Pixel Dungeon Dojo

Level Design Guidebook

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Introduction

Congratulations on purchasing Pixel Dungeon Dojo! And, **thank you**.

This tutorial project is a framework for **an infinite number of dungeon levels**, with puzzles, traps and monsters, exploration, hazards and treasure.

The level designer is YOU.

A Dojo is traditionally known as **a place to learn and practice**, and the Pixel Dungeon Dojo is a place to practice level design. This guidebook is here to present the Dojo to you, in a way that anyone can use this framework to build their own dungeon-crawling game levels and see those levels and your name in the credits of a casual 2D game.

Your name in the credits, your dungeon levels in the game.

Those already familiar with level design or familiar working with Unity will find the Pixel Dungeon Dojo makes level design **a quick and cozy experience**, allowing you to focus on level design practices and to freely explore new designs in architecture, combat design and game story.

Cozy and fun and cool and easy, for both beginners and seasoned level designers.

In Pixel Dungeon Dojo, we are free to practice the way and to **design levels your players will love**.

Overview

Pixel Dungeon Dojo is a tutorial project in Unity, showing a relatively casual 2D top-down pixel art dungeon-crawling game with puzzles, traps and monsters. But the real value in Pixel Dungeon Dojo is that it is a framework, **a platform specifically for designing levels** of this game.

The game menu system will reflect the levels you build, including **your name in the credits** as the author of those dungeon levels. You have the power with Pixel Dungeon Dojo to create dungeons of your own, with as many levels in those dungeons as you like.

Making a new dungeon is as easy as making a folder.

Making a new level starts with a **template scene** you "Save As..." and place in your dungeon folder, naming this scene appropriately for the game system:

.../Scenes/[Your Dungeon Name]/[Your Level Name]-[Your Name].unity

Then, take the tools in the framework: the art tiles, the music selection, the level pieces for items and characters, etc.; and use the tips that guide you from this guidebook to begin building. You take a few steps building your level, **snapping tiles into place**, placing a some items, and then you play test from the Dojo Menu scene.

> *Tip: Players are able to play Pixel Dungeon Dojo either with keyboard and mouse, or with a standard game pad.*

To play test is not really about playing the level yet, but you do get to see what your players will see just by hitting the play button. You find things that work well, things that could be better, and you stop and go back to **make adjustments, additions and enhancements** to your level design.

If you just need a sword or a health potion while testing your level, just **hit the pause button and drag it in** while the editor is playing. No worries, this won't change your level design. When you stop play testing, any changes you made during runtime will be un-done.

Place some more tiles, a few more items, configure a door to open with a key, set monsters in place here and there, put treasure over there, etc. Then, **pause and play test** again to see how it's improving.

Design is making things better.

> *Tip: Review the provided dungeon levels, see how these were put together as an example, and find Dojo Gizmo Tip objects that point out features to focus on.*

The Pixel Dungeon Dojo just takes the more time-consuming and technical issues out of the way, with tools that are **helpful, simple and do what you need** just by dragging it from the Prefabs folder, placing it into your level scene, and configuring it.

Pixel Dungeon Dojo is cozy Level Design.

We encourage you to **share your level creations with friends to play for free**, just by building the game and from the Unity editor and sharing it with them. We also encourage sharing level designs with friends who have their own copy of Pixel Dungeon Dojo, by exporting your dungeon folder as a tiny package file.

Design. Create. Build. Play. Share.

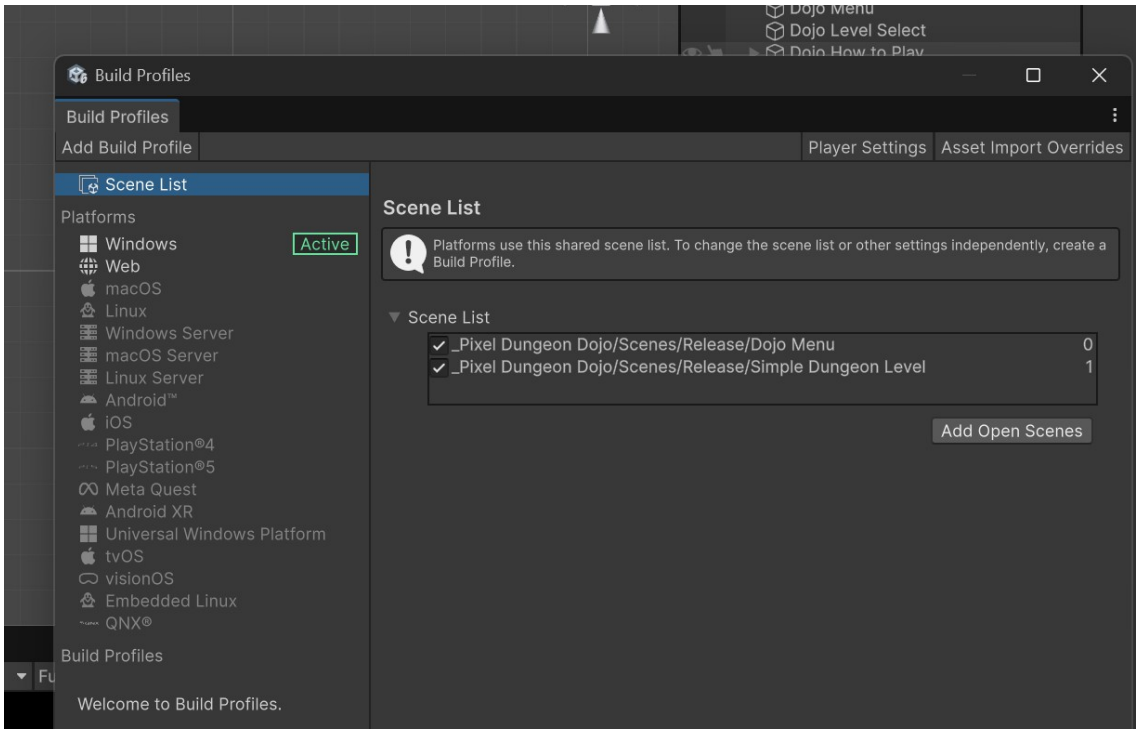
Beginner's Quick Start

To take your first steps, and learn how Pixel Dungeon Dojo is used to make your own levels. If you've already got the Pixel Dungeon Dojo package installed in a project, you could **start by playing the game**.

First, make sure the Dojo Menu scene and Simple Dungeon Level scene are in the Unity project build settings, and with the Dojo Menu scene open, hit **Play**.

To configure the Scene List in the Unity project:

1. “File” → “Build Profiles...”
2. In the top left corner of the pop-up window, click on Scene List.
3. In the Project panel, find the Scenes folder and open the Release sub-folder inside.
4. You should see both “Dojo Menu” and “Simple Dungeon Level” there, drag and drop each of those into the box labeled Scene List.
5. You should see these two levels in the build profiles Scene List now. So, you can play.



These steps allow you to play, see the game system in action, and **experience what the player does**.

You now know how to put your own levels in the game, because placing your level into the Scene List will do it. **The game will recognize your dungeon** folder if it is inside any folder called, “Scenes”, and your level uses the naming convention, “[Level Name]-[Your Name]”. If so, the menu shows the player a button for your dungeon, and your name in the credits just like the other dungeon levels.

You may have noticed there is a sample dungeon available in the Scenes folder, with seven levels. After you've played the simple dungeon level, go ahead and open the Scene List again, and drag in all seven levels of the **Sample Dungeon** one-by-one, in order. Now, hit Play again and notice this dungeon is now available in the Explore Dungeons menu, and the credits are updated to display the new dungeon levels as well. The order of the dungeon levels in the Scene List is the order they player will experience them.

This is how you can add your own dungeons and levels. But, maybe play a little more from the Dojo Menu scene, to see what the Pixel Dungeon Dojo gives you to work with as a level designer.

> *Tip: Being a player is an important part of being a good designer. Maintain a balance between what you work on in level design, and checking in to see what the player experience is shaping up to be; by being the player again and being honest with yourself about the results. This is the way to help improve your designs.*

Your First Dungeon

Let's get down to the practice of level design, and **using Pixel Dungeon Dojo** to make this easy.

Create a Unity Project

Begin with a simple, yet optimized, **3D Built-In Render Pipeline** project. Go to "File" → "New Project …", and select the template for "3D (Built-In Render Pipeline)". You may need to download this template if you have not yet done so. Consider naming this new project something like, "First Dungeon Levels", for convenience.

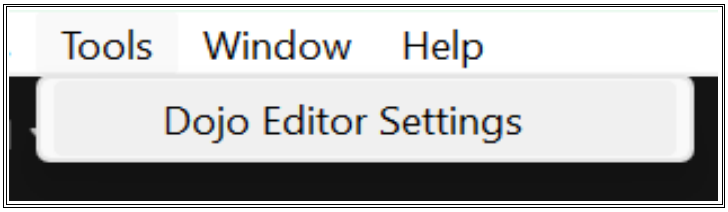
It may seem counter-intuitive to use a 3D project for a 2D game, but to put it bluntly, all Unity games are 3D. The difference you'll find is just the way the camera uses the space, and limits the Z axis to a depth the player will never see. Rather than using the new standard of a Universal Render Pipeline, you'll find that the 3D Built-In Render Pipeline project is **created quickly, loads fast, is a smaller size and builds an efficient game**. Pixel Dungeon Dojo is made to take advantage of this type of project, even if any render pipeline can be used.

> *Tip: Remember to take advantage of the pause button in Unity while play testing in the editor. Although any changes made while in pause are lost when the game is stopped, you have the opportunity to look at any object in the scene, all the detail configurations, and analyze anything happening in your level.*

Install Pixel Dungeon Dojo

The package you've purchased is **always available to install in any project** you make. Just open "Window" → "Package Management" → "Package Manager..." to find your copy of "Pixel Dungeon Dojo" to select it. Once selected the "Install" button will place everything in this new project.

This framework gives you a menu called, "Tools", with one button in it called, "**Dojo Editor Settings**". This one button will do two things behind the scenes: configure your project for making a proper game build, and configure the Scene panel view for working in 2D. Easy.



Set a Unity Layout for Dojo Level Design

The Project panel in Unity is going to help you **make your own levels**. The Hierarchy panel is going to show you what is in your level, and how these pieces are organized. The Inspector panel is going to show you what each piece is configured to do, with helpful property naming and tool tips along the way to make clear how your settings are going to work in the game.

It is recommended you use a layout that clearly displays all three of these panels at once, along with the Game panel and the Scene panel. A layout configured for working in the Dojo is provided in a file found in the folder “Scripts/Editor/Layout, called “**DojoLayout**”. It's a “2 by 3” layout, modified to make sure the Project panel appears plainly as the Assets folder of your project. Go to “Window” → “Layouts” → “Load Layout from File...”, and use the “.../Scripts/Editor/Layout/DojoLayout.wlt” file.

Make the Dungeon Folder

In the Project panel, in any folder called, “Scenes”, right-click and create a new folder. The folder name will be **the name of your dungeon**, so you'll want to think of a good name for the dungeon, and for your levels. (you can always start with “My Dungeon”, for this first one.

Make the Level Scene

Open the template scene found next to Dojo Menu and Simple Dungeon Level in the Release folder.

Use the menu at the top, “File” → “Save As...”, to **save your new level with a particular name**. The level's name, like the dungeon name, will be shown to the player, so you'll want to give it some thought. But also, you will need to include a hyphen between the level name and your name on this scene file.

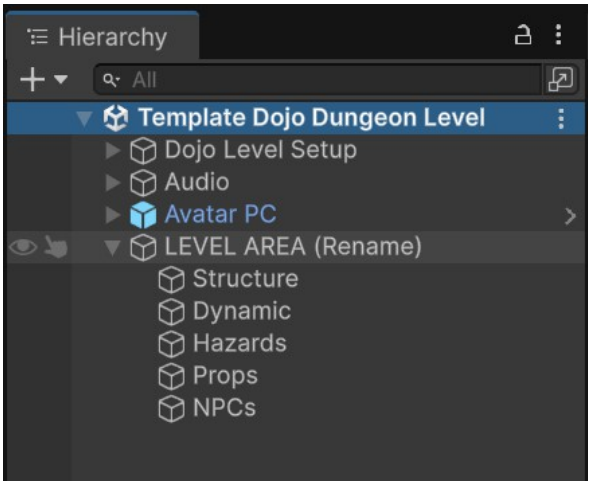
“My New Level-My Name”

This format of your level name will make sure the game understands this is a Dojo level, that should be **treated like any other level in the game**, with the ability to play, show high scores and display your name in the credits, as the author and level designer of the dungeon.

Remember to place your new level in this project's Build Profiles **Scene List**. See the *Beginner's Quick Start* above for a step-by-step guide.

Open the Area Folder in the new level

If you've used the template scene, your new level is ready to play immediately, even if it is blank. But, hidden in this scene are helpful tools that make this easier for you. The first and most important tool is the **folder organization**.



There is a prefab folder you can drag and drop into your Hierarchy panel to make new areas of your level, and stay organized. The folder is collapsed, and opens to show sub-folders in the scene, for Structure and NPCs and Props, etc. One of these is already in the template scene, so you should see it now; it's ready to be re-named as **the name of your first area** in your new dungeon level.

Name this folder in a way that **helps you remember** what this area of your level design is; ex.“Entry”.

Drag and Drop a Floor for a Room

The Project panel **Prefabs folder has sub-folders for all the items you need** to make your level designs, and we can focus on architecture now, starting with the floors. While we wouldn't want our dungeon to only have a floor, we can imagine the walls and other elements there and make quicker adjustments to the room size, its shape and potential entrances and exits.

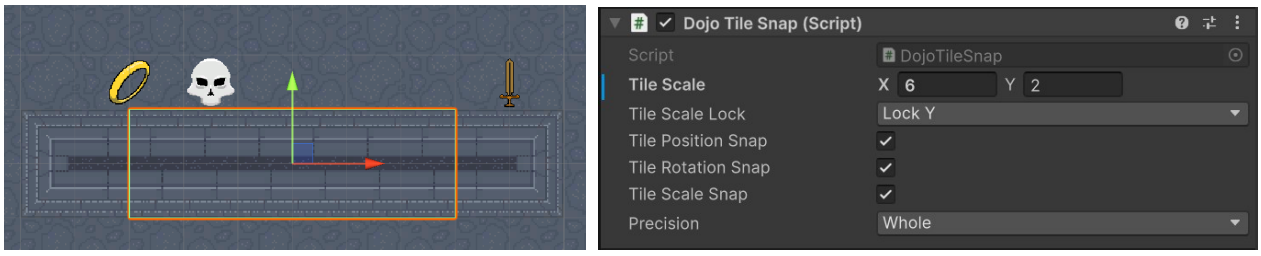
> *Tip: Consider working in a methodical way; using a method, a process. Finding a way that works best for you is part of the improvement a designer does. By finding more efficient and effective methods, the designer has more time and focus to spend on making things better for the player experience.*

Open the Structures sub-folder in Prefabs, and **open the Floors** sub-folder there. Drag and drop this prefab into the Scene panel or Hierarchy panel (either way will add it to your level), and use the translation gizmo to move it. There is a button with four arrows to translate, and the hot key is “W”.

You'll notice the floor tile 'snaps' along the grid as you move it, and it will always set on the grid. There is a tool on each tile piece and most level elements that help you keep items on the grid, called the Dojo Tile Snap.

Size and Scale with Dojo Tile Snap

Look over at the Inspector panel and see the Dojo Tile Snap component. Use this tile snap to scale this floor tile, instead of trying to scale it (the tool will also lock in place rotation and scale). The tile snap tool is consistent among the Pixel Dungeon Dojo elements, so you can become more efficient with it. By scaling the size in X and Y with Dojo Tile Snap, **the tool is also automatically scaling** collision and other elements associated with this tile. This is one of the primary ways the Dojo helps make level design easier and quite cozy to work with.



If you begin to work with these tiles and find an odd tile scale or position means the snap is out of place when putting two pieces together, **use the Dojo Tile Snap settings for Precision** to adjust from snapping to the Whole grid, to Half or Quarter. (no problem)

The Dojo Tile Snap also means **you may work quickly** and know that the snap will be there to help.

Make a Hallway and Another Room with Floors

Drag in new floor tiles, move them in place, scale them and allow tile snap to help. Get a feel for how this will work for you. Note that your folder is there to accept each new tile as you drag it into the scene. The area folder you've named has a sub-folder for Structure to **keep everything organized**.

It may seem unnecessary now, with only three tile pieces, but **levels often have many pieces** and staying organized along the way helps save time when you need to make adjustments and find things you want to work with.

Get in the Habit of Saving and then Play Testing

(for science, of course) You should also have **a routine of taking breaks periodically**.

> *Tip: Go ahead and set a timer for some interval that feels comfortable for you, maybe 15 minutes. When it goes off, save, reset the timer, and decide to either play test and/or take a break. Keep resetting the timer just to keep track. This is a productivity technique known as "time boxing"; and helps you stay balanced and efficient simply by being more aware of the time passing.*

Place Corners of Walls First

This suggested method may not be obvious, but **try it**. In the Prefabs folder, under Walls, find a Corner tile and drag it in.

Note that the corner wall, like **all walls, include shadow** meant to suggest the outside of the playable level. The corner can be used to sit just outside the floor area you've made, a block set off the floor to be a corner the player cannot move through.

If you drag in four of these corners, you can place them on corners of the first room floor and rotate them. The rotation gizmo is a button next to translation, and the hot key is E. Notice that Dojo Tile Snap **will help keep this rotated at 90 degree intervals**. If you learn the four orientation numbers: 0, 90, 180 and 270, you can enter these in the Inspector panel on your selection, under the Transform component's rotation in Z.

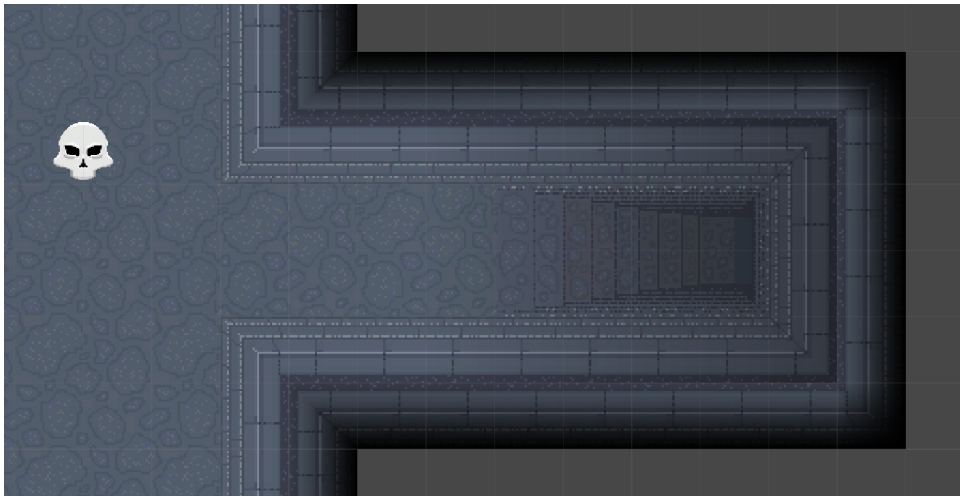
You might play test to see how pieces line up, and to ensure the room appears as you want for your player. If not, it's **easy to change** this, due to the small number of tiles and the helpful tile snap tool.

Configure Inner Corners

Not every corner is the same. Aside from rotating the tile, sometimes the shadow should be facing outwards but cannot. An "inner corner" is one that simply needs the shadow to move out, and we see those often in **corners leading into hallways** from rooms.

To make a normal corner tile shadow **appear correctly**, you can use the component Dojo Corner Shadow to set the shadow from the default “Outer” to “Inner” (or “None” when you have a wall within a room).

Entrances and Exits



Levels can have pleasing ways the player enters or exits, like the stone stairs available in the Prefabs folder. Within Structures, you'll find Stairs, and you may select Stairs Down or Stairs Up. Place a stairs up leading into your room, as if the player came down the stairs to enter. By default, up stairs are configured to allow the player to exit the dungeon, as if they've retreated and gone home. Down stairs are configured to win the level by default. **Stairs can be configured to lead to another level** by its name. These configurations are available in the Inspector panel while the stairs tile is selected.

You might play test, just because it's fun, but also to stay focused on what the **player experiences**.

Place Walls

Finally, we can fill in those gaps between corners. In the Prefabs → Structures folder, find a wall prefab and drag it in. By now you know the tile snap is helping to place and scale this piece, that shadows are on your wall, and **you can rotate the wall to make it appear correctly**. If there should be no shadow, open it and turn off the shadow. Remember you have the folder organization for this first area as well.

If you see tiles that don't line up, you may need to revise the scale of the floor, move the corners and try again. The **tile snap tools make revisions easy**.

Place Items and Treasure

In the Prefabs folder, you'll find Props next to Structures. Within Props, you'll see **lots of different items** you can drag and drop into your new level area. Try placing a few pieces of treasure, a sword or two, and maybe a potion.

> *Tip: All players like to discover loot, and consider that when you strive to balance what they find with the dangers you present to them, the player will feel the level design is 'fair'.*

Place Monsters

Time to think about how the player might be challenged. One of the primary ways this game challenges the player is through the simple combat system, and placing NPC enemies in your level is the most basic way to conduct **combat design**.

The number of enemies, their placement around the player, the way they approach, their delay or timing, all change the **combat experience** for the player. It is a very deep subject to explore. For now, place a few enemies.

> *Tip: Consider that the level design works within the game they design for. In that way, think of the fact that, in this game, a sword is consumed when an enemy is hit. You can therefore 'match' enemies with swords for a fundamental balance in combat design in your Dojo Dungeon levels.*

The only way to confirm your combat design is working, has balance, is a challenge, etc. is to **play test**.

> Tip: A powerful pattern to use in your practice is one taken from professionals. Level designers will show players something new, then again with an option to interact with it, then the player is tested with it before they can move on, and finally, the level designer is free to combine this new element with others and in creative ways, confident the player educated on it. This pattern of “Introduce, option, test and evolve”, allows you to organize how items, NPCs and elements are placed and sequenced so that players experience new things, feel smart and are challenged.

Place a Door and a Key

Let's try **one of the many dynamics** you can put in your levels: a door that is locked.

Within the Prefabs → Structures folder, you'll find Dynamics, where a Door prefab is available. Place this closed door in the hallway you made and rotate as needed. While it is selected, you can see the settings in the Inspector panel. Note that a door can **require a Key to open**, set this to “Gold”.

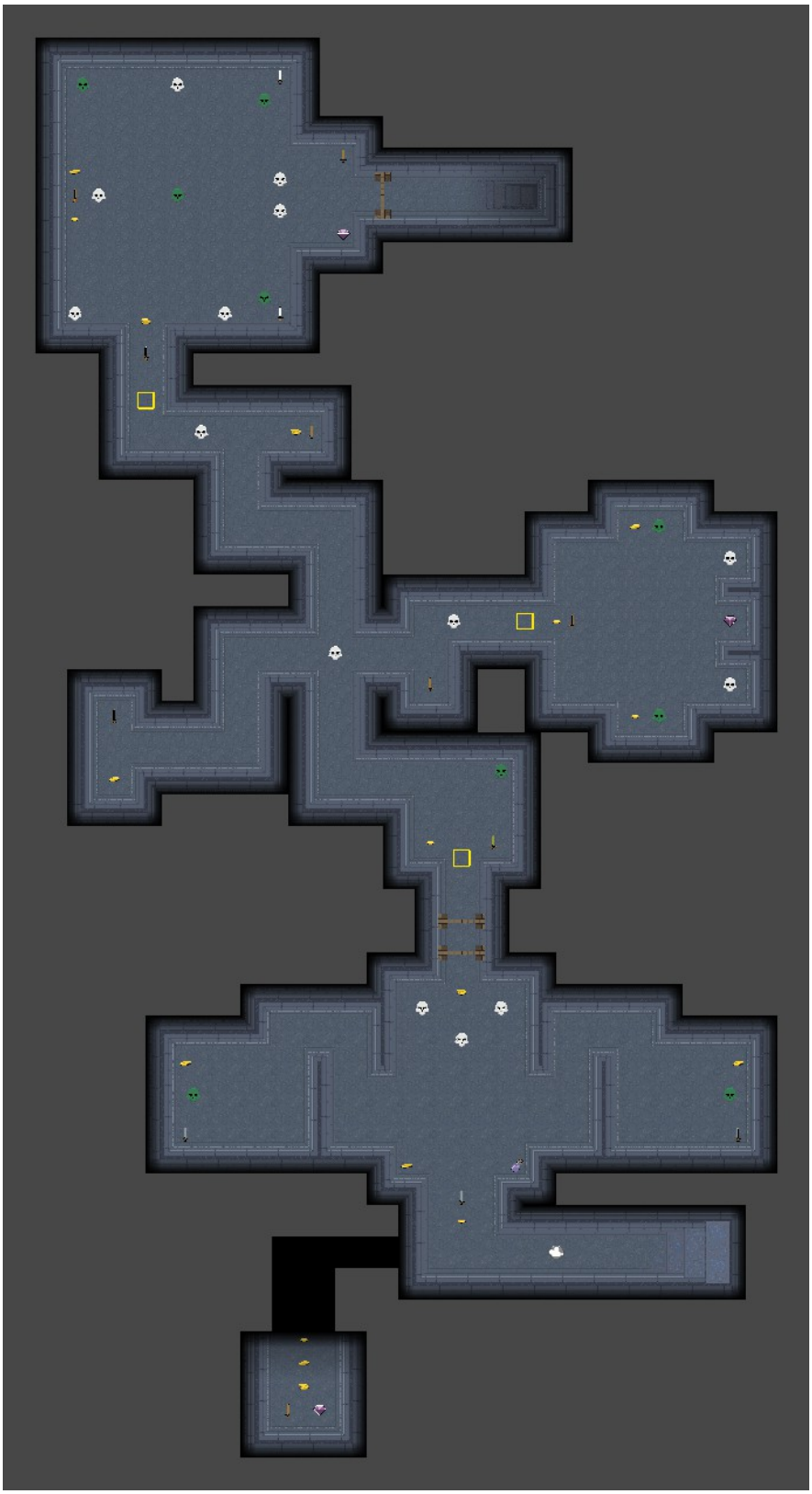
Of course, we'll need to **provide the player with a gold key** before they get to the door, so in Prefabs → Props, find the Key Gold prefab item, and place it.

> *Tip: When a player comes to a locked door, the game will provide a hint as to what color of key is needed. So, as the Level Designer, you can rely on this notice to the player and 'hide' the key a little more, knowing the player will be on the hunt for it.*

Beginning, Middle and End

While there is a lot to explore in the field of Level Design, this first level should be shaping up. And, this **step-by-step process should help** show you where to look for pieces, configurations and ideas.

> *Tip: The Sample Dungeon and Simple Dungeon Level are available with examples of various level design elements to work with. If you see something you like, find it in the editor and see how it is configured. And, remember to experiment with elements you haven't tried yet, and to always play test. Have fun!*



Dojo Dungeon Pieces

The following is **just some of the Level Design elements** provided in Pixel Dungeon Dojo, the ones to become familiar with at first. There are other prefab elements available, and some are used exclusively by the game system rather than being tools for your level designs. However, in the Component menu under “HIPTools” → “Pixel Dungeon”, there are multiple 'loose' tools available to use freely as you begin experimenting to grow and expand your Level Design skill set.

Level Area Folder

This is **the main prefab to begin a new level area** with; “LEVEL AREA (Unpack & Rename)”, is found by itself in the main Prefabs folder for that reason. To start a new area, drag and drop this folder into your Hierarchy panel, then right-click to find the menu item “Prefab >”. From there you'll find “Unpack”. This operation disconnects it from the original prefab in the project (for safety) and you can then freely rename this folder to be your new level area. (example: “Room 1”, or “Grand Hall”, or “Factory Floor”)

Use naming and organization patterns that work best for you, and then **stay consistent** with them.

> *Tip: Your level benefits from good organization, and so do you. While you begin to make larger or more complex levels, the amount of game objects in your Hierarchy panel will grow to a very long list. By making a habit of taking the prefab you just added from the Project panel, and immediately dragging and dropping it into an organized folder location, you're able to find what you need when you need it.*

Character NPCs

Non-player character monsters in Pixel Dungeon Dojo.

Skeleton

Move: 3 Health: 1 Loot: No

Damage: Physical Attack Pattern: None

This character moves slower than the player, and takes one hit before defeated.

Boss

Move: 2 Health: 3 Loot: Yes

Damage: Physical Attack Pattern: None

This character moves slower than the Skeleton, and can take more than one hit before defeated. (Default is 3 hits) This character, and all other Boss characters, can be configured to drop an item as loot once defeated.

Fire Boss

Move: 2 Health: 7 Loot: Yes

Damage: Fire Attack Pattern: Yes, with Projectile Fire x3

This character moves as slow as a Boss, has a default health of 7, can drop loot, and attacks the player in a pattern. During the pattern of attack, this character launches a projectile made of fire that explodes when it lands. This projectiles explosion causes an area of effect that damages in a radius around the impact point. This character is immune to fire damage.

Boss Attack Patterns

Boss patterns will vary, but will cycle to repeat the behavior. Including a pause and a charge toward the player and an attack of some kind. Bosses will perform this attack pattern when the player is within range to be noticed by the boss.

Ice Boss

Move: 2 Health: 7 Loot: Yes

Damage: Frost Attack Pattern: Yes, with Projectile Frost x3

This character moves as slow as a Boss, has a default health of 7, can drop loot, and attacks the player in a pattern. During the pattern of attack, this character launches a projectile made of frost that explodes when it lands. This projectiles explosion causes an area of effect that damages in a radius around the impact point. This character is immune to frost damage.

Ghost Boss

Move: 2 (4 in 'ghost') Health: 10 Loot: Yes

Damage: Magical Attack Pattern: Yes, with Ghost and Shout

This character moves as slow as a Boss until they perform the attack pattern, where they can become ethereal and 'ghostly' and travel as fast as a common Skeleton, moving through walls and hazards. This character has a default health of 10, can drop loot, and attacks the player in a pattern. Along with the 'ghost charge' behavior the attack pattern includes a shout; a large area of effect that causes one or more attacks to any within range. While in 'ghost charge' this character is immune to all damage.

Level Elements

The following level elements are used as part of **an array of trigger system components**, where one element can activate or trigger another, and so on. For more, see the section “Getting Started with Trigger Systems”.

Check Point

This element detects the player and **causes the player respawn location to change**. Once the player reaches another Check Point, the respawn location is changed again, and there is no inherit order to these; the player may back track or reach a Check Point in any order. By default, a level's entry point is the initial respawn location.

Dynamic Activator

This is a powerful element able **to activate or trigger more than one other element**, and it can itself be triggered by activation, collision or with a timer. This can also be configured to repeat the triggering of other elements.

Story Scroll

By default, this appears as a scroll item the player can pick up. As they do, a HUD pop-up appears **to present a small piece of story** text, with a title and the ability to close the pop-up. By default, the text will appear word-by-word, but the player always has the option to skip that operation to display the text all at once. This can also be configured to only display all at once. This has the option to be picked up only once, or to be automatically dropped and left behind, able to repeatedly be picked up again. Text that is configured can include the character sequence, “\n”, to cause the text to include a new line.

> *Tip: Test story text to ensure the text is not too long, has no spelling errors, appears the way you want it to, and is understandable to your players.*

Timed Spawner

This element is made to wait a configured duration before **spawning a prefab element at its location**. It may be configured to repeat this spawn action, and it can be configured to limit the total number of spawned elements; where it will continue to respawn new elements if previous ones are destroyed. By default, a visual effect and sound effect will be presented at this location when the element is spawned.

Prop Pickup Items

These are elements meant to be seen by the player as **items to acquire and collect**. Unlike the story scroll, these elements are either consumed upon pick up, or are otherwise collected as valuable score or items to be held in inventory and used elsewhere.

Keys

Keys are made **to open locked doors**. Keys have a color that matches the door lock hint that a locked door will present to the player. The available color of keys are: Blue, Gray, Green, Gold, Purple, and Red.

Potions

Potions provide the player with **effects that benefit them in some way**, indicated by the color of the potion. The available potions are: Health, Speed, Invulnerability, Fire Resistance, Frost Resistance and Ghost. Invulnerability means the player can take no damage from attacks. Fire or Frost Resistance means the player can take no damage from attacks of that damage type. Ghost means the player is able to move freely through walls, doors, NPCs and items; unable to pick up or effect the 'physical' world. However, if they wield a sword, they are able to attack NPCs with it, even while in the Ghost effect. If a player's Ghost effect ends while they are inside a solid item or structure, or are outside the level entirely, they will be reduced to zero health instantly, and respawn.

Potion Effects

The potion of healing takes immediate effect, while all other potions have **a lasting effect** with a duration of 15 seconds. Just before the effect wears off, the player avatar will flash to help the player understand this effect is about to end. Potion effects can be carried together.

Swords

The swords are the player's means of conducting combat. Swords appear as different metals, in different colors, indicating their relative strength or **sword power**. The varieties of swords, in order of sword power, are: Copper, Iron, Steel and Vorpal. All swords to physical damage, except the Vorpal sword, which is magical.

Treasure

The treasure collected by a player translates into the points scored in the game, along with each hit on enemy NPCs. **Each treasure element has a relative value** for this score. The varieties of treasure, in order of value, are: Single coin, Double coin, Triple coin, Ring, Necklace, Scepter, Crown and Gem. There is a special treasure item, the Gem Win, that doubles as a level end trigger. Gems are able to be configured just as the Level Exit element.

Structure

These are tiles of architecture that provide **the basis for level design**, with all the visual and 'physical' elements to hold the player within the game level bounds and act as the setting the player finds themselves in.

Dynamics

These are special structural elements **meant to change** or provide a hazardous area in the level.

Door

This wooden door may be configured to be opened freely, or require a particular key by color, or require a trigger signal from another element. The door can be configured as open initially, or to be changed only once.

Lava Pit

This is a hazardous area that immediately damages players, NPCs and dynamic props with fire damage.

Pit Fall

This is a hazardous area that will cause players, NPCs and dynamic props to fall endlessly and be removed. Players will then respawn.

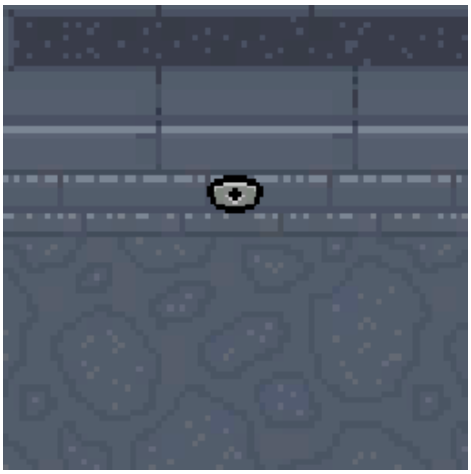
> *Tip: While a lava pit will immediate hurt a character or dynamic prop on contact, the Pit Fall needs to appear the element has fallen, meaning it must be all the way off the edge of solid ground; otherwise it appears unfair to players. The Pit Fall collision is the touching point where falling begins, so set this smaller and away from the visual edge of the ground; one unit away. You can also add visual effect Lighting as shadow tiles to help the player understand this is a ledge to a pit fall hazard.*

Pressure Plate

This is a space on the floor that accepts 'physical weight' from players, NPCs and dynamic props, where the result it the plate lowers to trigger other level elements. More than one element can be holding the plate down, but when no other valid elements are detected, it returns to a raised plate position and will un-trigger those elements it had effected. A pressure plate can be configured to trigger only once. It can be configured to repeat and toggle the other element it triggers.

Wall Shooter

This element appears as a hole in a wall, with a metal frame around it. When triggered, this launches a magical bolt that damages players, NPCs and dynamic props.



Wall Switch

This is an element players will recognize as a way to trigger other things. It appears as a switch that can be in one position or another, and it moves as the player collides with this element. This element will trigger another element, and can be configured to trigger once only, or to repeat and toggle.

Floors

This is the basic tile element indicating **solid ground** the player, NPCs and dynamic props can be on.

Stairs

This element helps the player understand **the start and end points of levels**. The stairs up are configured by default to allow players to 'retreat' to the menu. The stairs down are configured to win the level and go to the menu. Stairs can also be configured to block the player entirely, or to win the dungeon, meaning that they will be presented an additional announcement for this achievement. To use the stairs as a portal to the next level, configure the Level Name to match.

Walls

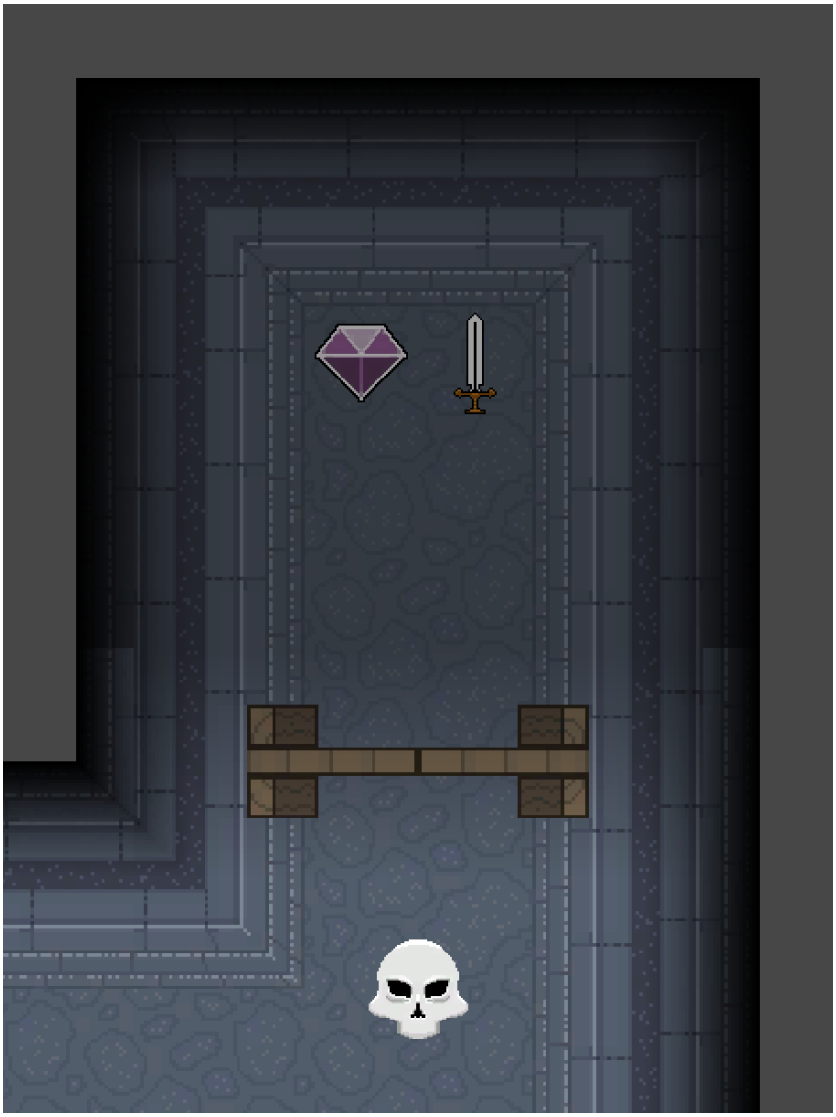
Various tile elements are provided to accommodate many level designs, **including the shadows** that help the wall to appear to be on the edge of the level outer bounds. To effectively use these tiles, make use of the Dojo Tile Snap component to scale them, and find the other components for Corner Shadow for details that simple rotation of the tile cannot accommodate. In cases where no shadow is desired on the tile, simply un-collapse the game object to find the shadow as a child object you can deactivate. The varieties of wall tiles include: Cap, Corner, Cross, T-Corner and Wall. If you find the position of the tile cannot match while snapping, use the snap component Precision property to switch from Whole to Half or Quarter unit precision.

Visual Effects (VFX)

These are special tiles meant to provide the Level Designer with **finer detail appearances**.

Lighting Tiles

The lighting tiles include overlays that are meant to appear above the other structure tiles, and color them appropriately for the visual aesthetic desired. There are shadows, the same ones used by default on wall tiles, that appear as black or dark semi-transparent tone. There are also light tiles, designed to be used the same way, but then **colored as desired** by configuring its Sprite Renderer component. The varieties of Lighting tiles include: Corner, Full, Half and Invert. Full covers a rectangle you can position and scale as normal. Corner and Invert are available for detail edges. Half tiles appear as a gradient from the full color to transparent, allowing a subtle visual transition.



Getting Started with Trigger Systems

Trigger systems allow our level to **react to what the player is doing**, in a way that makes the level 'come alive'. When you have trigger systems in your level, the switch can open a door, the pressure plate can activate a wall shooter, a steel sword spawns when the player reaches a particular location, etc.

A trigger system is **more than one level element working together**, connected by configuration and set up to perform some behavior when some condition is met. In other words, you make up a rule about what happens and how or when it happens, and a trigger system can be set up to make sure the level does exactly that.

Common Elements to Use

The elements players notice and use most often are the wall switch, pressure plate and door key. These are obvious visual elements that give the player the basic information that this element is **made to trigger** something else.

The more obvious elements that are **reactions to triggers** include the wall shooter, door and story scroll. When one obvious element is connected to the other, the player learns how this trigger system works, and tries to play while using that.

More Trigger System Elements

Less obvious, but very powerful, trigger system elements include the check point, the timed spawner and the dynamic activator. Let's focus on these and **learn more**.

Check Point

A check point is a silent trigger that tells the game to respawn the player at that point. When placing a check point, **care should be taken that the player cannot be stuck** without the means to proceed if they respawn there.

Timed Spawner

A timed spawner is available to **spawn items or NPCs** in that particular location, and at a time from the activation of the tool. That is, once something else triggers this spawner, a delay can be used before the item or NPC is spawn. Also, a timed spawner can be configured to only have a number of those spawned elements in the level at any given time. And, the timed spawner may be configured to continuously respawn using that timed duration, and keeping them total number of spawned elements within range.

Dynamic Activator

A dynamic activator is the mother of all trigger system elements. It acts as the relay from signal to reaction, and **can activate or trigger a number of different elements**. The dynamic activator can be configured to be triggered on a timer, or by the player or other solid element collision with it, or by

another trigger system element activating it. And, the dynamic activator can be configured to trigger more than one element. It performs the role of trigger with lots of flexibility, and it performs the role of an event manager, able to effect multiple level elements at once.

Going Further with Trigger Systems

Very **sophisticated trigger systems** can be made using these modular elements, configured to work together.

Any trap will use a trigger system, of course, but consider that combat designs can also benefit from using trigger systems to make the combat situations more dynamic; as in timed waves of monsters, or an ambush attack of spawned NPCs when a player takes nice-looking treasure.

Puzzles are a classic challenge for game designers. Making a player performance difficult, but not too difficult to solve, is the challenge for the designer far more than for the player. The key components of a puzzle include things the player can plainly see, but do not have the idea or context to put them to use. Once the player does get the idea, they should feel smart; that's the mark of a successful puzzle.

> *Tip: A neat trick to puzzle design begins at the end. A solved puzzle, a satisfying result, can be imagined first, and then broken into pieces; pieces that would logically fit (or visually fit, or sequentially fit, etc.) but they are then scattered before the puzzle is needed to be solved. The pieces found by the player (such as a wall switch that appears to do nothing) will be an oddity that eventually will be left behind, if another is encountered, the first will be remembered, but without context, the player will leave that as well. Finally, at some result, like a series of doors, with treasure on the other side, the player will think about their options and have to consider the wall switches as possibly connected. They will feel smart.*

A trigger system used for **a puzzle should be carefully planned first**; even with paper and pencil, to make note of the details that matter to the logic of the puzzle, and to the satisfaction of the player.

> *Tip: Combining the ideas of puzzle, trap and monster in various ways can lead to creative level design ideas to surprise and delight your players. Perhaps a monster springs a trap, or a puzzle solution spawns a monster, or a trap needs to be sprung to solve a puzzle.*

When working with trigger systems, and one element is triggering another according to a rule, you're working with rule systems, sets of rules working together. The rules are commonly known as game mechanics, as they work mechanically, as if made of metal machinery. And, the resulting systems you make are **a form of systems design** that is the basis for all games, and game dynamics.

Experimentation and testing, trial and error, evaluation and revision are the ways to grow as a systems designer, and **you now know the way** forward.

Level Design Challenges

The following are suggested ways to **challenge yourself as a Level Designer**, once you've had a fair amount of experience working with Pixel Dungeon Dojo and sharing your levels with players to get their feedback.

> *Tip: It is important for all Designers to use the feedback they can get to help them make their designs better.*

Push Me Pull Me

This is a challenge to the make level that plays well one direction, and can be played just as well going backwards from the 'end' back to the 'start'. The typical progression of challenge in a level design needs to be maintained even if the player is proceeding backwards. The designer's challenge is to make the level progress appropriately and somehow still surprise the player while going backwards; bonus if the same player can play the level in either order first, and still find both satisfying.

Spell It Out

Create a level design layout based on the shape of the letters that make up your initials. Bonus if the player cannot quite tell the shape spells letters until the end. Super bonus if you use the Dojo Camera Zoom tool to reveal the letters at the end, using a trigger system of some kind.

Headphones On

Create a level with the music trigger set to None, and use custom audio objects (game objects with Audio Source components) to highlight the level areas with sound. Source sounds you find (suggest Freesound.org) and consider triggering them with trigger systems rather than loop. Configure the audio objects more toward spacial blend of 3D sound and set their falloff to Linear, to make configuration easier. Bonus if the sounds you've selected are able to help players escape the level or solve a puzzle.

Frenzy

This is a combat design challenge to come as close to frustrating the player as possible through combat difficulty. Rather than overwhelm the player with enemies and no swords, your challenge is to very finely balance the two, and still make the combat achievable. Bonus if your player do not win immediately, but are eager to replay and try again, because they feel they can win.

Home Sweet Home

Create a dungeon level based on your home, a familiar layout, shape and contents, even if it looks like a 2D dungeon. Feel free to be very accurate with your home measurements to help you, and sketch a floor plan to guide you. Bonus if a family member or friend can answer the question, *“Does this level remind you of a particular place?”*, when asked.

Design Principles

This is a small collection of ideas to keep in mind as you consider ways to improve your designs. One might think of these like **a lens you look through** to see in ways you hadn't seen before, or to remind yourself of perspectives that will help generate ideas, refine details or satisfy more players.

Design = Art x Science

When we said, *"Design is making things better"*, we're summarizing a broad topic about how to approach design. It turns out, science does the same thing, through the scientific method. This is why we've been talking about testing so much. Art is of course also involved, because sometimes to find our way, we need the creativity to imagine anything. Design uses both Art and Science as multipliers. We gain a lot of insight and potential with the lens of Art, but we can verify things work and come closer to the needs of our player through Science. **It's both**. Design = Art x Science.

Design Tenets

These are **basic ideas** that all Design can utilize. These are broad concepts that apply to any kind of design and always help make things better.

- **Variation**

  It can be any alteration from one point or one time or one idea, to another. When it's there, variation creates interest and demands some level of attention.

- **Contrast**

  A form of variation that leverages an extreme, and again, can take many forms. Contrast keeps one extreme cleanly separated from others, and produces clarity.

- **Rhythm**

  A repetition with some amount of predictability, perhaps in time, or in space, or of a kind or shape. Rhythm leads to a comforting sense when the pattern is recognized.

- **Progression**

  Any kind of progressive or regressive change that may be predictable or understood more clearly in hindsight, again, in time, space, color, etc. Progression is experiencing change.

Level Design Principles

The following are **specific principles meant to help design that deals with space** that people or characters inhabit, and design that deals with dynamic change in a play environment. As you work on your level designs, notice when these principles could help, try them out, and refer to this list when you feel something might be wrong or missing. Design is a practice, and we grow as a result. Have fun!

- Work from large to small

  This encourages the designer to begin with the larger ideas, the larger pieces, the immovable elements of the design first, and fill in smaller and smaller elements around it. Going the other way around often causes time-consuming issues that require reworking the design.

- A sketch on paper with your finger as the player saves time

  Speaking of saving time, Level Design is a great place to practice rapid prototyping. A prototype is a test, where you look for results to evaluate and improve the design. A rapid prototype simply means only do the work necessary to do the test and get an answer to the most important question you're facing. Creatively, you can make a test and get an answer by stopping yourself from doing a lot of work, and asking, “What is a simpler way to see if this idea works better or not?”. The classic example is sketching your level layout on paper; even just using lines for hallways, boxes for rooms, at first. And, then using your finger to 'walk' through the level and imagine how this will be for the player. See something that needs to change? That's very, very quick with this format, as compared to building the level first to test the rough layout.

- The frame of the view port is the Level Design canvas

  This is a reminder that while the Level Designer is often concerned with the entire level, the player is usually only aware of one small part of the level at a time: the frame. You help yourself by drawing a box that represents the size of the frame on your level design sketch, because the trap you're avoiding is assuming the player knows things they've never seen that are off screen.

- The architecture changes as the player moves through the level

  Continuing that thought of the frame, consider this subtle, but important, fact about the perspective of the player. As a player moves through the level, and their view of this level from where they are changes, their perception of the level shape, distances between things, elements that come into view or go off screen, makes the level appear to change as if it's moving. Of course, the level layout is static, but it's this dynamic view that the player provides, along with other level dynamics you craft in your design, that the player will experience as change. Imagine you've been walking down a long narrow, very tight, corridor, and as you continue, it opens up wider, and wider until it becomes a large cavern where the walls are no longer in view. This is a static layout that the player has experienced changing from tight to open.

- To find balance, try extremes first

  You might be deciding on a detail setting on a tool, or your might be trying to find a balance in the amount of swords versus enemies in combat, or your might be stuck trying to decide how big a room should be. Whatever the balance issue is, one method of moving forward, to test and find your way through evaluation, is to intentionally overdue it to one extreme, and then the other. Not sure if it should be four or five skeletons in this room? Try 15 and see how bad it really is, then try 12, then 8, and see if it's becoming clearer where the upper amount is. Then, go for one, then 3, and see if you can find the lower limit. Somewhere between them is the right balance, so try that when you can.

Cheat Codes

Did you know that **cheat codes were made for the design process**? During development, game designers and level designers would need to test, and getting all the way to a boss level to test their attack pattern, for example, takes time away from making the game better. Cheat codes were made to get designers past the normal player challenges so they could interact with the particular part they needed to work on.

Pixel Dungeon Dojo gives you **cheat codes that work with keyboard or gamepad**, so that you have these available to test with, and along the way you'll notice how helpful it is to use these cheats during your level design practice.

Pixel Dungeon Dojo Cheat Codes

These cheat codes are available if you **begin a game from the Dojo Menu** scene.

You may configure your dungeon to prevent cheat codes from being used. In the "Dojo Level Setup" object folder on your entry level of the dungeon, configure the "Dojo Level Tester" tool to "Prevent Cheats". The entire dungeon will then be configured to deny the player from entering cheat codes.

Extra Health

Player avatar is awarded one level of health.

Keyboard: "imhurt" Gamepad: dPadUp, dPadUp, dPadDown, dPadUp, A button, A button

Extra Sword

Player avatar is awarded a vorpal (magic) sword.

Keyboard: "ifight" Gamepad**:** dPadLeft, dPadRight, dPadLeft, dPadRight, A button, B button

Open Doors

All doors in the level are opened.

Keyboard: "sesame" Gamepad**:** dPadUp, dPadDown, dPadLeft, dPadRight, X button, Y button

Remove Enemies

All enemies in the level disappear.

Keyboard: "thanos" Gamepad: A button, L Shoulder, R Shoulder, dPadLeft, dPadRight, A button

Skip Level

The player avatar switches to the next level in the current dungeon.

Keyboard: "moveon" Gamepad: dPadRight, dPadRight, dPadRight, X button, Y button, dPadRight

Making Custom Level Elements

Pixel Dungeon Dojo is designed to make **everything available to you** immediately. However, if you have the patience, you can extend your level designs to include your own artwork, animation or code!

Pixel Art

Try making a **decoration for your dungeon level**, like spider webs, a crack in the stone, a puddle of greenish water or anything you think would make a simple wall, corner or floor look varied in your level.

The standard used in Pixel Dungeon Dojo is **a 64x64 image**. These are imported as Sprites, with "No Filter", to prevent blending and keep the appearance of pixel art. Any drawing program can make a .png file that includes an alpha channel, so clear pixels are also part of your sprite image. A free program called GIMP is open source and able to perform things like making separate layers of your image.

Did you know that **all game art is square**, and that the dimensions are always a power of 8? The reasons are technical, but the summary is that this makes the game build smaller.

> *Tip: Pixel art may seem difficult and time consuming to make individual pixels appear to blend from one color to another. Try this method: start with an image that is not a power of 8, but larger, like 100x100. Draw your artwork, then before exporting it, copy it and resize the image to 64x64. Suddenly, all that difficult blending is done automatically.*

As a test, **draw something with a rough outline in black** on one layer named "Line", use a separate layer behind to "Fill" with a solid color, another layer on top of the fill to add a darker color of "Tone", and a last layer to add a lighter color of that fill we could call "Highlight".

If you put the **line layer on top**, with highlight below, then tone and last fill, you can export this as a .png file and import to Unity using "Assets" → "Import New Asset...", and select your .png file. (almost any image file type will do, but .png files are a standard)

With this asset in your project, you can select it and **configure the Import Settings** for it in the Inspector panel. You can refer to other Pixel Dungeon Dojo sprites as a guide, but in short: "Texture Type" is "Sprite (2D and UI)", the "Sprite Mode" is "Single", "Pixels Per Unit" is 64, and "Filter Mode" is "Point (No Filter)".

Any changes and **revisions are easy** if you just go back to your paint application, now that you've seen what it looks like in Unity. When you're ready for a new version, you can delete the old one in Unity and re-do the "Import New Asset..." process. Even if deleted, Unity will keep all the connections this image had with other assets in the project.

Animation

If you've tried your hand at making static pixel art, and you're ready for a challenge, try animation with the same paint program. You can **use separate layers for individual frames** of animation. To start, keep it simple, and keep it short; like 3 or 4 frames. (this is known as "limited animation", and if timed to show the frame for around 0.25 seconds, it looks like other Pixel Dungeon Dojo elements)

Like the pixel art process described above, you can end up with animation frames that have fill, tone, highlight and line layers. Again, to **keep it simple**, you might first just try a single fill layer for each frame. Later, you can add layers for line, etc.

> Tip: When using layers to make animation, consider that the common opacity setting on a layer can help you see what the previous layer looked like, as you draw the current one. This faded image can help you keep the next frame appearing to move smoothly. You can also turn layers on and off to peek at a layer as you work, to check on how they appear when animating.

Animation can be a time-consuming process, but the **results are impressive** to your players, and you will learn a lot. If you're feeling brave, try making visual effects like a torch flame or dripping water. If you're ready for a real challenge, try a limited animation character run that can loop.

Level Dynamics

Ever wonder how things like doors, switches or wall shooters work? In short, it's code. And you can start to use these custom art elements and animations in **level dynamics of your own**.

Imagine you've made a gate animation that can appear to open. This can work exactly like the door element Pixel Dungeon Dojo already gives you, it just looks different. **Switching out the frames in a door** you've placed in your level is easy, once you have the frames of your gate animation in the project. Suddenly, your custom pixel animation is part of the level dynamics.

To go further with it, and make something that works with Pixel Dungeon Dojo is not as hard as you might think. Consider that a Dynamic Activator tool is made to **activate game objects**. If your custom code is simply turned on, and does cool stuff, like enable a Deco Animator tool, or play a sound, you can see this work with existing Pixel Dungeon Dojo tools.

Going Even Further

While Pixel Dungeon Dojo is not designed to be used by those who code, **those who code can figure out very creative ways to extend** Pixel Dungeon Dojo. Start by reviewing the tool set provided, and studying the properties and terms used in tool tips and this documentation. What you have is a framework, and beyond switching out pixel art frames or sounds, you have the ability to use these tools alongside your own custom characters, combat systems or menus.

If you do extend Pixel Dungeon Dojo for **your own personal experimentation**, that is welcome and fine. However, Pixel Dungeon Dojo is not available to be released for commercial purposes in any form; please see the license agreement details in the readme file for more.

Pixel Dungeon Dojo is designed for **cozy level design practice**, and the hope is that you have fun with it.

Sharing Your Level Designs

Above all, Pixel Dungeon Dojo was made to give you the ability to **create and share** your level designs with friends and family. Whether you give these to someone who has never played this kind of game before, or they've professed to be a professional gamer, you are encouraged to share these levels you make, and let them see what you can do.

> *Tip: Always take the opportunity to gather feedback from players. The very best way to do this is to carefully, and silently, observe their gameplay without interference. You learn a lot about how players behave when you do this. The information you get will absolutely help you make better level designs.*

Share the Game

The **easiest way** to share is to build the game. With the one-button solution provided in the Unity editor, “Dojo Tools” → “Configure Player Settings”, you're ready to build the game.

Go to “File” → “Build Profiles” and **confirm all the levels you want to share** are listed in order in the “Scenes List”; which is found on the top right of this pop-up window. If everything is there, you've probably already been play testing with it anyway, but you're just making sure it's ready to build.

Click “Build”, and select a location to put this game, perhaps on your Desktop. You'll need a folder to put it in, and you might just name it, “My Dungeon Levels”. Once selected, the game should **build quickly**.

That's it. If you're at that location on your computer, open that folder to find the Pixel Dungeon Dojo application. It's recommended you **make a shortcut** for this application to make access easier.

The full game is going to be over 120MB, so you may want to physically share it on a portable drive. All they need to do is copy that folder, and double-click to play. **You just made a game** in Unity!

Share the Levels

For friends or family who also have purchased a copy of Pixel Dungeon Dojo, you may be able to do something **even better**. Sharing levels between friends is one of the best ways to learn level design, and it's wildly fun to challenge each other in your practice.

In your Project panel, select individual levels, or the single dungeon folder you want to share. Then, right-click and select, “Export As Asset Package...”. By default, Unity wants to include everything but this is unnecessary, so **un-check both check boxes at the bottom** of this pop-up window. Un-check, “Include dependencies”, and un-check, “Include all scripts”.

Name your Unity package file and place it somewhere you can find, like the Desktop. It takes no time and the resulting file is so small you can easily **attach it to an email**. Your friend need only download it, and in Unity, go to, “Assets” → “Import Package” → “Custom Package...”, to load your levels. Easy!

> *Tip: Play is an important part of learning and growth. To create is an even higher form of human progression. To share might be the most valuable act we can do. Please enjoy with friends.*