Week 3: Unity Basics (Part 2)

Welcome to Week 3!

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Slides: Week 3: Unity Basics (Part 2)

3.1 – Asset Origins

When sourcing assets for Unity projects, there are two main options: creating your own or using third-party assets from Digital Marketplaces. Which of the two options would be the best for a project depends on factors like project's timeline, design style, requirements, and developer experience. In many cases, a mix of both are used.

3.1.1 – Make your own assets

There are many software tools for creating assets, such as Blender, 3ds Max, Illustrator, and Gimp. These are the same tools used by professionals in the game development industry. Creating your own assets gives you full creative control over your project; however, it can be time-consuming, especially if you aren't familiar with these tools. This course will not cover asset creation, but there are numerous forums and YouTube tutorials available to help you learn. Additionally, the EAC has a lead artist with industry experience who can provide resources if interested.

If you aren't making your own assets, you have to check the asset documentation for any restrictions on the usage and citation requirements of the assets.

3.1.2 – Digital Marketplaces

Digital marketplaces are online platforms where developers and artists buy, sell, or exchange digital content like 3D models, audio files, and code. The Unity Asset Store is a popular digital marketplace for Unity projects because it is operated and maintained by Unity. (Figure 1). Most of the assets on the Unity Asset Store are designed and optimized for Unity projects. Another well-known marketplace is http://itch.io , which offer many assets that can be using in Unity projects. Using assets from these marketplaces can reduce development time.

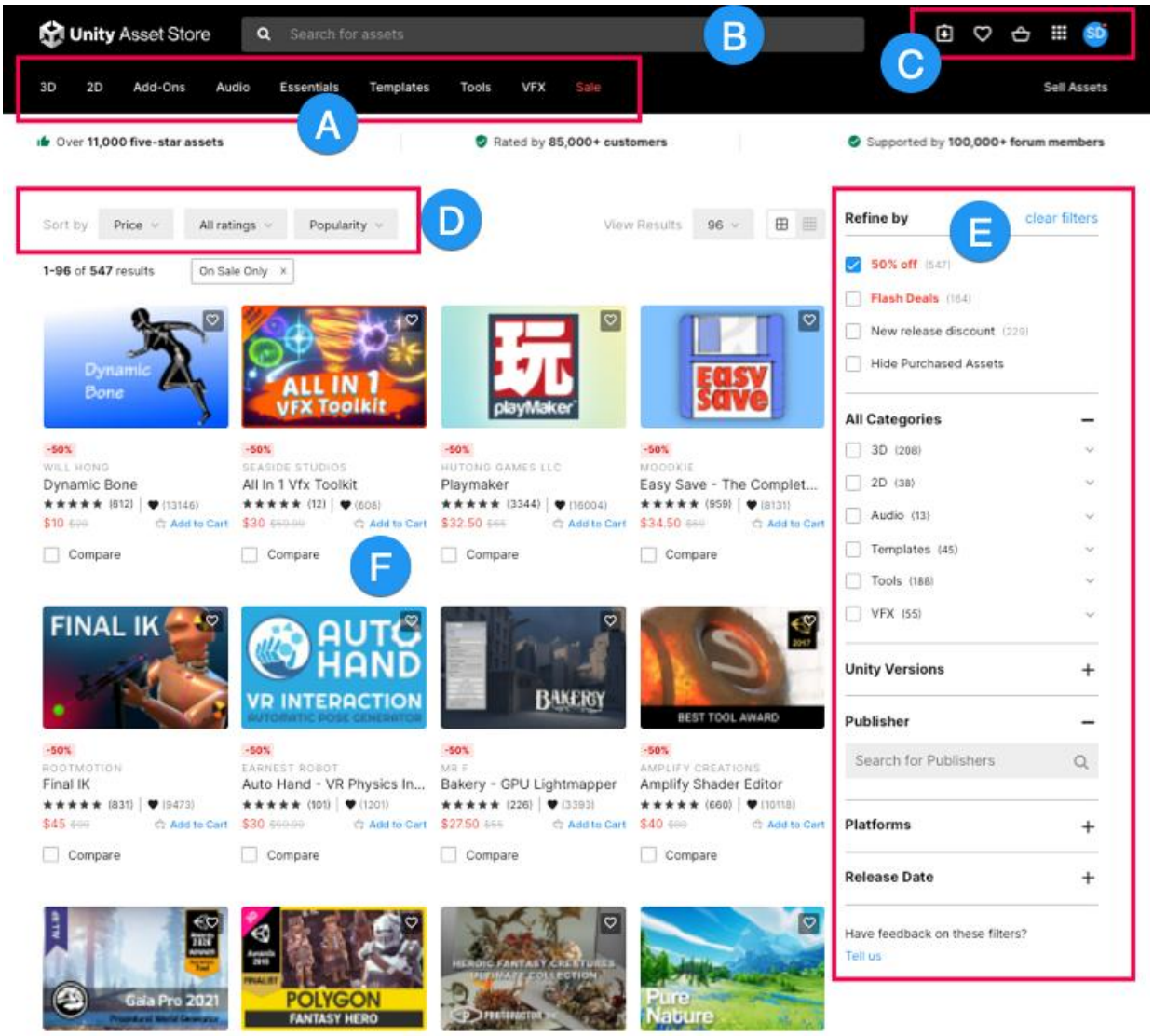

Figure 1. Photo from https://docs.unity3d.com/6000.0/Documentation/Manual/AssetStore.html

A) Collection menu helps you see lists of packages that are related to specific topics

B) The search bar lets you search for specific packages according to a package's name, word or phrase, or a file name

C) The toolbar gives you access to the following areas:

- assets that have already been purchased

- assets that have favorited
- shopping card
- other Unity applications
- Unity account

D) Filter and sort controls for the packages that are displayed as search results

E) Filter sidebar is a more in-depth category filter.

F) List of packages that are results of any user specified searches , filters, sorting, or categories.

3.2 – Package Manager

The Package Manager is a tool that helps with managing features, tools, and assets in their project. Additionally, it manages both official Unity packages and third-party packages to keep everything organizing and up to date. (Figure 2).

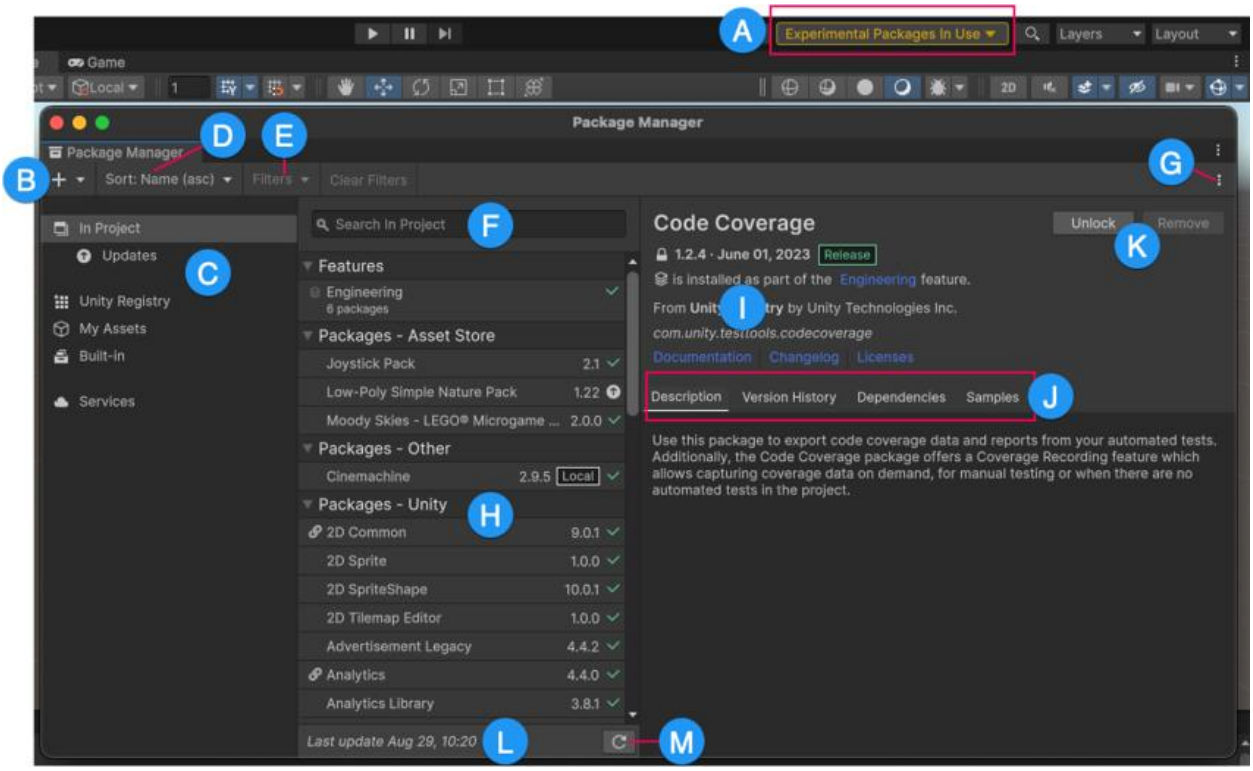

Figure 2. Photo from https://docs.unity3d.com/6000.0/Documentation/Manual/upm-ui.html

The Package Manager window displays:

A) The experimental package indicator, which warns you if your project has experimental packages

B) The install button, which you can click to install a package directly into your project bny entering a git URL, a local path, or a package name.

C) The navigation panel, which you can use to select a context to change what appears in the list panel.

D) The Sort menu, which you can use to sort the list of packages and feature set by name or date.

E) The Filter menu, which you can use to narrow down which packages appear in the list panel. The Filters menu and the Clear Filters button are disabled for the Built-in list. THey're also disabled for the In Project context (unless you have subscription based packages), because that context in the navigation panel has a nested item for Updates.

F) The Search box allows you to look for packages, features sets by name.

G) The Advanced menu, which you can use to access the project settings for the Package Manager, preferences, and more.

H) The list panel, which displays packages for the type you selected in the navigation panel, limited by any filter and search parameters you specified.

I) The details panel, which displays information specific to the package or feature set selected in the list panel.

J) The package details tab, which display further information about the selected package or feature set. The tabs are dynamic, based on the selected item.

K) Buttons that perform different actions depending on the type of package.

L) The status bar, displays information when the Package Manager loads packages and feature sets. It could also include other messages and errors.

M) The Refresh List button lets you refrest the list of packages being displayed.

3.3 – Sprites

Sprites are a type of 2D asset that represent an image or a portion of an image. They can depict character, backgrounds, UI elements, or other visual elements. To save space, sprites are often stored in Sprite Sheets—a single file containing multiple individual sprites or animations frames arranged in a grid. (Figure 3). To use the sprites, the sheets must be sliced into separate images. Unity includes a built-in Sprite Editor that allows developers to slice Sprite Sheets and prepare sprites for use.

Figure 3. Photo from https://krita-artists.org/t/sprite-sheets-editing-brush-presets-and-alternating-brushes/17079

3.3.1. Formatting Sprites

1. Select the Sprite Sheet you want to slice in the Project window.
2. Confirm that the Texture Type is Sprite (2D and UI)
3. Change the “Sprite Mode” to Multiple
4. Apply the changes
5. Select “Open Sprite Editor”
6. Make sure that Sprite Editor is selected in the top left corner
7. Select the error to the right of the Slice button
8. Select the type of slicing you would like
9. Select slice

3.4 – World Building

World building is the creative process of designing the immersive universe that gives a game its depth and atmosphere. Playing the game can be thought of as looking through a window into the game’s world. In 3D games, the true third dimension enhances immersion through changing camera perspective, movement, and player freedom. On the other hand, 2D games occur within a flat plane, so depth and elevation are used to create a similar sense of space. Depth is the illusion of three-dimensional space within a flat design, through artistic techniques like overlapping shapes, diminishing scale, and perspective lines that make objects appear to recede into the distance. See Figure 4 to see a comparison between 2D and 3D world building.

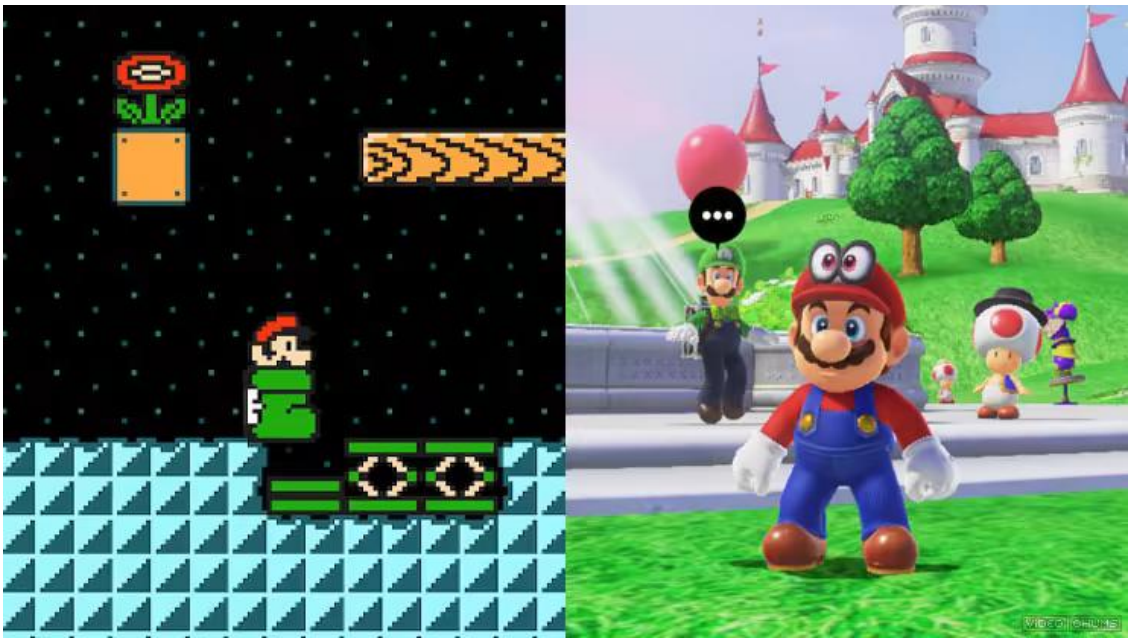

Figure 4. Photo from https://videochums.com/article/2d-platformers-vs-3d-platformers

3.4.1 – Layering Sprites

1. Drag sprites from the Project window into the Scene or Hierarchy view.

2. Select a sprite in the Hierarchy.

3. Specify the correct Sorting Layer the sprite should be in

4. Adjust the Order in Layer Property in the Sprite Renderer component
    1. Higher numbers render on top of lower numbers.

    Example:

        Background sprite (Order in Layer: 0)

        Character sprite (Order in Layer: 1)

5. Preview in Scene View to confirm the stacking effect you want.

3.4.2 – Creating Sorting Layers

1. Go to Edit > Project Settings > Tags and Layers > Sorting Layer
2. Create custom layer
3. Assign each sprite to the correct sorting layer

3.5 – Exercises

Reinforcement

The reinforcement section is used to check the understanding of the information that was presented in the powerpoint/document. Please answer the questions in your own words.

R—3.1 What are the advantages and disadvantages of creating your own assets for a Unity project?

R—3.2 How do digital marketplaces like the Unity Asset Store and itch.io help developers when sourcing assets for their projects?

R—3.3 What is the purpose of the Package Manager in Unity, and what types of packages does it manage?

R—3.4 What is a sprite in Unity, and what types of visual elements can it represent?

R—3.5 Why are Sprite Sheets used, and how does Unity help developers prepare individual sprites from them?

R—3.6 How does world building contribute to the depth and atmosphere of a game?

R—3.7 What techniques are used in 2D games to create the illusion of depth, and why are they important?

Project

The project section's tasks are used in work toward creating the final Flying Bird game project for the end of the course.

P—3.1 Add the following assets to your Unity Account's Assets: "2D Pixel Art Platformer | Biome – American Forest", "Landscape Tiles & Birds (Free), "Cyberpunk Sunset", and "SunnyLand Woods"

P—3.2 Use the Package Manager to add those assets to your Unity project

P—3.3 Design a background using the asset that you added to your Unity account