Layers and Sorting Layers

Using Layers and Sorting Layers

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Layers

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What Are Layers and How Are They Used?

Layers in Unity allow you to define how GameObjects can interact with Unity components and each other.

A common use is on Cameras to only render objects that appear on defined layers (specified in the Cameras culling mask)

Another use for layers is in Physics to specify which GameObjects collide with each other.

At a project / game level you can specify which layers (and GameObjects on those layers) collide with each other in the Project Settings - > Physics 2D Layer Collision Matrix)

Some class methods allow you to specify a ‘Layer Mask’ that determines which layers the processing for the method should be applied to.

Layers and Sorting Layers

How Do I Create Layers?

In this game we have already set-up the layers we need in the 'Course Assets Walkthrough' lecture using a TagManager preset asset supplied with the course assets.

To create (or delete) your own layers you use the 'Layers' drop down in the Unity editor. Up to 32 layers can be created for use in a game (which includes the built-in layers and user defined layers)

Every GameObject is assigned to a specific layer. When you create a GameObject it's initially assigned to the 'Default' built-in layer. The layer assignment can be changed for the GameObject in the inspector.

Layers shouldn't be confused with 'Sorting Layers'! We'll talk about those next...

Layers and Sorting Layers

Sorting Layers

Layers and Sorting Layers

What Are Sorting Layers and How Are They Used?

Sorting Layers are completely different to Layers and shouldn’t be confused with them!

Sorting Layers are used to define the order in which 2D renderers (like the Sprite Renderer and the Tilemap Renderer) are drawn.

Sorting Layers are also created using the ‘Layers’ drop down in the Unity editor. We have already set-up the sorting layers we need in the ‘Course Assets Walkthrough’ lecture using a TagManager preset asset supplied with the course assets. Sorting Layers are drawn in the order they appear in the list.

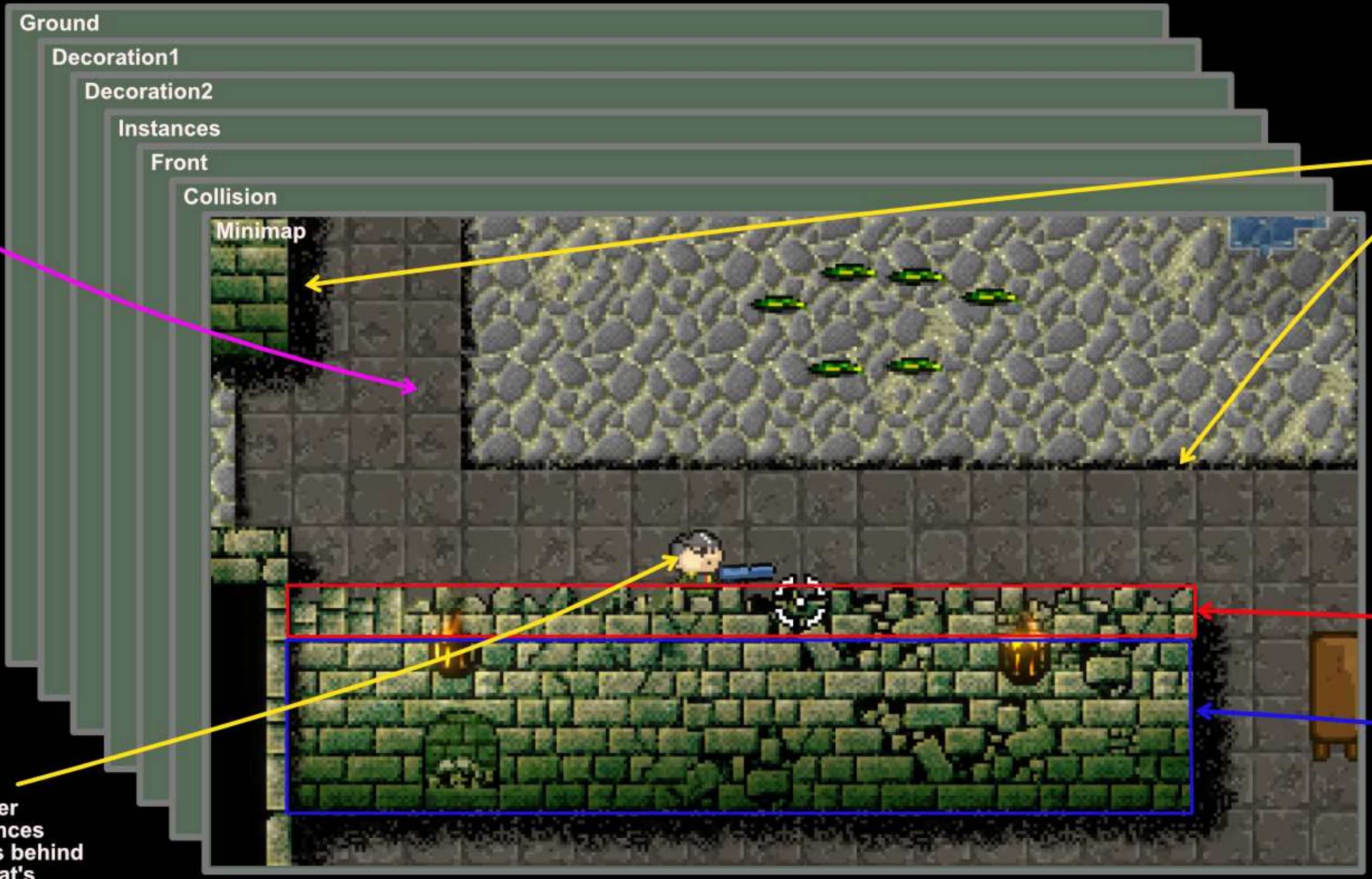
In 2D Renderers you set a Sorting Layer to specify draw order. There is also an ‘Order in Layer’ number field to specify the draw order within the same Sorting Layer (higher numbers get drawn on top of lower numbers).

There are also 2D Sorting Group components that can be used to draw child renderers together – we’ll discuss these as we use them.

Finally, we have already set a custom ‘Transparency Sort Axis’ in our ‘Project Creation’ lecture in the URP rendering settings. Most 2D renderers (like the Sprite Renderer) are added internally by Unity to the ‘Transparent Render Queue’. This queue first uses the ‘Transparency Sort Axis’ when rendering. We have set a custom sort axis to render based on Y axis position – so that things drawn at the bottom of the screen get rendered on top of things drawn at the top of the screen.

Using Sorting Layers In Tilemaps

Sorting And Tilemap Layers



The ground tiles are drawn on the tilemap with the Ground sorting layer specified

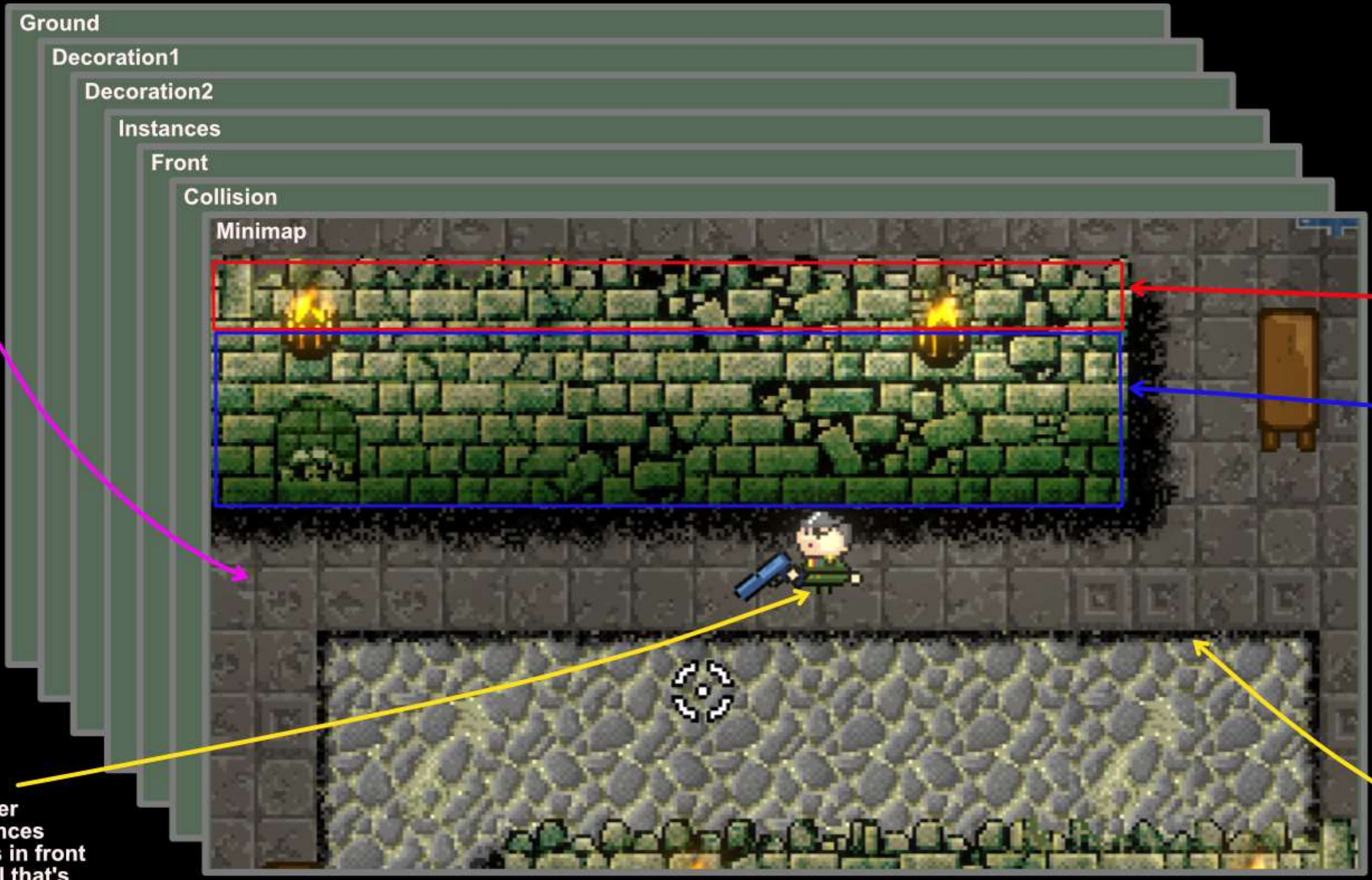
The ground shadows are drawn on the tilemap with the Decoration1 sorting layer specified

The top part of the wall is drawn on the tilemap with the Front sorting layer specified

The bottom part of the wall is drawn on the tilemap with the Ground sorting layer specified

The Player character is drawn on the Instances sorting layer - so appears behind the top of the wall that's drawn on the Front sorting layer

Sorting And Tilemap Layers



The ground tiles are drawn on the tilemap with the Ground sorting layer specified

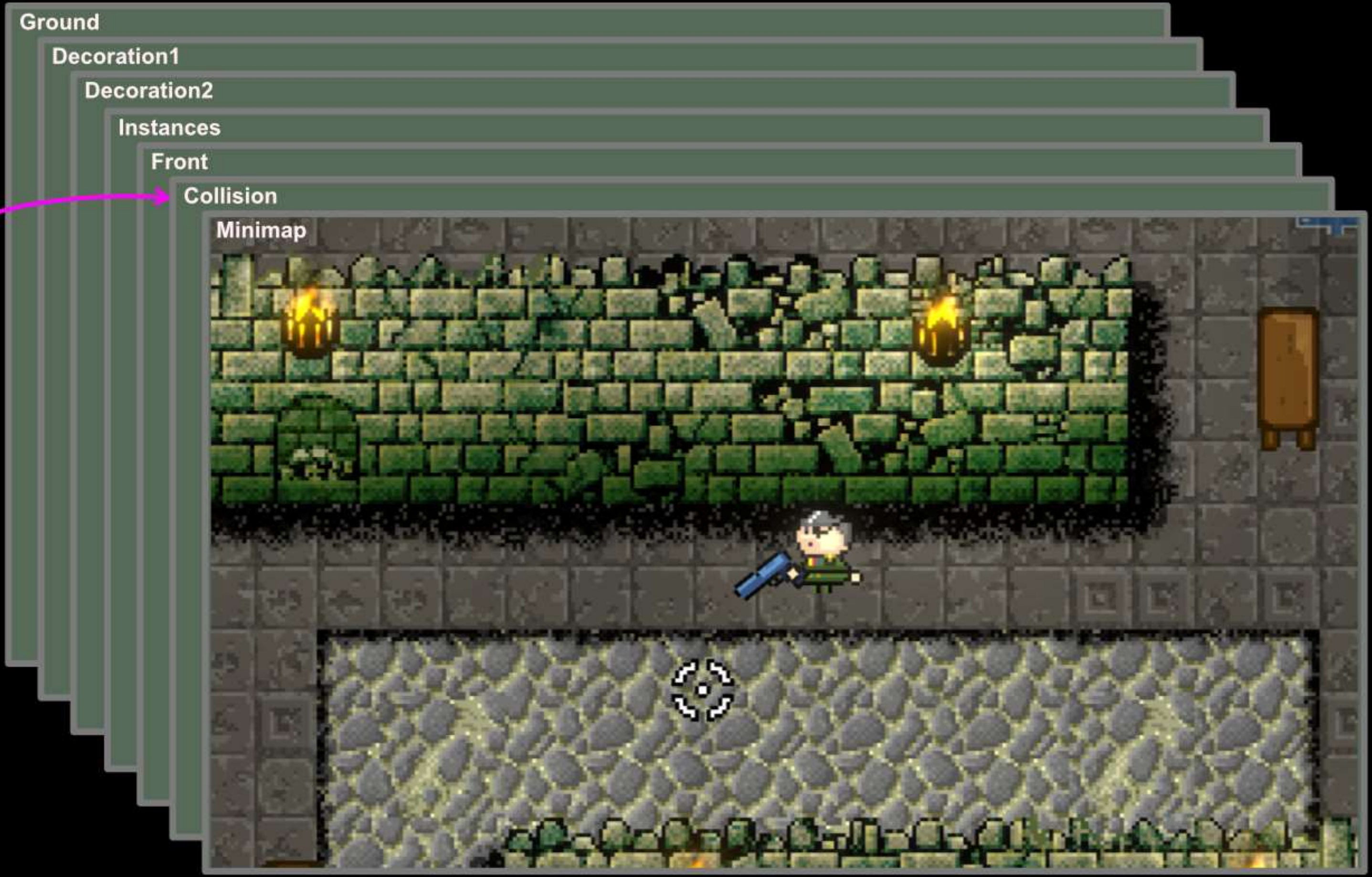
The top part of the wall is drawn on the tilemap with the Front sorting layer specified

The bottom part of the wall is drawn on the tilemap with the Ground sorting layer specified

The Player character is drawn on the Instances sorting layer - so appears in front of the bottom of the wall that's drawn on the Ground sorting layer

The ground shadows are drawn on the tilemap with the Decoration1 sorting layer specified

Sorting And Tilemap Layers

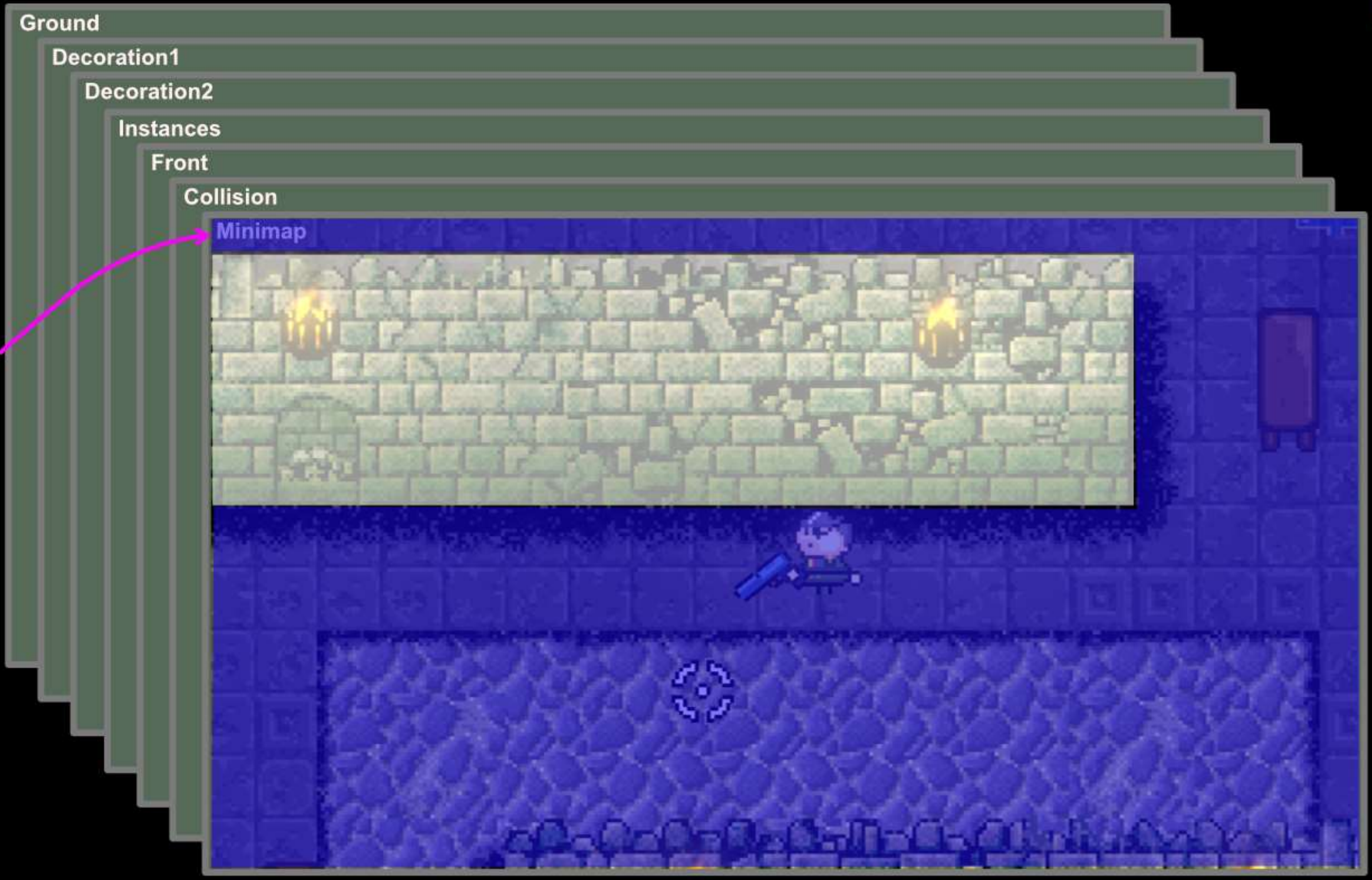


The Collision tilemap isn't rendered at all in the game (the tilemap renderer is disabled). It's only used to hold details of areas that the player should collide with and not be able to walk through. This tilemap is on the Collision sorting layer which appears on top of the other layers so that the collision tiles can be easily drawn on top of the other tilemaps using a semi-transparent coloured tile that enables the tilemaps underneath to still be viewed.

Sorting And Tilemap Layers

The Minimap tilemap is on the MiniMap Layer and on the Minimap sorting layer. The main game camera doesn't render the Minimap layer (not listed in the main camera culling mask). The minimap is rendered by the MiniMap Camera.

The Minimap is on the Minimap sorting layer, like the collision layer it's on a top sorting layer to allow the minimap to be easily drawn over the other tilemaps using the blue and white minimap tiles.



The minimap is rendered by the MiniMap Camera.