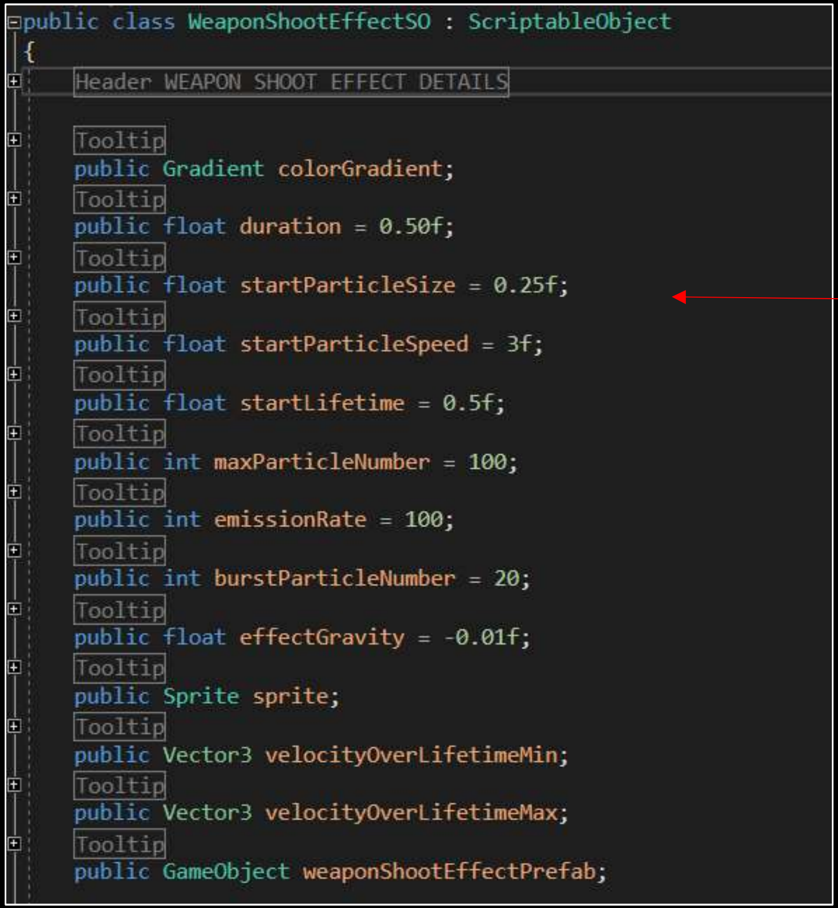
Duration	0.5
Looping	□
Prewarm	□
Start Delay	0
Start Lifetime	1.1
Start Speed	0.4
3D Start Size	□
Start Size	0.2
3D Start Rotation	□
Start Rotation	0
Flip Rotation	0
Start Color	
Gravity Modifier	-0.01
Simulation Space	World
Simulation Speed	1
Delta Time	Scaled
Scaling Mode	Local
Play On Awake*	☑
Emitter Velocity Mode	Rigidbody
Max Particles	100
Auto Random Seed	☑
Stop Action	Disable
Culling Mode	Always Simulate
Ring Buffer Mode	Disabled

☑ Emission
☑ Shape
☑ Velocity over Lifetime
□ Limit Velocity over Lifetime
□ Inherit Velocity
□ Lifetime by Emitter Speed
□ Force over Lifetime
☑ Color over Lifetime
□ Color by Speed

Particle System Curves

Weapon And Ammo Effects Concepts

WeaponShootEffectSO



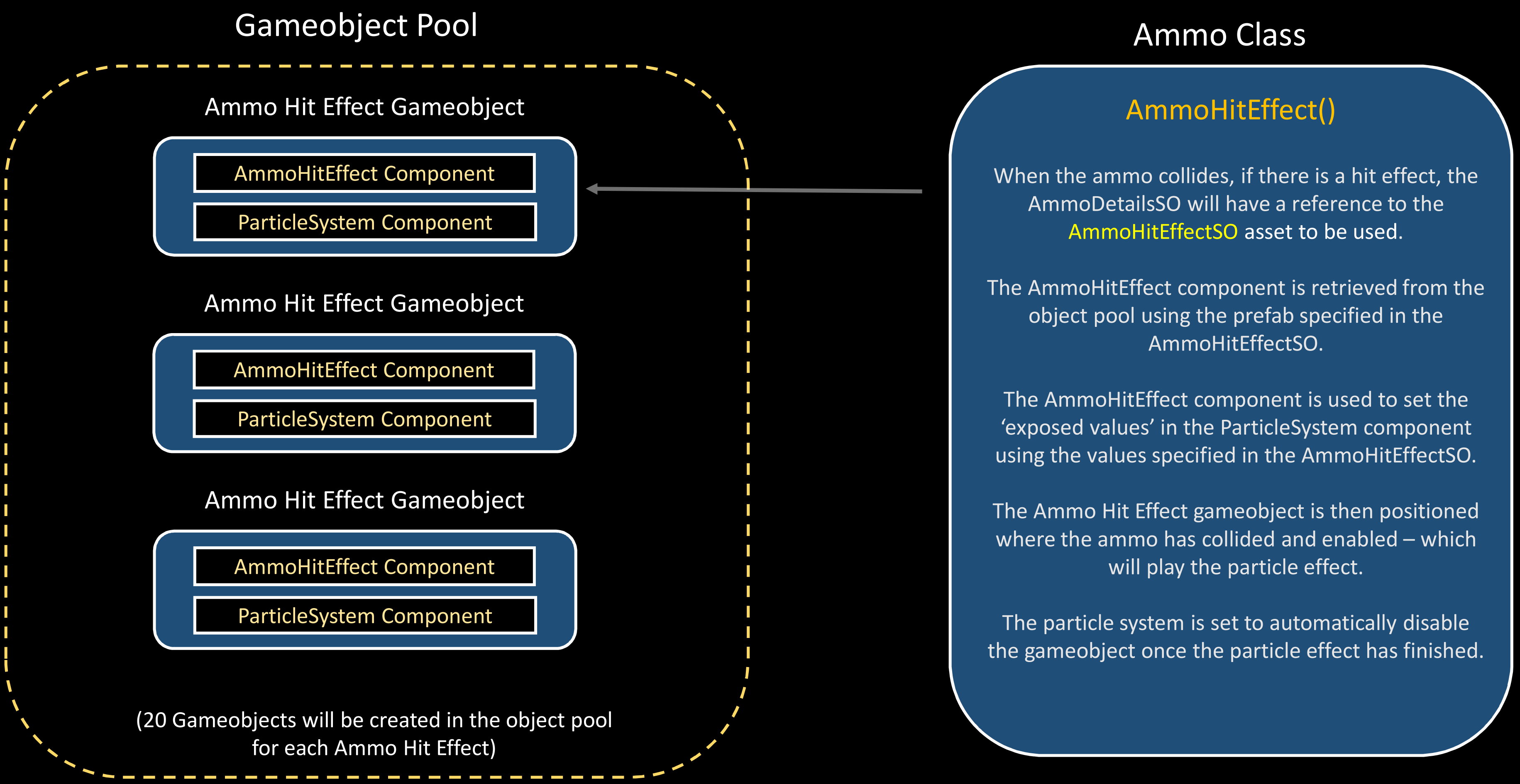
```
public class WeaponShootEffectSO : ScriptableObject
{
    Header WEAPON SHOOT EFFECT DETAILS

    Tooltip
    public Gradient colorGradient;
    Tooltip
    public float duration = 0.50f;
    Tooltip
    public float startParticleSize = 0.25f;
    Tooltip
    public float startParticleSpeed = 3f;
    Tooltip
    public float startLifetime = 0.5f;
    Tooltip
    public int maxParticleNumber = 100;
    Tooltip
    public int emissionRate = 100;
    Tooltip
    public int burstParticleNumber = 20;
    Tooltip
    public float effectGravity = -0.01f;
    Tooltip
    public Sprite sprite;
    Tooltip
    public Vector3 velocityOverLifetimeMin;
    Tooltip
    public Vector3 velocityOverLifetimeMax;
    Tooltip
    public GameObject weaponShootEffectPrefab;
```

These are the 'exposed values' of the particle system that we can configure in the WeaponShootEffectSO to create many different effects using the same prefab / particle system

Weapon And Ammo Effects Concepts

Ammo Hit Effect - Structure



Gameobject Pool

Ammo Hit Effect Gameobject

AmmoHitEffect Component

ParticleSystem Component

Ammo Hit Effect Gameobject

AmmoHitEffect Component

ParticleSystem Component

Ammo Hit Effect Gameobject

AmmoHitEffect Component

ParticleSystem Component

(20 Gameobjects will be created in the object pool
for each Ammo Hit Effect)

Ammo Class

AmmoHitEffect()

When the ammo collides, if there is a hit effect, the AmmoDetailsSO will have a reference to the AmmoHitEffectSO asset to be used.

The AmmoHitEffect component is retrieved from the object pool using the prefab specified in the AmmoHitEffectSO.

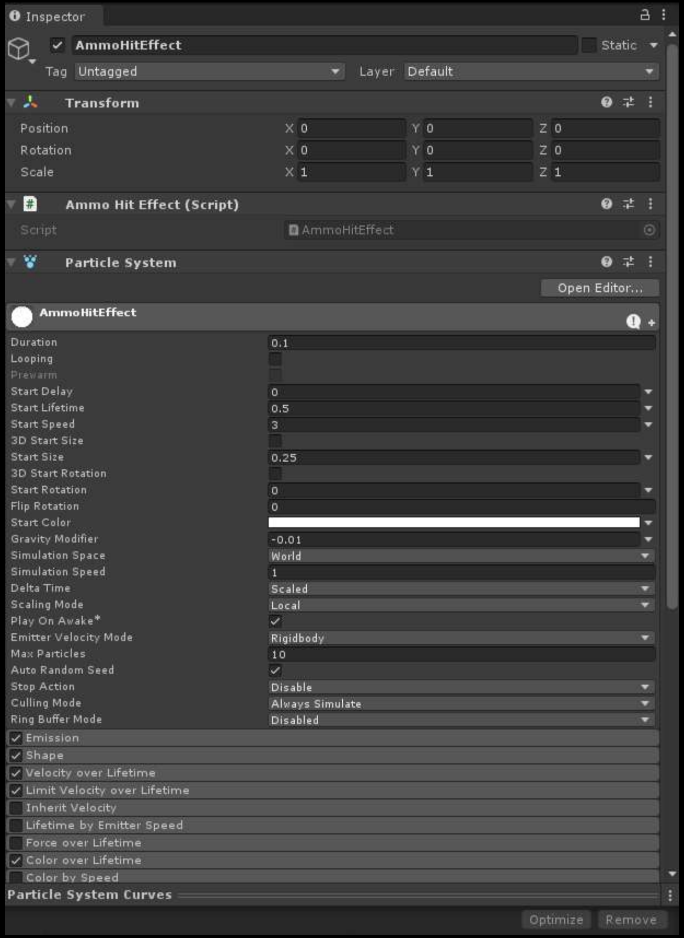
The AmmoHitEffect component is used to set the 'exposed values' in the ParticleSystem component using the values specified in the AmmoHitEffectSO.

The Ammo Hit Effect gameobject is then positioned where the ammo has collided and enabled – which will play the particle effect.

The particle system is set to automatically disable the gameobject once the particle effect has finished.

Weapon And Ammo Effects Concepts

Ammo Hit Effect Prefab



☑ AmmoHitEffect □ Static

Tag Untagged Layer Default

Transform

Position X 0 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

Ammo Hit Effect (Script)

Script AmmoHitEffect

Particle System

AmmoHitEffect

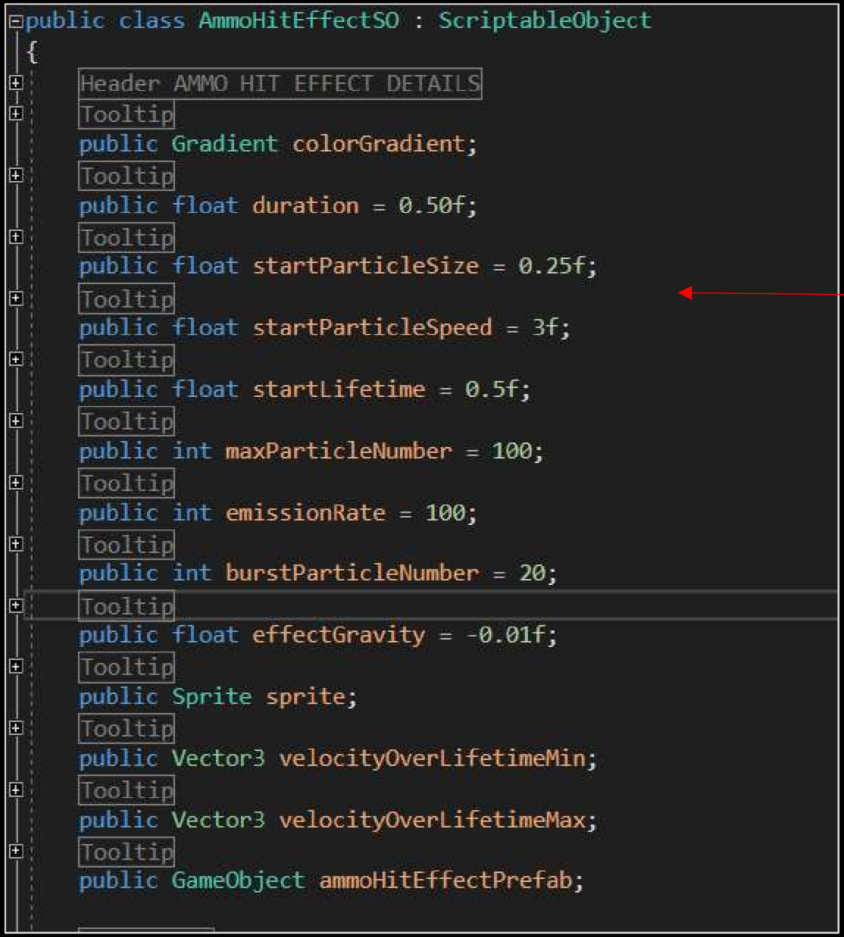
Duration 0.1
Looping □
Prewarm □
Start Delay 0
Start Lifetime 0.5
Start Speed 3
3D Start Size □
Start Size 0.25
3D Start Rotation □
Start Rotation 0
Flip Rotation 0
Start Color ⬜
Gravity Modifier -0.01
Simulation Space World
Simulation Speed 1
Delta Time Scaled
Scaling Mode Local
Play On Awake* ☑
Emitter Velocity Mode Rigidbody
Max Particles 10
Auto Random Seed ☑
Stop Action Disable
Culling Mode Always Simulate
Ring Buffer Mode Disabled

☑ Emission
☑ Shape
☑ Velocity over Lifetime
☑ Limit Velocity over Lifetime
□ Inherit Velocity
□ Lifetime by Emitter Speed
□ Force over Lifetime
☑ Color over Lifetime
□ Color by Speed

Particle System Curves

Weapon And Ammo Effects Concepts

AmmoHitEffectSO



```
public class AmmoHitEffectSO : ScriptableObject
{
    Header AMMO HIT EFFECT DETAILS
    Tooltip
    public Gradient colorGradient;
    Tooltip
    public float duration = 0.50f;
    Tooltip
    public float startParticleSize = 0.25f;
    Tooltip
    public float startParticleSpeed = 3f;
    Tooltip
    public float startLifetime = 0.5f;
    Tooltip
    public int maxParticleNumber = 100;
    Tooltip
    public int emissionRate = 100;
    Tooltip
    public int burstParticleNumber = 20;
    Tooltip
    public float effectGravity = -0.01f;
    Tooltip
    public Sprite sprite;
    Tooltip
    public Vector3 velocityOverLifetimeMin;
    Tooltip
    public Vector3 velocityOverLifetimeMax;
    Tooltip
    public GameObject ammoHitEffectPrefab;
```

These are the 'exposed values' of the particle system that we can configure in the AmmoHitEffectSO to create many different effects using the same prefab / particle system