

Optimization Tips

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General

- Reduce hierarchy complexity. Don't nest too many children within children if unnecessary.
- Use the Unity Profiler to check performance regarding your area. Don't "optimize" on a whim, rather look at the Profiler to see if it is an issue.
- Don't use Animator components for non-character objects. If you need to "animate" a value or a colour change in UI for example, use DOTween instead.

Textures

- Read/Write Enabled should be OFF.
- Generate Mip Maps should only be on for 3D object textures, not UI textures.
- Atlas textures of similar objects. Pack them into one big texture. Use Unity SpritePacker or Unity SpriteAtlas or Texture Packer).
- Delete unused textures in the project.
- Most textures should be 1024x1024 pixels. Only use bigger textures for bigger and more important objects.
- Remove the alpha channel on the texture when it's not needed.

Models

- Import files as .fbx.
- Read/Write Enabled should be OFF.
- Import Cameras should be OFF.
- Import Lights should be OFF.
- Import BlendShapes should be OFF.
- Import Visibility should be OFF.
- Optimize Mesh should be ON.
- Generate Colliders should be OFF.
- Weld Vertices should be ON.
- Make 3 LOD's for environment objects.
- Set object to static if it's an environment object.
- Delete unused meshes from project.
- Disable Rig, Animation and Materials tabs if the object doesn't need them.

Animations

- Import as .fbx and disable the mesh imports if all that is needed is the animation.
- Delete unused files from the project.

Graphics

- Use the same material for similar objects. E.g all trees share one material (textures must be atlased).
- Disable shadows for small or objects obstructed by the shadows of bigger objects.
- Use culling masks to determine what is and isn't affected by certain lights.
- Use forward rendering.

UI

- Hide UI elements that are being obstructed by other UI elements.
- Use various canvases instead of a single big one. Group them in terms of how often their values or properties get updated.
- All elements in a canvas should have the same Z value.
- Raycast Target/Graphic Raycaster should be off/removed unless the element is interactable (e.g. a button).
- Atlas UI sprites. Pack them all in one texture.
- Disable cameras that render the 3D world when a full screen UI that obstructs the game world is active.
- Delete unused sprites from the project unless they are in an atlas.

Sound

- Import files as uncompressed .wav.
- Enable the Force to Mono feature on all sounds.
- Delete unused sounds from the project.
- Small clips (<200kb) should be on Decompress on Load.
- Medium clips (>= 200kb) should be set to Compressed in Memory.
- Large clips (background/ambience music) should be set to Streaming.
- Don't stream audio if it is muted/no volume. Pause/Stop/Delete it(depending on frequency of use).

Tech

- Use Scriptable Objects as much as possible.
- Remove directories that aren't being used, these are usually greyed out when not being used (using.UnityEngine, etc..)
- Remove functions like Start() and Update() if they are not being used.
- Avoid heavy logic inside of Start() and Awake().
- Avoid string functions. Hash the values instead.
e.g. `Animator.SetTrigger("Jump");`

```
int JumpTrigger = Animator.StringToHash("Jump");  
Animator.SetTrigger(JumpTrigger);
```

- If the object has a Rigidbody component, move it using the Rigidbody, not transform.Translate, etc...
- Avoid adding components during runtime, use prefabs instead. E.g. `gameObject.AddComponent()`.
- Cache references in Start(). E.g. `GetComponent()`, etc...
- Remove `Debug.Log()`'s when you're done using them.
- Optimize the Collision Matrix.
- Limit the framerate to 60fps.
- Lower frame rate to 30fps during the Main Menu and Pause Menu.