

Objective:

Students will create a smoke burst effect that can be triggered by an event, such as extinguishing and re-igniting a fire, and they will also learn how to animate individual particles using texture sheets. This project helps students understand visual effects (VFX), particle systems, and texture animations in Unity.



Step 1: Prepare the Work Area

Goal: Clear distractions and prepare the scene for adding smoke and texture sheet effects.

- Open the CreativeCore_VFX_ProjectFiles project in Unity Editor.
- Navigate to `Assets > CreativeCore_VFX > Scenes` and open `TutorialScene_VFX_Outdoor`.
- In the Hierarchy, select `Fire_ParticleSystem_Prefab` and mark it as inactive in the Inspector.
- Deactivate the Point Light attached to the firepit and turn off any weather effects.

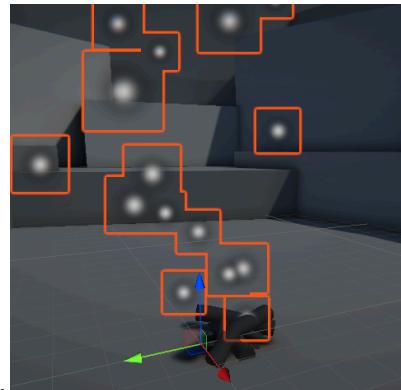
Expected: A clean Unity scene ready for adding smoke effects.



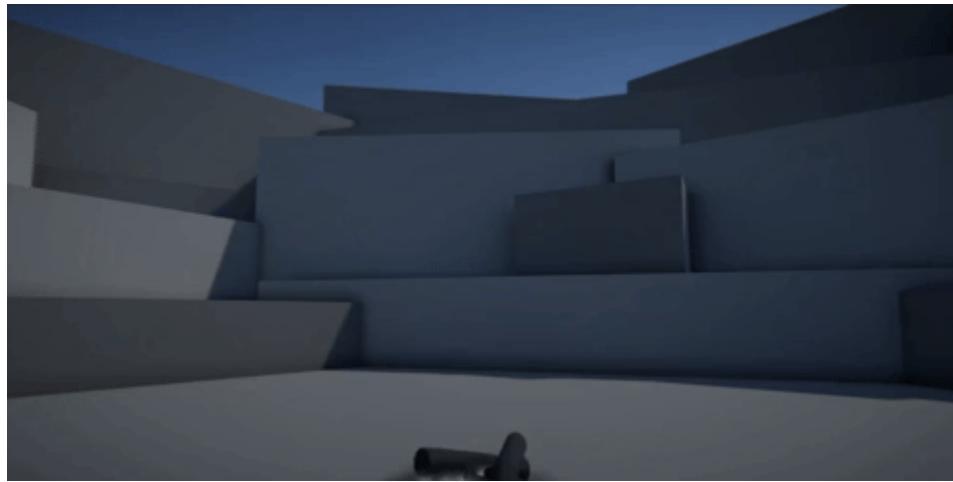
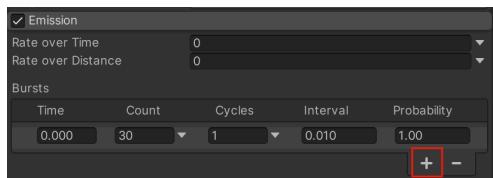
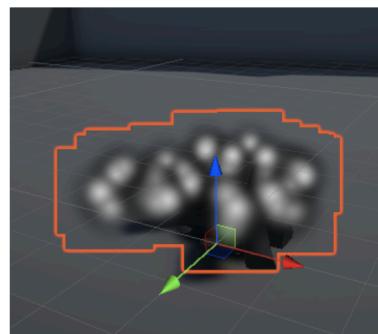
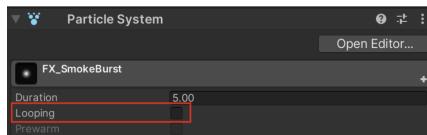
Step 2: Add a New Burst of Particles

Goal: Create a new particle system to simulate a smoke burst.

- In the Hierarchy, right-click > **Effects > Particle System** to create a new particle system.
- Rename it **FX_SmokeBurst**.
- Position it at **X=0, Y=0.5, Z=0** and rotate it to **X=-90, Y=0, Z=0**.
- In the Particle System component, expand the **Main** Module and uncheck **Looping**.
- In the **Emission** Module, set **Rate Over Time** to 0.
- Click the **+** in the **Bursts** Section to add a burst of 30 particles at 0 seconds.



✓ **Expected:** A visible smoke burst effect in the scene.



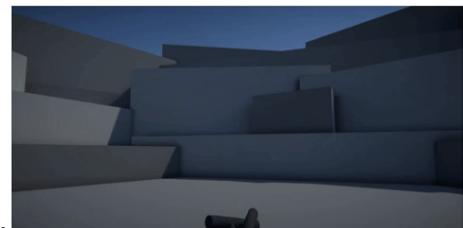
Step 3: Adjust Particle Movement

Goal: Slow down the smoke and make it disappear naturally.

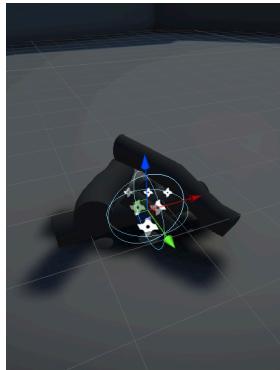
- In the **Main** Module, set **Start Speed** to **0.3**.



- Reduce **Start Lifetime** to **1.0** seconds.
- In the **Shape** Module, change the **Shape** to **Sphere** and set **Radius** to **0.5**.

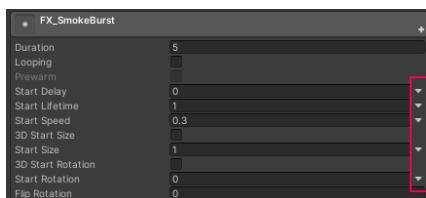


Expected: A slow-rising smoke burst that appears from the firepit.

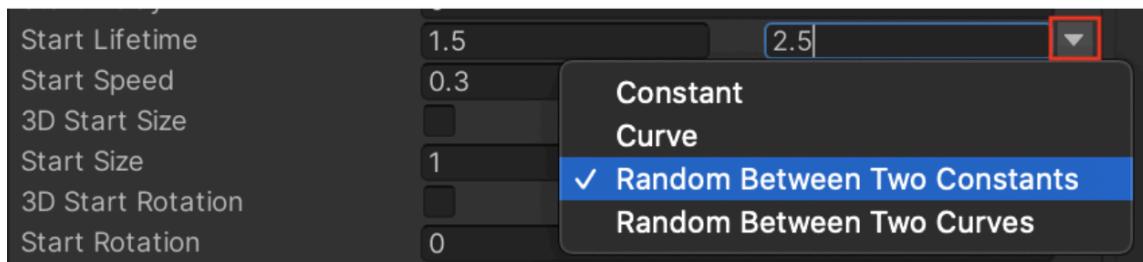


Step 4: Add Randomness to the Particles

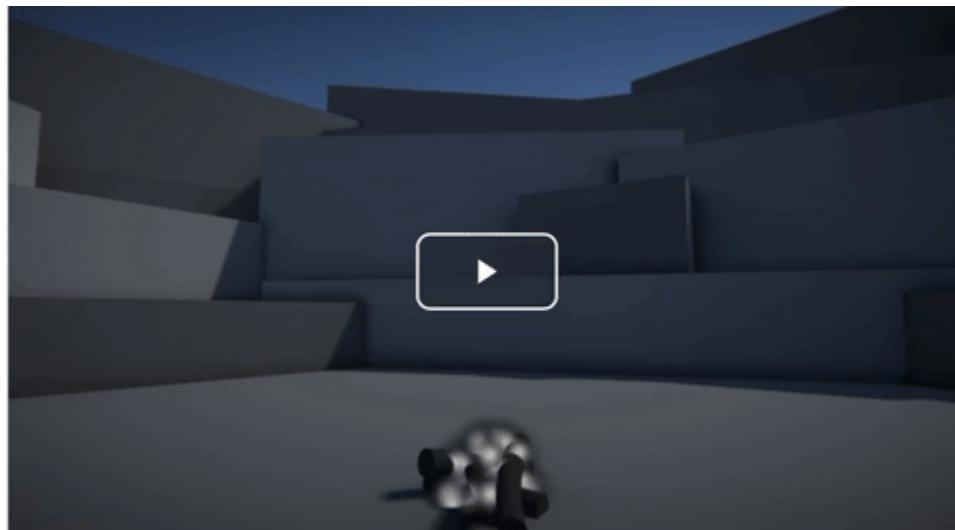
Goal: Make the effect look more natural by introducing variation.



- In the **Main Module**, find **Start Lifetime**.



- Click the dropdown arrow and select **Random Between Two Constants**. Set the minimum to **0.5** and maximum to **1.5**.



- Repeat for **Start Speed**, choosing an appropriate range (e.g., 0.1 to 0.5).

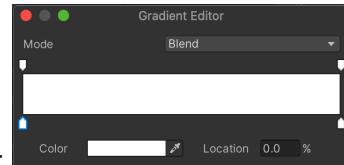
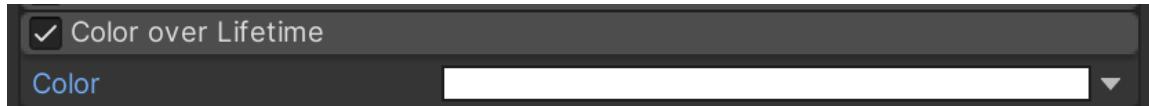
✓ Expected: Particles with varying speeds and lifetimes for a more realistic effect.



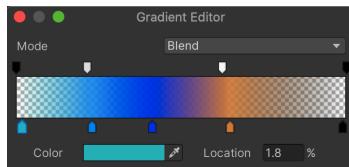
Step 5: Adjust Color and Transparency Over Time

Goal: Make the smoke fade in and out naturally.

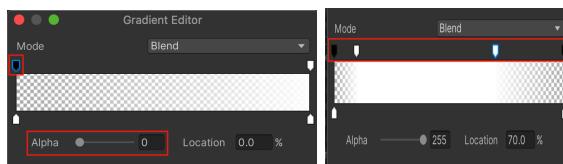
- Enable **Color over Lifetime** Module and expand it.



- Click the **Color Box** to open the Gradient Editor.

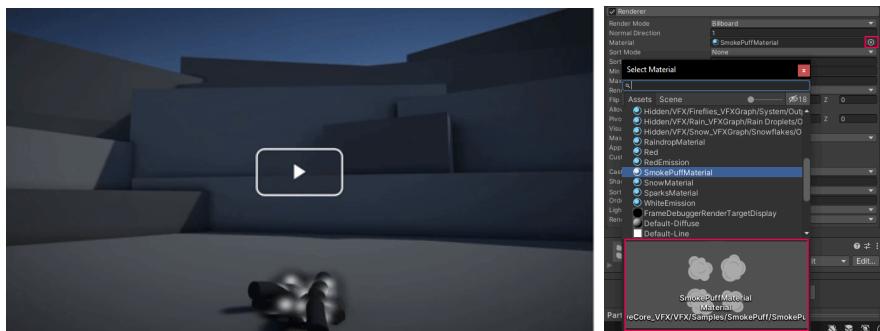


- Add transparency by setting the leftmost marker's Alpha to 0 (fully transparent).



- Add another marker near the middle and set Alpha to 255 (fully opaque).
- Add a final marker at the right and set Alpha to 0 (fade out).

Expected: Smoke that fades in and out smoothly.



Step 6: Understanding Texture Sheets

Goal: Learn how texture sheets can animate particles for dynamic effects.

- A texture sheet contains multiple images in a grid format, cycling through images to create an animation.

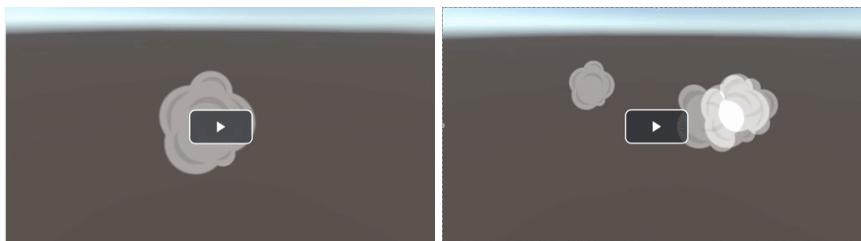


- It can randomize images to add variety to the animation.

Expectation:

Students will understand that texture sheets help create more dynamic animations compared to

a single texture.



Step 7: Change the Default Material

Goal: Assign a material that uses a texture sheet.

- Open Unity and select the **Particle System** in the Inspector.
- Expand the **Renderer** Module.
- Find the **Material** property and use the Object Picker to select **SmokePuffMaterial**.

Outcome:

Each particle now contains a grid of four images.

Step 8: Enable Texture Sheet Animation

Goal: Make the particles animate using the texture sheet.

- Expand the [Texture Sheet Animation](#) module.
- Click the checkbox to [Enable](#) it.
- Set [Tiles X = 2](#) and [Tiles Y = 2](#) (since the texture sheet has 2 rows and 2 columns).

Outcome:

Each particle will cycle through four images in the texture sheet.

Step 9: Randomize Start Frames

Goal: Give the particles a random starting frame.

- In [Start Frame](#), select [Random Between Two Constants](#).
- Set [Start = 0](#) and [End = 3](#) to randomize the frames.
- Set [Cycles = 0](#) (it will automatically change to [0.0001](#)).

Outcome:

Each particle starts with a random image from the texture sheet and stays with that image.

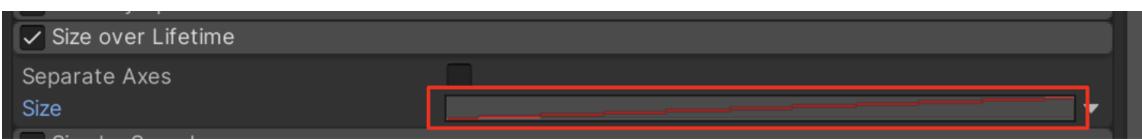
Step 10: Adjust Particle Size Over Lifetime

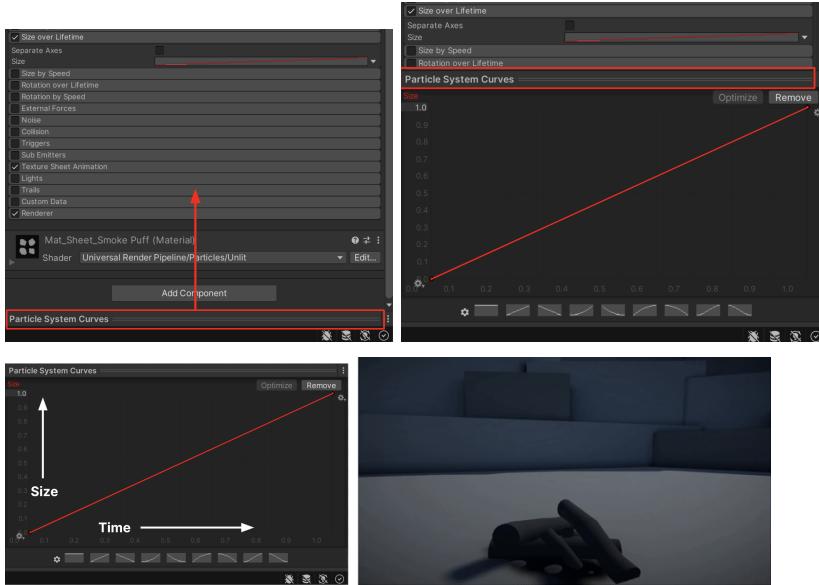
Goal: Make the particles change size over their lifetime.

- Enable the [Size Over Lifetime](#) module.



- Click the [Curve Preview Box](#) to open the [Particle System Curve Window](#).





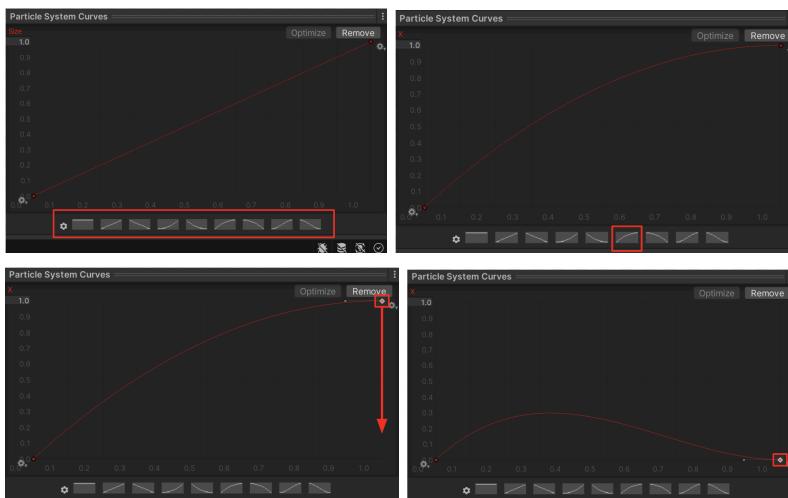
Outcome:

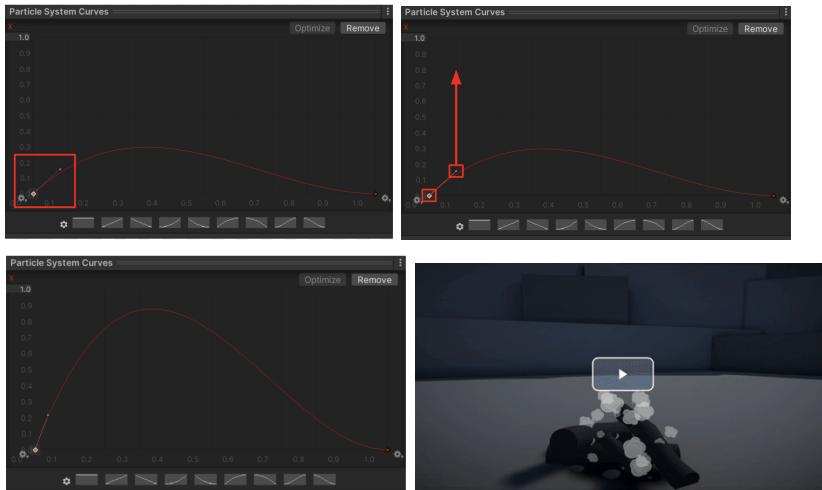
Students will see how particle size changes over time.

Step 11: Customize the Size Curve

Goal: Customize the particle size to grow and shrink over time.

- Try different preset curves at the bottom of the Curve Editor.





- Choose a curve that looks like an upside-down U (particles grow and then shrink).
- Adjust the keyframes so the curve returns to zero at the end and increases size at the start.

Outcome:

Particles start small, grow larger, then shrink before disappearing.

Step 12: Save the Effect as a Prefab

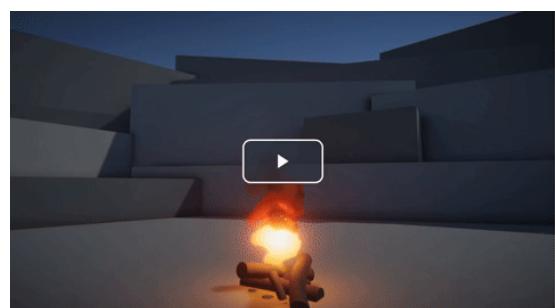
Goal: Make the smoke burst effect reusable.

- Drag the Particle System from the Hierarchy to the **Prefabs** Folder.

Outcome:

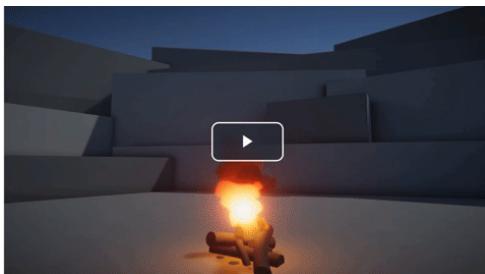
The effect is saved as a prefab and can be reused.

Step 13: Trigger the Animation with a Key Press

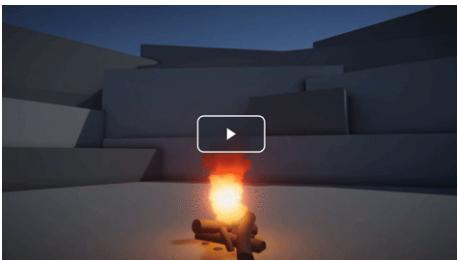


Goal: Allow the effect to be triggered by a user input.

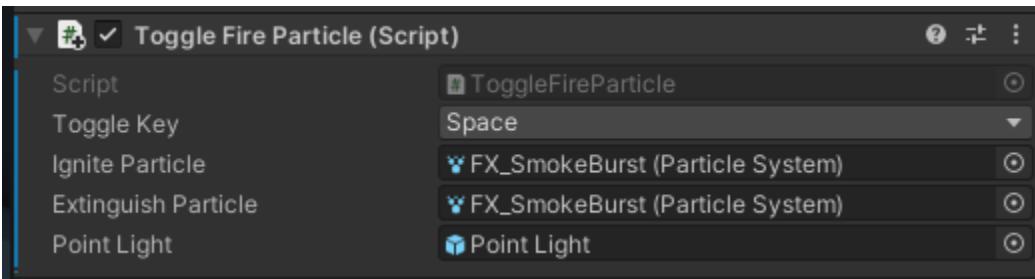
- Enable `Fire_ParticleSystem_Prefab` and `Point Light`.



- Ensure `Play on Awake` is enabled for the fire but disabled for the smoke burst.



- Drag the `ToggleFireParticle` Script onto `Fire_ParticleSystem_Prefab`.



- Assign references for `Point Light`, `Ignite Particle`, and `Extinguish Particle`.

By default, pressing the spacebar will toggle fire and smoke.

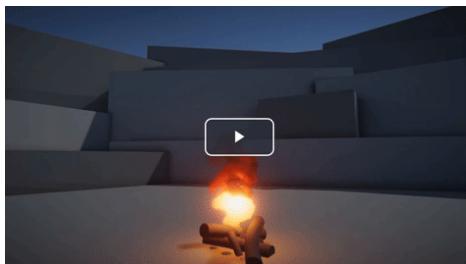
Outcome:

The user can press a key to toggle the smoke burst effect.

Step 14: Experiment with Sub-Emitters (Optional Advanced Step)

Goal: Add additional effects like sparks or debris.

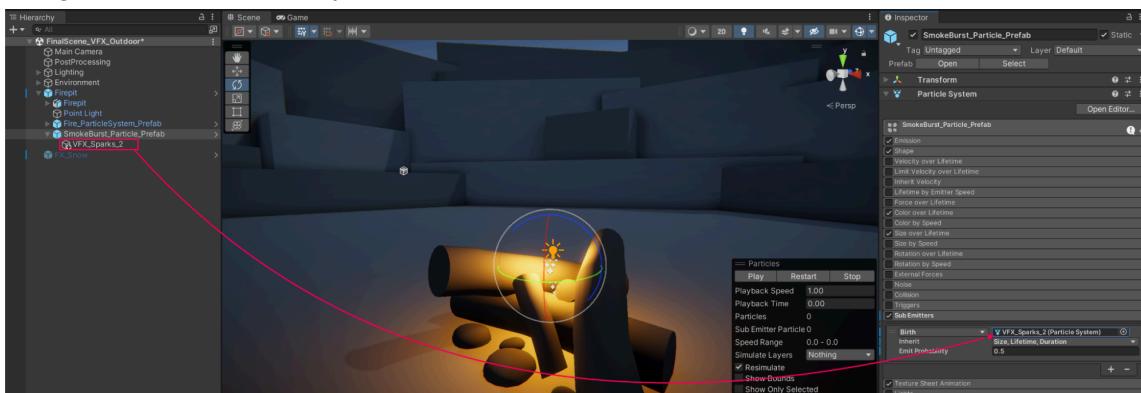
- Create a new particle system as a child of the smoke burst.



- Enable the **Sub-Emitter** Module in the parent particle system.



- Assign the child particle system as a sub-emitter.



Outcome:

Students can add secondary effects like sparks or debris.

Final Submission:

1. Export the scene as WebGL.
2. Ensure the smoke burst effect works as expected.
3. Submit the WebGL link.
4. Save and submit a Prefab file.
5. Take a screenshot of the particle system in action.

Expected Outcome:

A smoke burst effect that can be triggered to appear and disappear in a realistic way with animated particles using a texture sheet.

