PillarEditor User's Guide

Version: 1.0

Last Updated: January 6, 2026

A comprehensive guide to using the PillarEditor for 2D game development with the Pillar Engine.

Table of Contents

Introduction

PillarEditor is a professional 2D game editor built on top of the Pillar Engine. It provides a visual interface for creating and editing game scenes, managing entities, configuring components, and testing your game in real-time.

Key Features

- **Visual Scene Editor** - Drag-and-drop entity creation and manipulation
- **Component-Based Architecture** - Add/remove components with live editing
- **Play Mode Testing** - Test your game instantly without leaving the editor
- **Transform Gizmos** - Visual translate, rotate, and scale tools
- **Undo/Redo** - Full command history for all edits
- **Entity Templates** - Reusable entity presets for rapid prototyping
- **Animation Editor** - Frame-by-frame sprite animation tools
- **Sprite Sheet Support** - Import and slice sprite sheets visually
- **Asset Browser** - Organized view of all project assets
- **Console Logging** - Real-time debug output with filtering

Getting Started

Launching the Editor

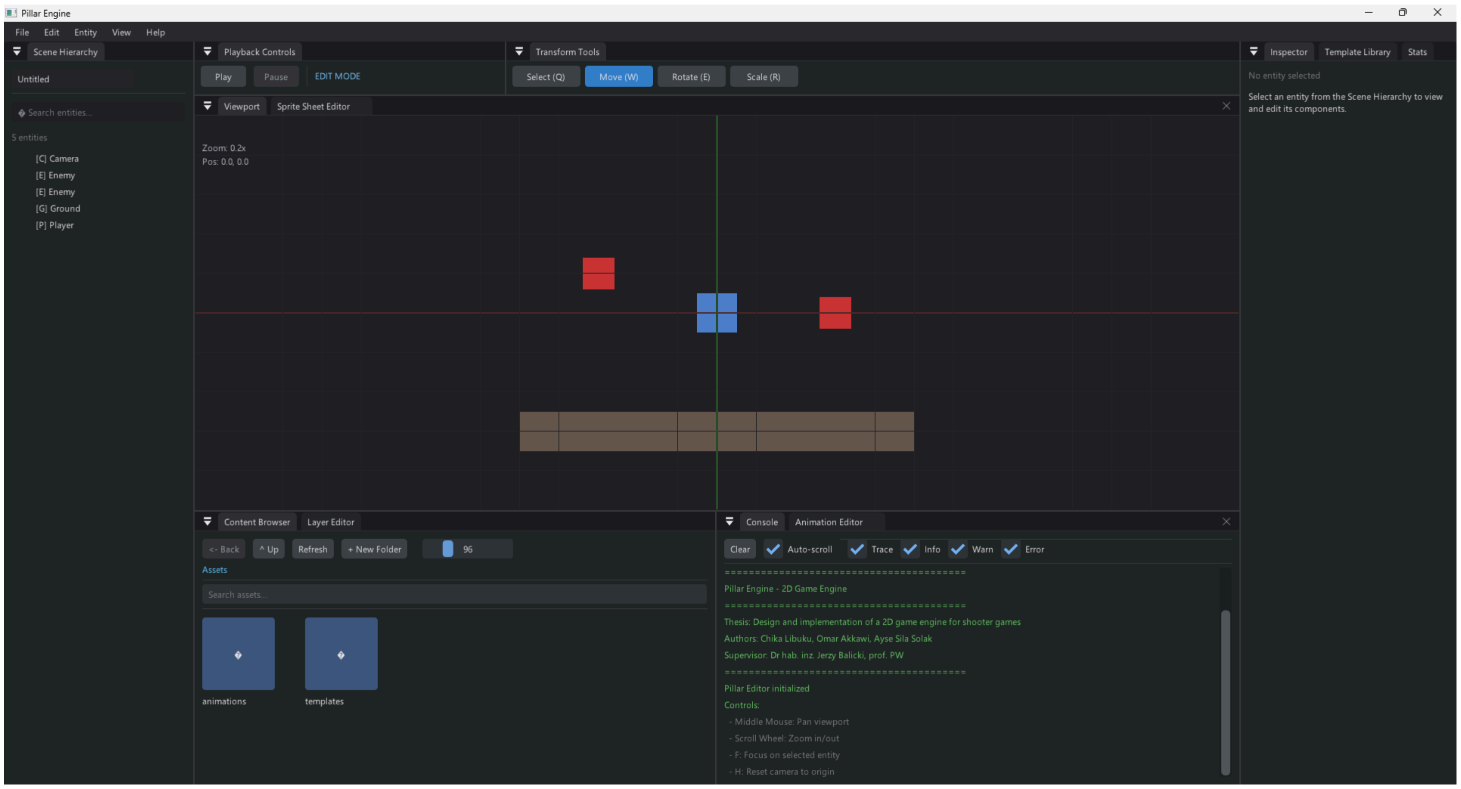
Run `PillarEditor.exe` from your build directory:

```
bin/Debug-x64/PillarEditor/PillarEditor.exe
```

First Launch

When you first launch PillarEditor, you'll see:

- A default empty scene with a camera entity
- Multiple dockable panels arranged in the default layout
- The viewport displaying the scene view



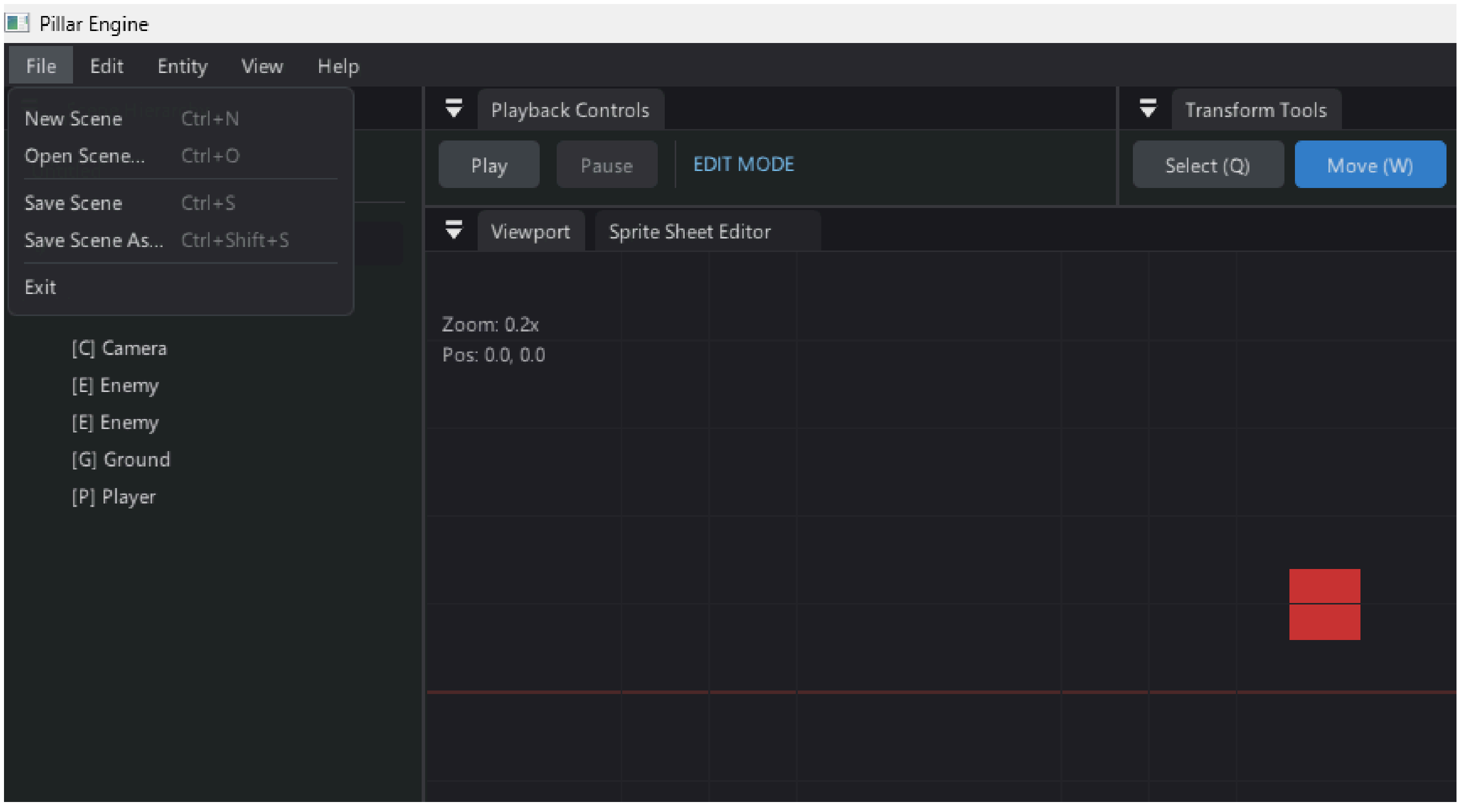
No entity selected

Select an entity from the Scene Hierarchy to view and edit its components.

```
========================================
Pillar Engine - 2D Game Engine
========================================
Thesis: Design and implementation of a 2D game engine for shooter games
Authors: Chika Libuku, Omar Akkawi, Ayse Sila Solak
Supervisor: Dr hab. inz. Jerzy Balicki, prof. PW
========================================
Pillar Editor initialized
Controls:
  - Middle Mouse: Pan viewport
  - Scroll Wheel: Zoom in/out
  - F: Focus on selected entity
  - H: Reset camera to origin
```

Creating Your First Scene

1. **Create a New Scene**: File → New Scene (Ctrl+N) or start with the default scene
2. **Save the Scene**: File → Save Scene As (Ctrl+Shift+S) and choose a location in `assets/scenes/`
3. **Create an Entity**: Right-click in the Scene Hierarchy and select "Create Entity"
4. **Add Components**: Select the entity and use "Add Component" in the Inspector



Interface Overview

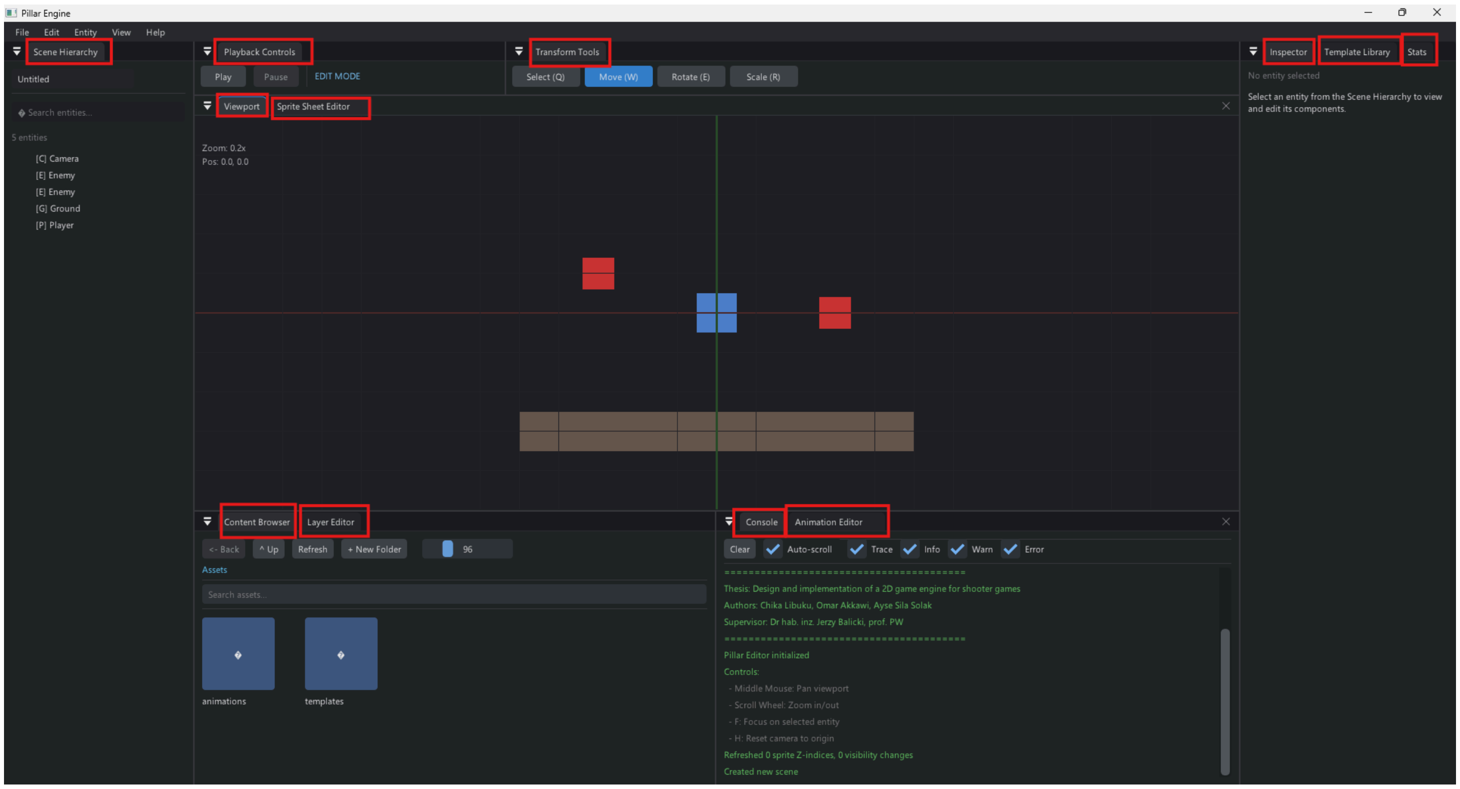
PillarEditor uses a dockable panel system powered by ImGui Docking. You can rearrange, resize, and tab panels to customize your workspace.

Default Layout

The editor opens with the following panels:

Panel	Location	Size	Purpose
Viewport	Center	~54%	Scene rendering and entity manipulation (LARGEST)
Scene Hierarchy	Left	~18%	Entity tree structure
Inspector	Right	~28%	Component editing for selected entities
Content Browser	Bottom-Left	~30% height	Asset browsing and management
Console	Bottom-Right	~30% height	Log output with filtering
Animation Manager	Tab (Bottom-Right)	Optional	Animation clip management
Template Library	Tab (Right)	Optional	Entity template browser

The viewport is intentionally the largest panel, centralized for optimal scene editing. All panels are properly docked on first launch.



No entity selected

Select an entity from the Scene Hierarchy to view and edit its components.

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Pillar Editor initialized
Controls:
  - Middle Mouse: Pan viewport
  - Scroll Wheel: Zoom in/out
  - F: Focus on selected entity
  - H: Reset camera to origin
Refreshed 0 sprite Z-indices, 0 visibility changes
Created new scene
```

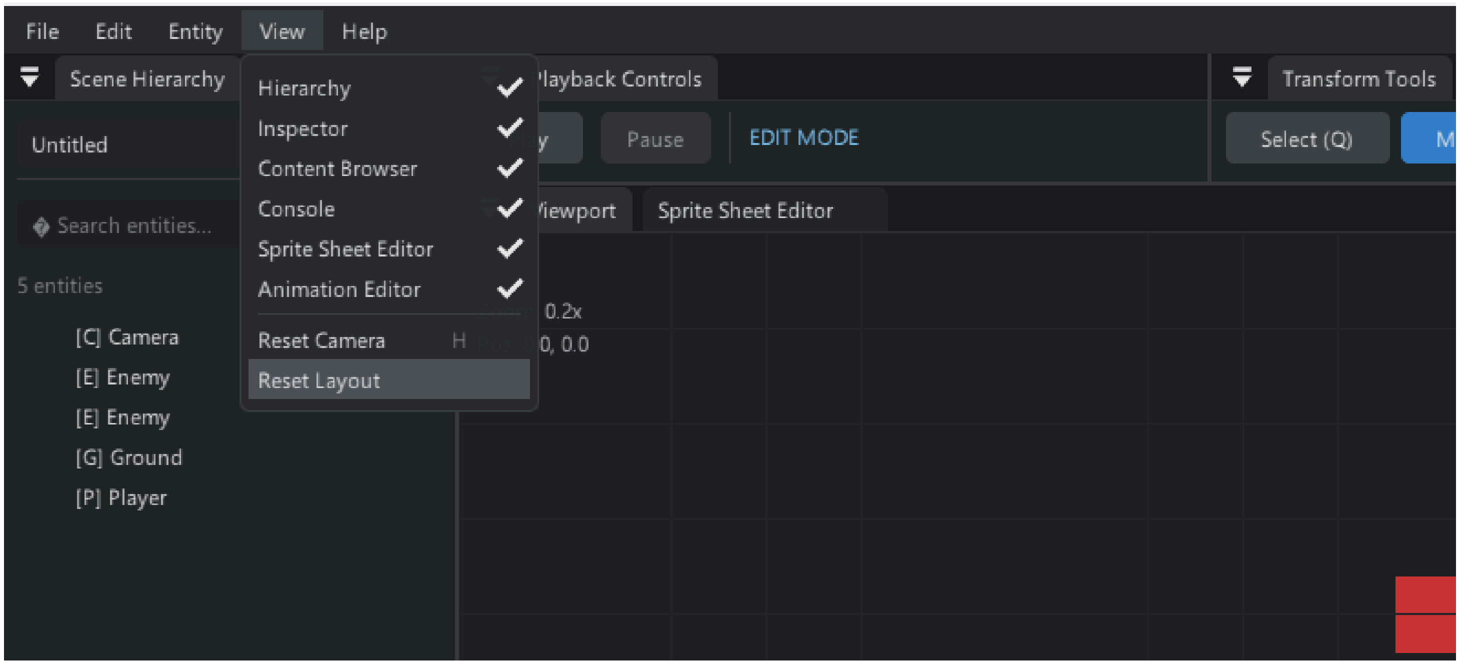
Customizing the Layout

1. **Resize Panels** - Drag panel borders to resize
2. **Move Panels** - Drag panel title bar to undock and redock
3. **Create Tabs** - Drag panel onto another to create tabs
4. **Float Panels** - Drag panel outside dockspace to float

Resetting the Layout

If you've rearranged panels and want to restore the default:

1. Go to **View** → **Reset Layout**
2. The layout will reset on the next frame
3. All panels return to their default positions and sizes



Menu Bar

File Menu

- **New Scene** (Ctrl+N) - Create a blank scene
- **Open Scene** (Ctrl+O) - Load an existing scene
- **Save Scene** (Ctrl+S) - Save current scene
- **Save Scene As** (Ctrl+Shift+S) - Save scene with new name
- **Recent Files** - Quick access to recently opened scenes
- **Exit** - Close the editor

Edit Menu

- **Undo** (Ctrl+Z) - Undo last action
- **Redo** (Ctrl+Y) - Redo previously undone action
- **Duplicate** (Ctrl+D) - Duplicate selected entities

View Menu

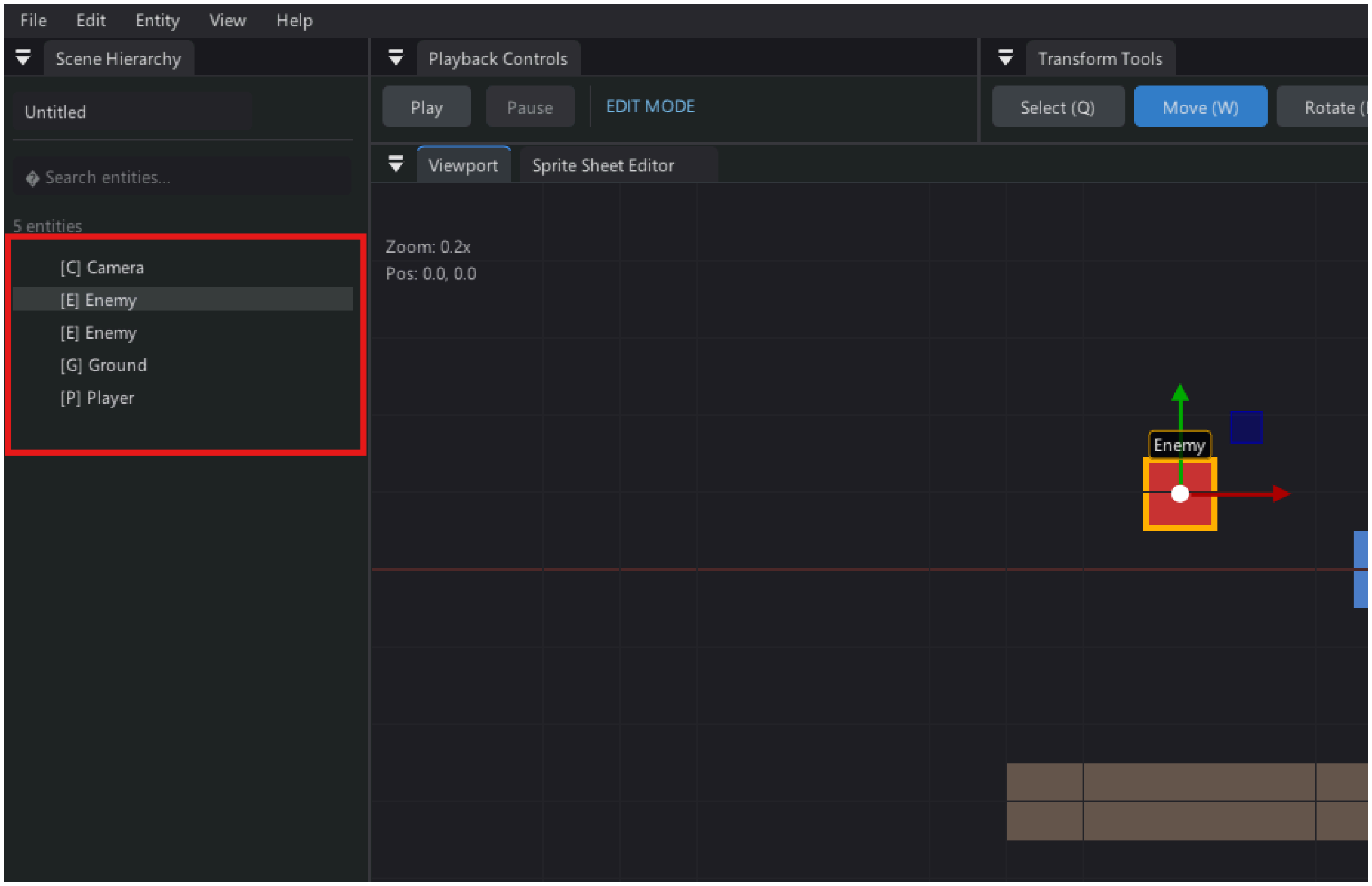
- Toggle visibility of each panel
- Reset Layout - Restore default panel arrangement

Entity Menu

- **Create Entity** - Create a new empty entity
- **Create Template** - Create entity from template library

Scene Hierarchy Panel

The Scene Hierarchy displays all entities in your scene as a tree structure. It supports parent-child relationships and multi-selection.



Creating Entities

Right-click in empty space:

- **Create Entity** - Create a new entity with default components (Tag, Transform, UUID, Hierarchy)
- **Create Template** - Browse and instantiate entity templates

Keyboard:

- **Ctrl+Shift+N** - Create new entity

Selecting Entities

- **Left-Click** - Select a single entity

- **Ctrl+Click** - Add/remove entity from selection
- **Click Empty Space** - Deselect all

Selected entities are highlighted in orange.

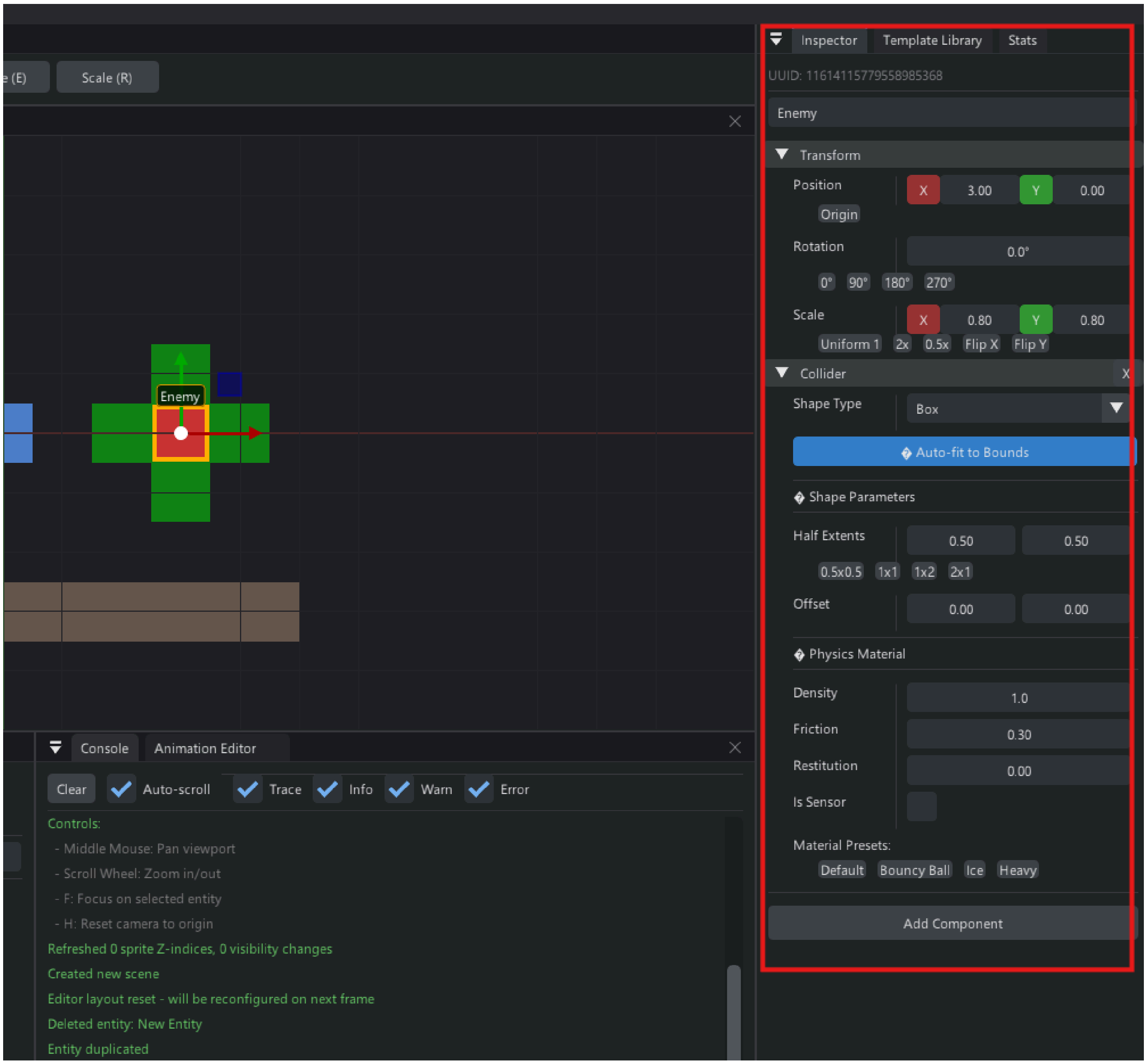
Entity Operations

Right-click on an entity:

- **Duplicate** (Ctrl+D) - Create a copy
- **Delete** (Delete key) - Remove entity

Inspector Panel

The Inspector displays and allows editing of all components attached to the selected entity. Each component type has a specialized editor interface.



```
Controls:
 - Middle Mouse: Pan viewport
 - Scroll Wheel: Zoom in/out
 - F: Focus on selected entity
 - H: Reset camera to origin
Refreshed 0 sprite Z-indices, 0 visibility changes
Created new scene
Editor layout reset - will be reconfigured on next frame
Deleted entity: New Entity
Entity duplicated
```

UUID: 11614115779558985368

Enemy

Transform

Position X 3.00 Y 0.00

Rotation 0.0°

Scale X 0.80 Y 0.80

Collider

Shape Type Box

Shape Parameters

Half Extents 0.50 0.50

Offset 0.00 0.00

Physics Material

Density 1.0

Friction 0.30

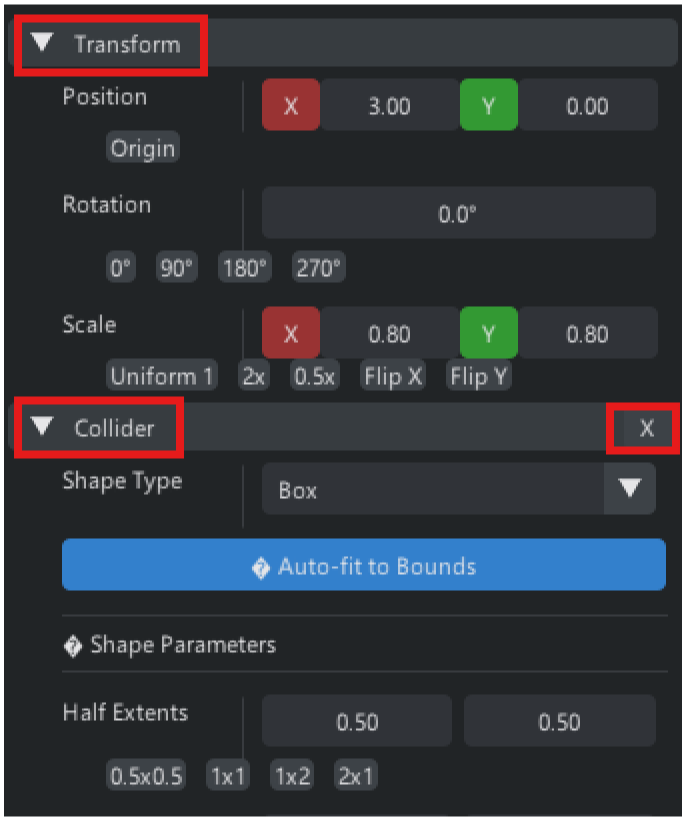
Restitution 0.00

Is Sensor

Component Headers

Each component has a collapsible header showing:

- Component type name
- Collapse/expand arrow
- **Remove button (X)** - Delete the component (not available for Transform/Tag)


Transform
Position X 3.00 Y 0.00
Rotation 0.0°
Scale X 0.80 Y 0.80
Collider
Shape Type Box
Shape Parameters
Half Extents 0.50 0.50

Transform Component

Non-removable. Defines the entity's position, rotation, and scale.

- **Position** (X, Y) - World space coordinates
- **Rotation** (degrees) - Rotation angle in degrees
- **Scale** (X, Y) - Size multiplier

Features:

- Drag values to adjust incrementally
- Click and type for precise values
- Right-click for reset options
- Linked to viewport gizmos

Sprite Component

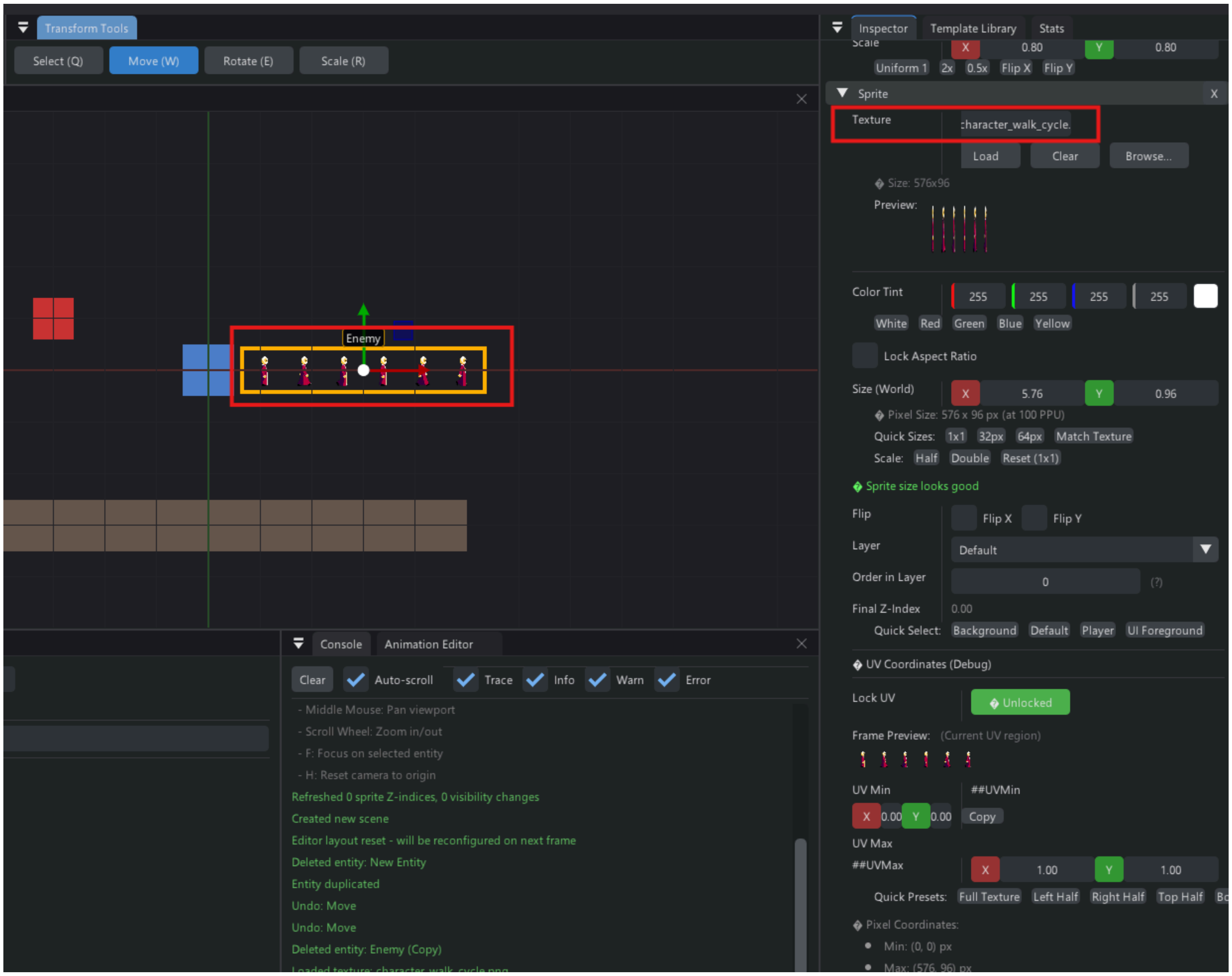
Renders a textured or colored quad.

- **Texture** - Drag & drop from Content Browser
- **Color** - RGBA color picker with tint control
- **Size** (Width, Height) - Sprite dimensions in world units
- **Use Texture Size** - Button to match sprite size to texture dimensions

- **Sorting Layer** - Render order layer name
- **Order in Layer** - Render priority within layer

Presets:

- **White Square** - Default white sprite
- **Colored Sprite** - Common solid colors (Red, Green, Blue, Yellow)



```
Scale           X 0.80   Y 0.80
▼ Sprite
Texture         character_walk_cycle.
◆ Size: 576x96
Preview:
Color Tint      255  255  255  255
Lock Aspect Ratio
Size (World)    X 5.76   Y 0.96
◆ Pixel Size: 576 x 96 px (at 100 PPU)
Quick Sizes: 1x1  32px  64px  Match Texture
Scale: Half  Double  Reset (1x1)
◆ Sprite size looks good
Flip            Flip X   Flip Y
Layer           Default
Order in Layer  0   (?)
Final Z-Index   0.00
Quick Select: Background  Default  Player  UI Foreground
◆ UV Coordinates (Debug)
Lock UV         ◆ Unlocked
Frame Preview:  (Current UV region)
UV Min          ##UVMin
X 0.00  Y 0.00
UV Max
##UVMax         X 1.00   Y 1.00
Quick Presets: Full Texture  Left Half  Right Half  Top Half  Bo
◆ Pixel Coordinates:
  • Min: (0, 0) px
  • Max: (576, 96) px
```

```
- Middle Mouse: Pan viewport
- Scroll Wheel: Zoom in/out
- F: Focus on selected entity
- H: Reset camera to origin
Refreshed 0 sprite Z-indices, 0 visibility changes
Created new scene
Editor layout reset - will be reconfigured on next frame
Deleted entity: New Entity
Entity duplicated
Undo: Move
Undo: Move
Deleted entity: Enemy (Copy)
Loaded texture: character_walk_cycle.png
```

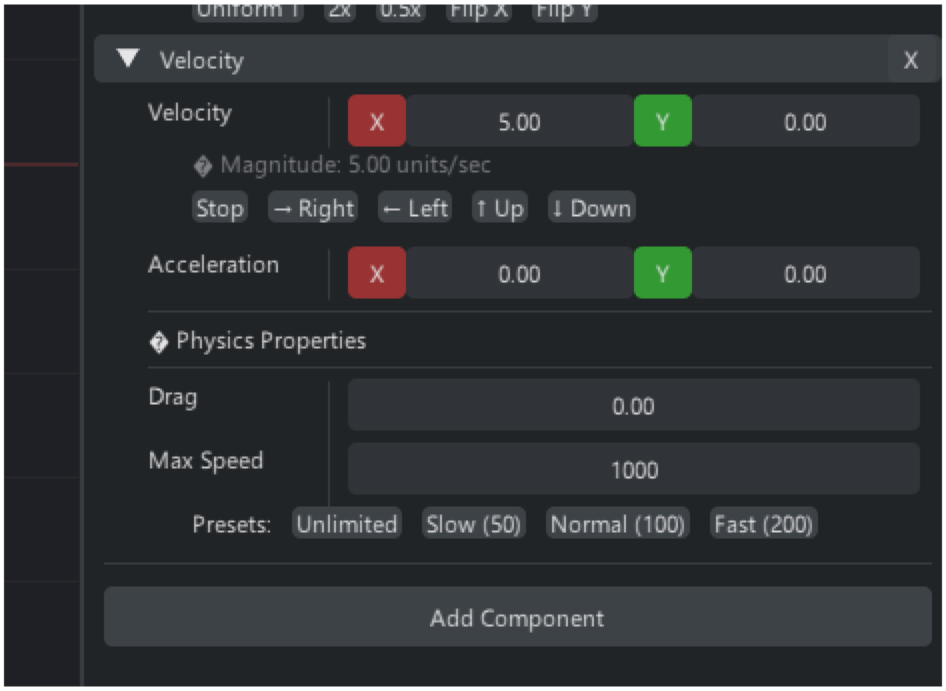
Velocity Component

Adds constant velocity to entity position each frame.

- **Velocity** (X, Y) - Movement speed in units per second
- **Enable Rotation** - Align sprite with velocity direction

Presets:

- **Stationary** (0, 0)
- **Move Right** (5, 0)
- **Move Up** (0, 5)
- **Diagonal** (3.5, 3.5)



Velocity

Velocity X 5.00 Y 0.00

Magnitude: 5.00 units/sec

Acceleration X 0.00 Y 0.00

Physics Properties

Drag 0.00

Max Speed 1000

Rigidbody Component

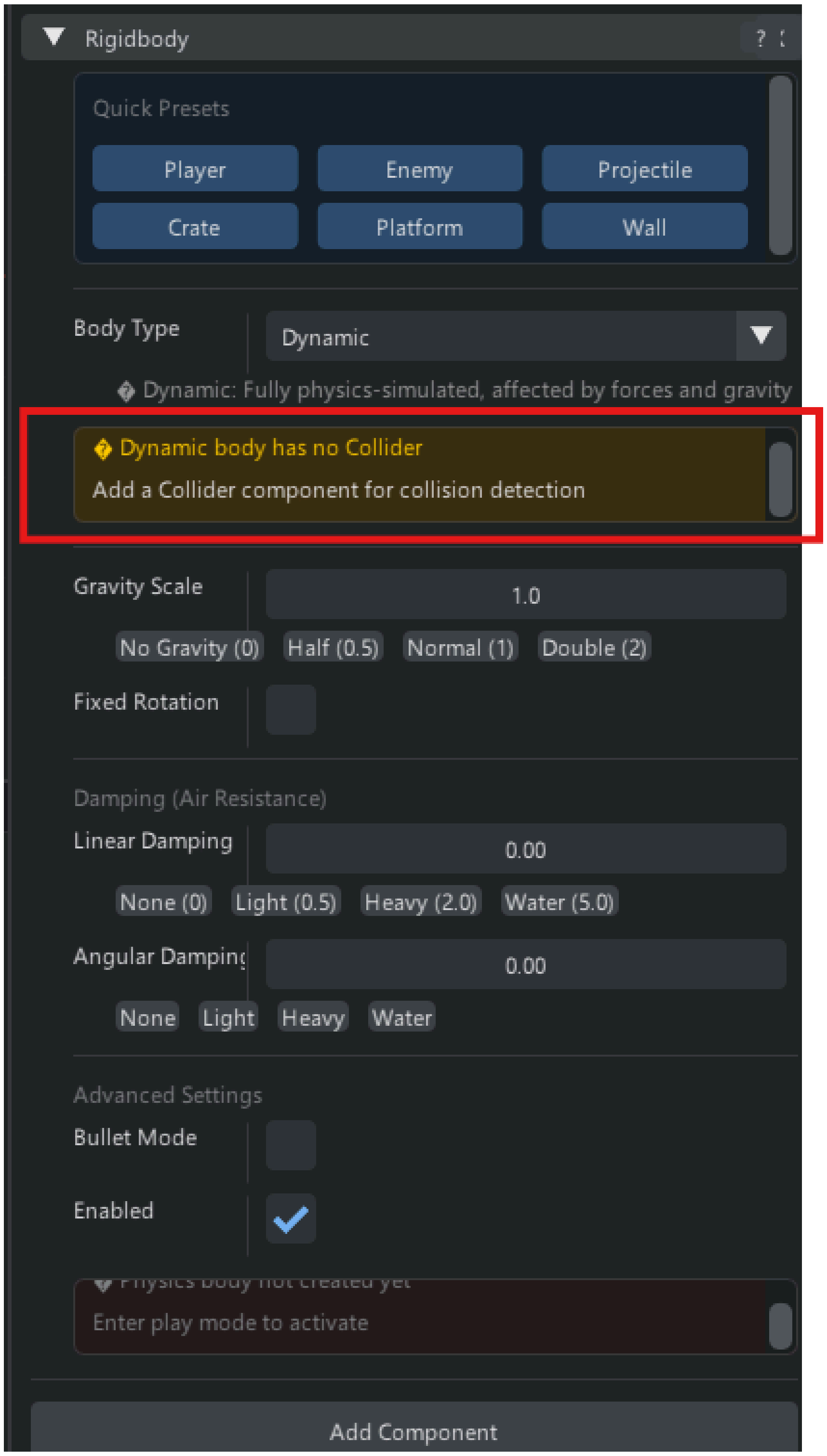
Makes entity participate in physics simulation (Box2D integration).

- **Body Type**
  - **Static** - Immovable, infinite mass (walls, floors)
  - **Dynamic** - Full physics simulation (player, enemies)
  - **Kinematic** - Velocity-controlled, no physics forces (platforms)
- **Fixed Rotation** - Prevent physics rotation
- **Gravity Scale** - Multiply global gravity (0 = no gravity, 1 = normal)
- **Linear Damping** - Slow down over time (air resistance)
- **Angular Damping** - Slow rotation over time

Presets:

- **Static Wall**
- **Dynamic Object** (player/enemy)
- **Kinematic Platform**
- **Zero Gravity**

Warning: Requires a Collider component to work!


Rigidbody

Quick Presets

Body Type: Dynamic

◆ Dynamic: Fully physics-simulated, affected by forces and gravity

◆ Dynamic body has no Collider
Add a Collider component for collision detection

Gravity Scale: 1.0

Fixed Rotation: ☐

Damping (Air Resistance)

Linear Damping: 0.00

Angular Damping: 0.00

Advanced Settings

Bullet Mode: ☐

Enabled: ✓

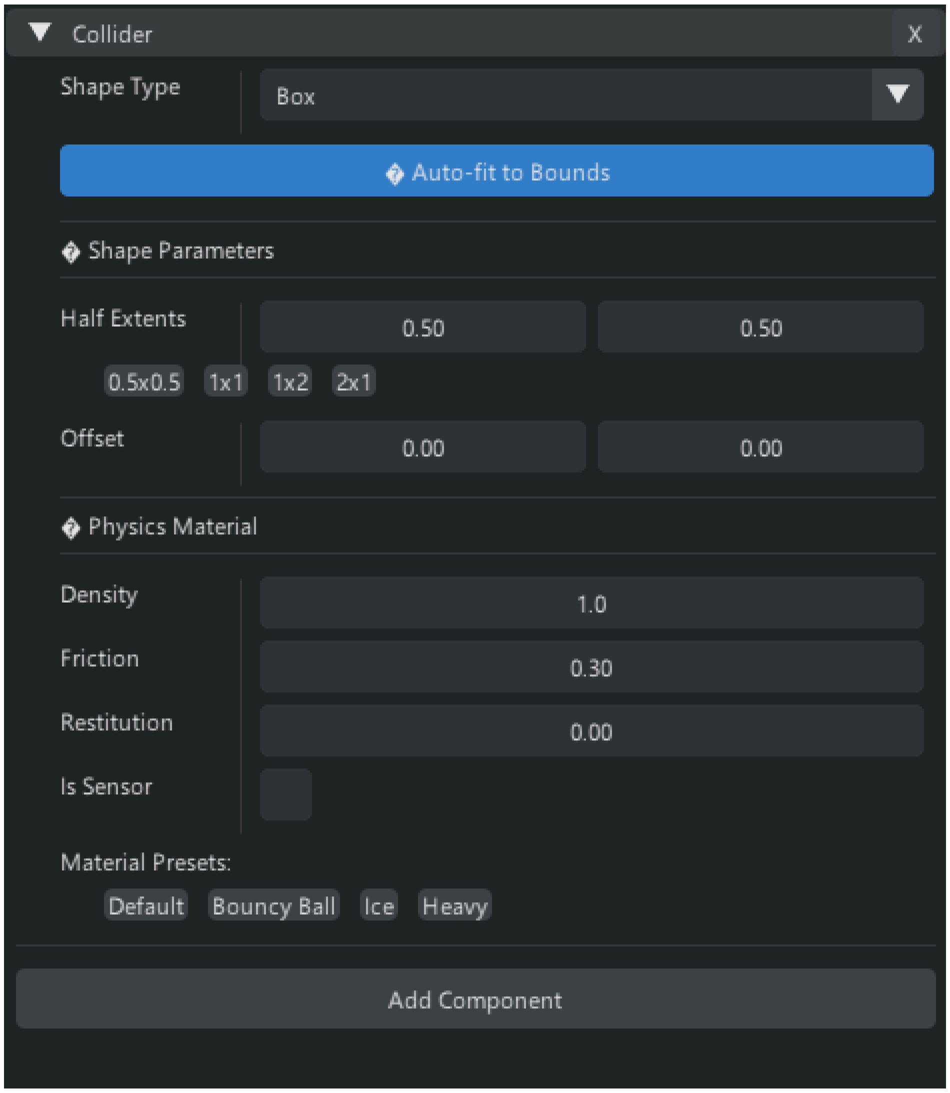
◆ Physics body not created yet
Enter play mode to activate

Collider Component

Physics collision shape.

- **Type** - Circle, Box or polygon
- **Size** (Width, Height) - Collider dimensions
- **Offset** (X, Y) - Position offset from transform
- **Is Sensor** - Detect collisions without physical response (triggers)

- **Density** - Mass per unit area
- **Friction** - Surface friction (0 = ice, 1 = rubber)
- **Restitution** - Bounciness (0 = no bounce, 1 = perfect bounce)



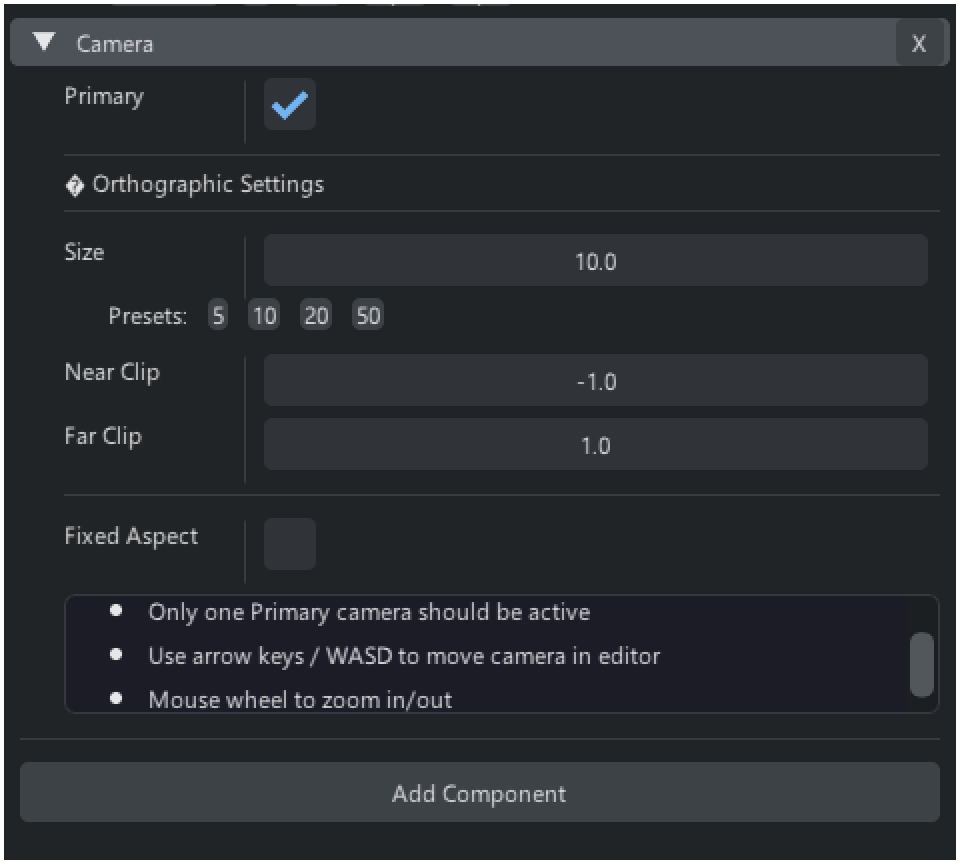
Shape Type	Box	
Half Extents	0.50	0.50
Offset	0.00	0.00
Density	1.0	
Friction	0.30	
Restitution	0.00	
Is Sensor		

Camera Component

Makes entity act as a rendering camera.

- **Orthographic Size** - Half-height of visible area in world units
- **Primary** - Mark as the active rendering camera
- **Fixed Aspect Ratio** - Maintain aspect ratio on window resize

Note: Scenes must have exactly one primary camera.



Camera

Primary ✓

� Orthographic Settings

Size 10.0

Presets: 5 10 20 50

Near Clip -1.0

Far Clip 1.0

Fixed Aspect

- Only one Primary camera should be active
- Use arrow keys / WASD to move camera in editor
- Mouse wheel to zoom in/out

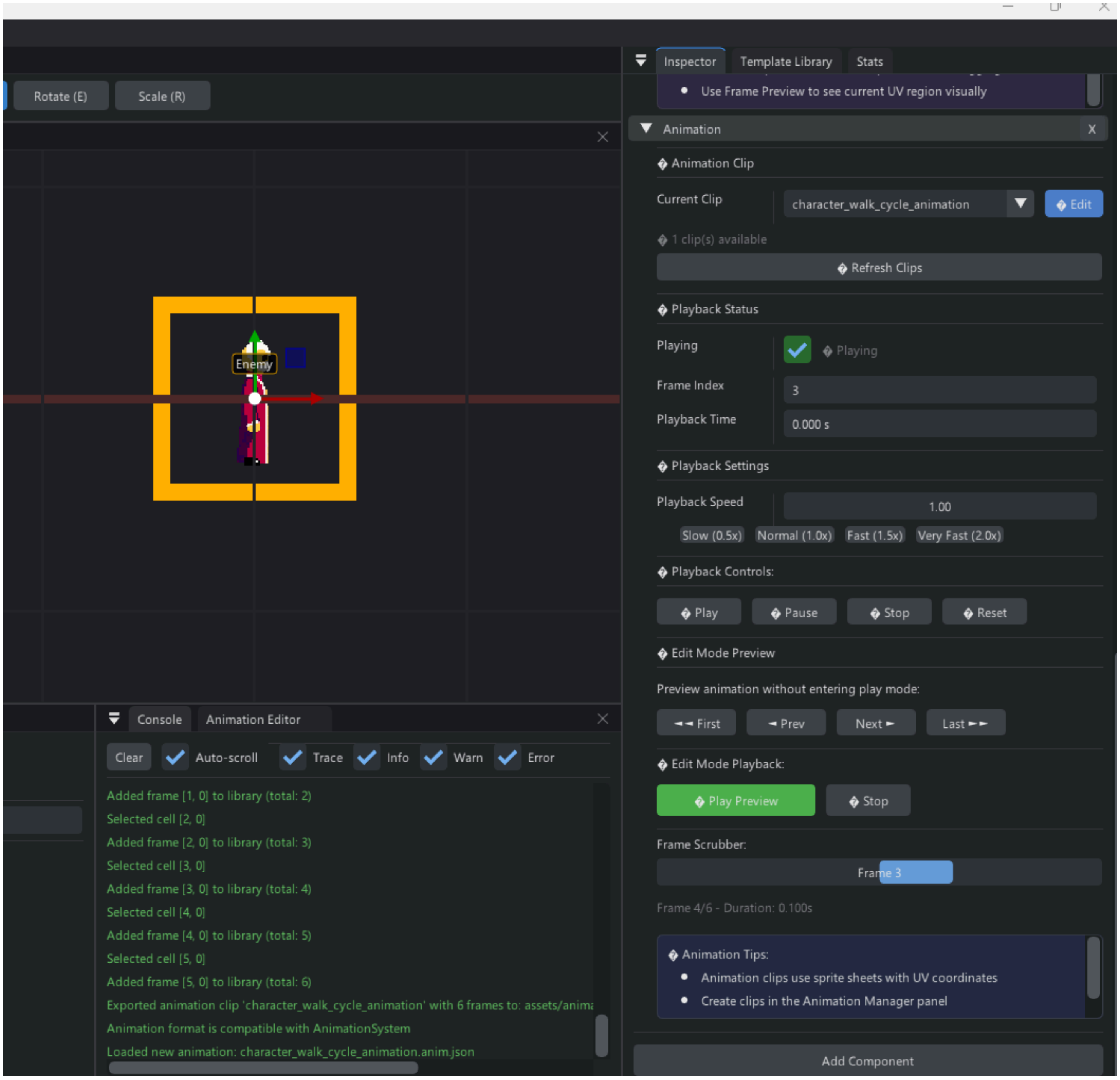
Animation Component

Plays sprite animations using animation clips.

- **Animation Clip** - Select animation asset from dropdown
- **Current Animation** - Display name of active animation
- **Playing** - Playback state indicator
- **Playback Speed** - Speed multiplier (1.0 = normal speed)

Controls:

- **Play** - Start animation playback
- **Pause** - Pause animation
- **Stop** - Stop and reset to first frame



```
Added frame [1, 0] to library (total: 2)
Selected cell [2, 0]
Added frame [2, 0] to library (total: 3)
Selected cell [3, 0]
Added frame [3, 0] to library (total: 4)
Selected cell [4, 0]
Added frame [4, 0] to library (total: 5)
Selected cell [5, 0]
Added frame [5, 0] to library (total: 6)
Exported animation clip 'character_walk_cycle_animation' with 6 frames to: assets/anima
Animation format is compatible with AnimationSystem
Loaded new animation: character_walk_cycle_animation.anim.json
```

- Use Frame Preview to see current UV region visually

Animation Clip

Current Clip: character_walk_cycle_animation

1 clip(s) available

Playback Status

Playing: ✓ Playing

Frame Index: 3

Playback Time: 0.000 s

Playback Settings

Playback Speed: 1.00

Playback Controls:

Edit Mode Preview

Preview animation without entering play mode:

Edit Mode Playback:

Frame Scrubber:

Frame 4/6 - Duration: 0.100s

Animation Tips:

- Animation clips use sprite sheets with UV coordinates
- Create clips in the Animation Manager panel

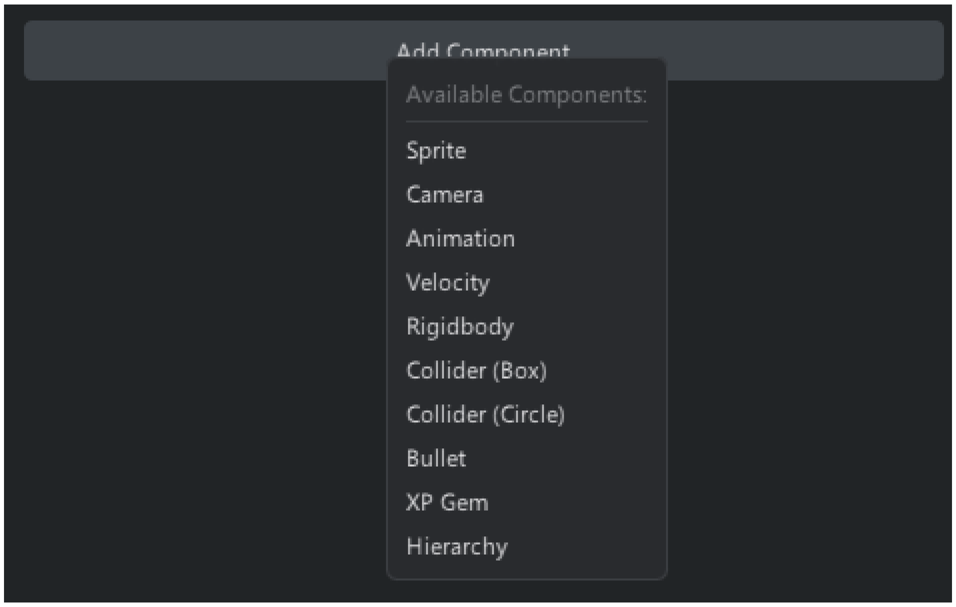
Adding Components

Click **"Add Component"** button at bottom of Inspector to open component menu.

Available Components:

- Velocity
- Rigidbody
- Box Collider
- Circle Collider
- Sprite

- Camera
- Animation
- Bullet
- XP Gem

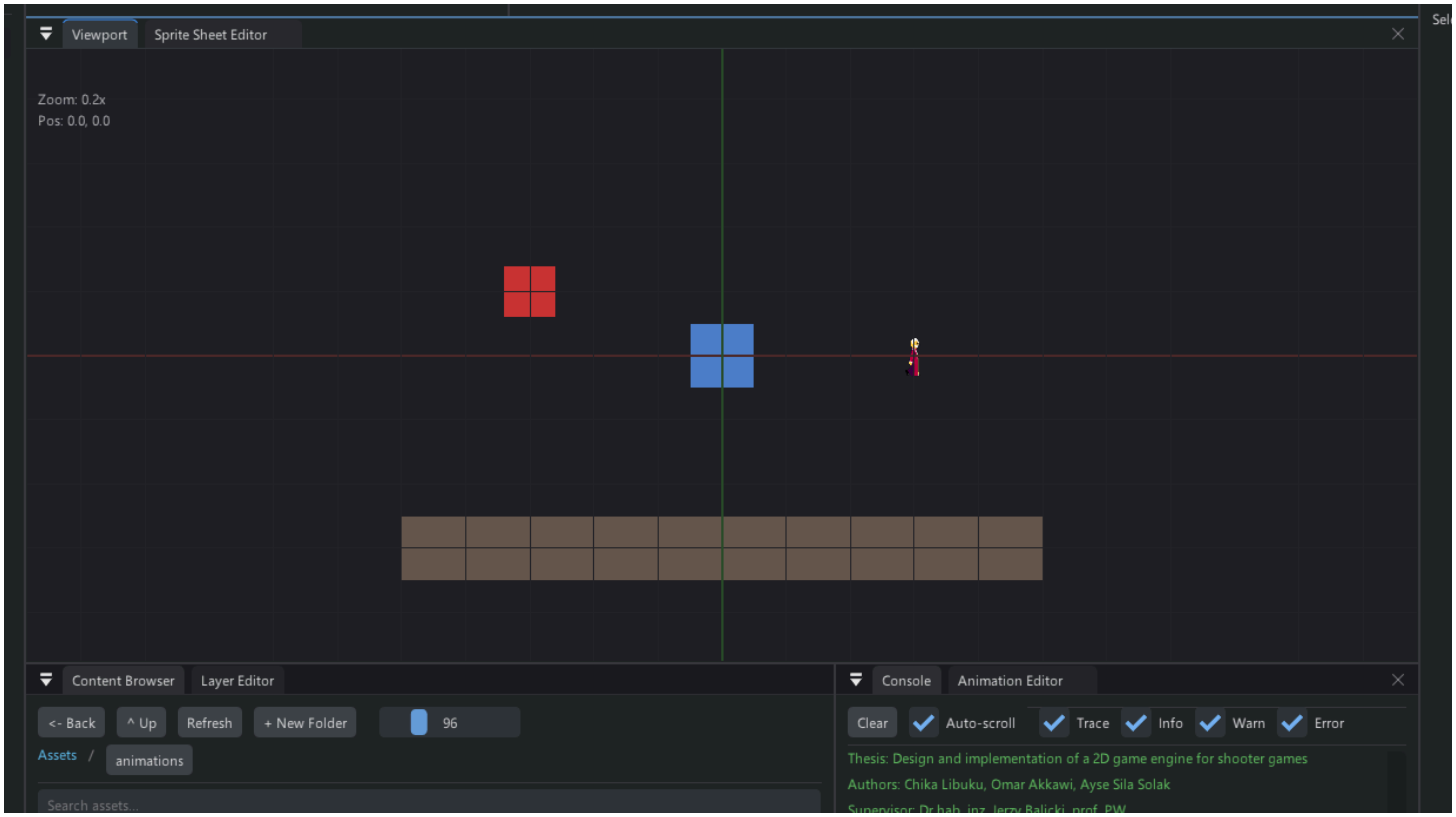


Removing Components

Click the **X button** in the component header. Transform components cannot be removed.

Viewport Panel

The Viewport displays your scene with real-time rendering. It supports camera navigation, entity selection, and transform manipulation.



Thesis: Design and implementation of a 2D game engine for shooter games
Authors: Chika Libuku, Omar Akkawi, Ayse Sila Solak
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Viewport Controls

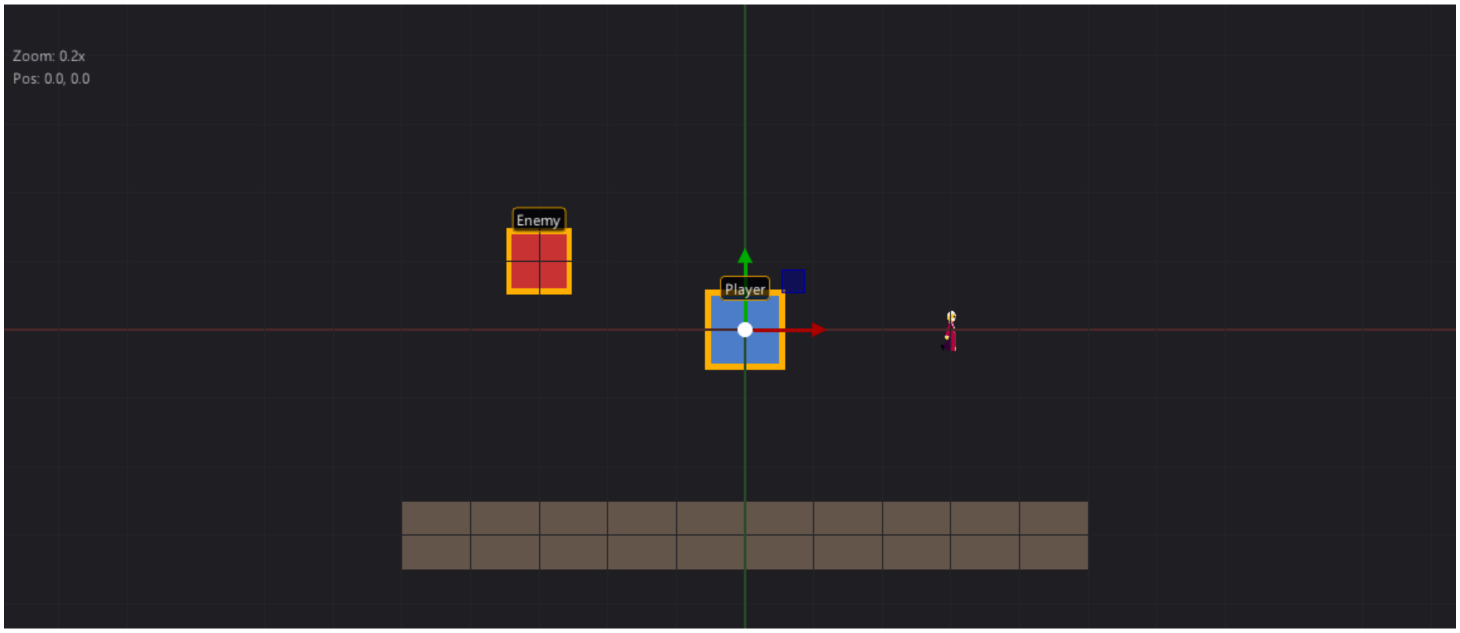
Camera Navigation

- **Middle Mouse Button (Hold)** - Pan camera
- **Mouse Wheel** - Zoom in/out
- **F Key** - Focus on selected entity
- **Alt+Mouse Wheel** - Fine zoom control

Entity Selection

- **Left-Click** on entity - Select entity
- **Ctrl+Left-Click** - Multi-select toggle
- **Click Empty Space** - Deselect all

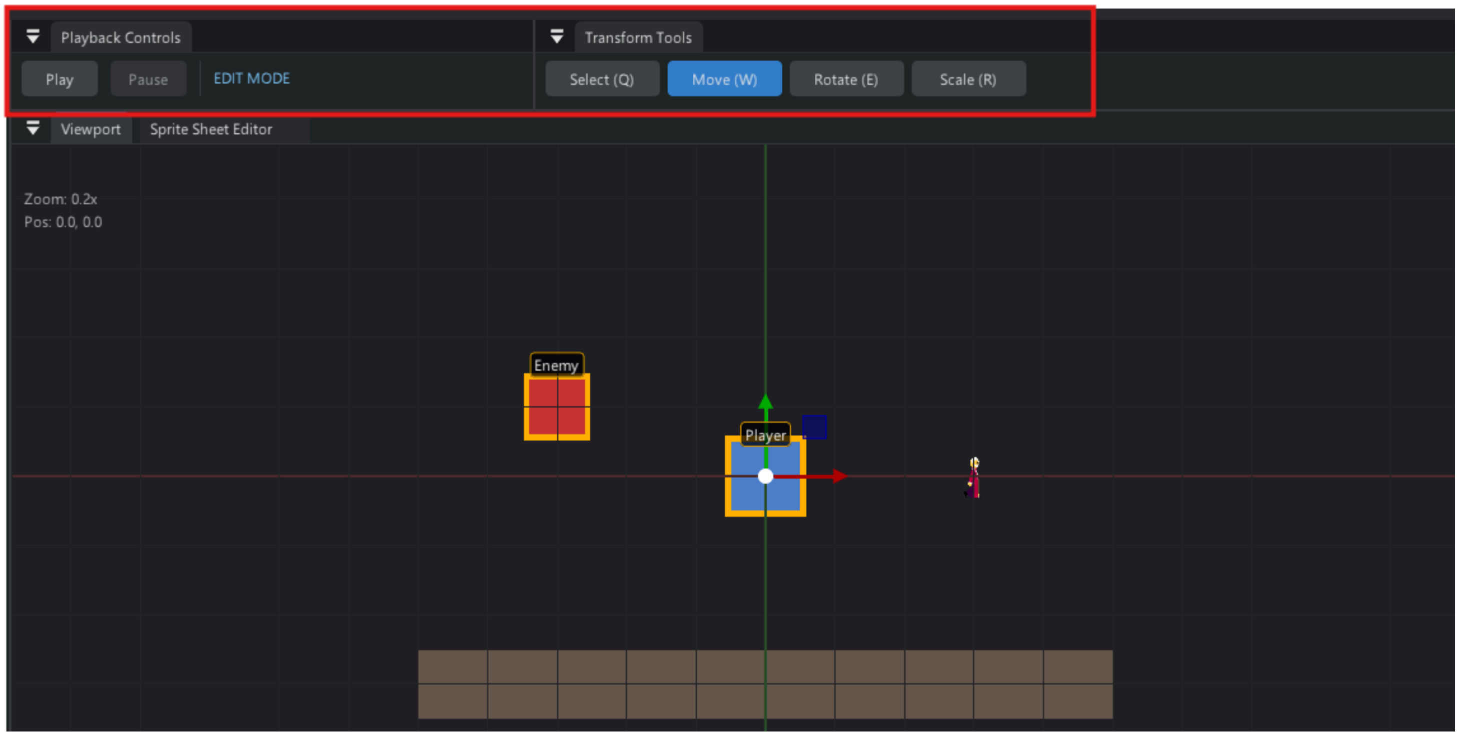
Selected entities are highlighted with a **bright orange outline** (4-line box).



Viewport Toolbar

Located at the top of the viewport:

- **Play Button** ▶ (Ctrl+P) - Enter play mode
- **Pause Button** ⏸ - Pause simulation
- **Stop Button** ■ (Ctrl+Shift+P) - Exit play mode
- **Gizmo Mode Buttons** - Switch between transform tools (W/E/R)



Selection Highlighting

Selected entities are rendered with a bright orange box outline:

- 4 lines: top, bottom, left, right
- Color: (1.0, 0.7, 0.0, 1.0) - Orange
- Renders on top of all entities
- Visible even when entity is behind others

Content Browser Panel

The Content Browser provides a file explorer for your project assets. It displays textures, audio files, scenes, and other resources.

Navigation

- **Double-Click Folder** - Navigate into folder
- **Back Button** - Return to parent directory
- **Root Directory** - Project `assets/` folder

Asset Types

Textures (PNG, JPG, TGA)

- **Thumbnail Preview** - Visual preview of image
- **Drag to Inspector** - Add to Sprite component texture slot
- **Double-Click** - Open in external image editor (if configured)

Audio Files (WAV)

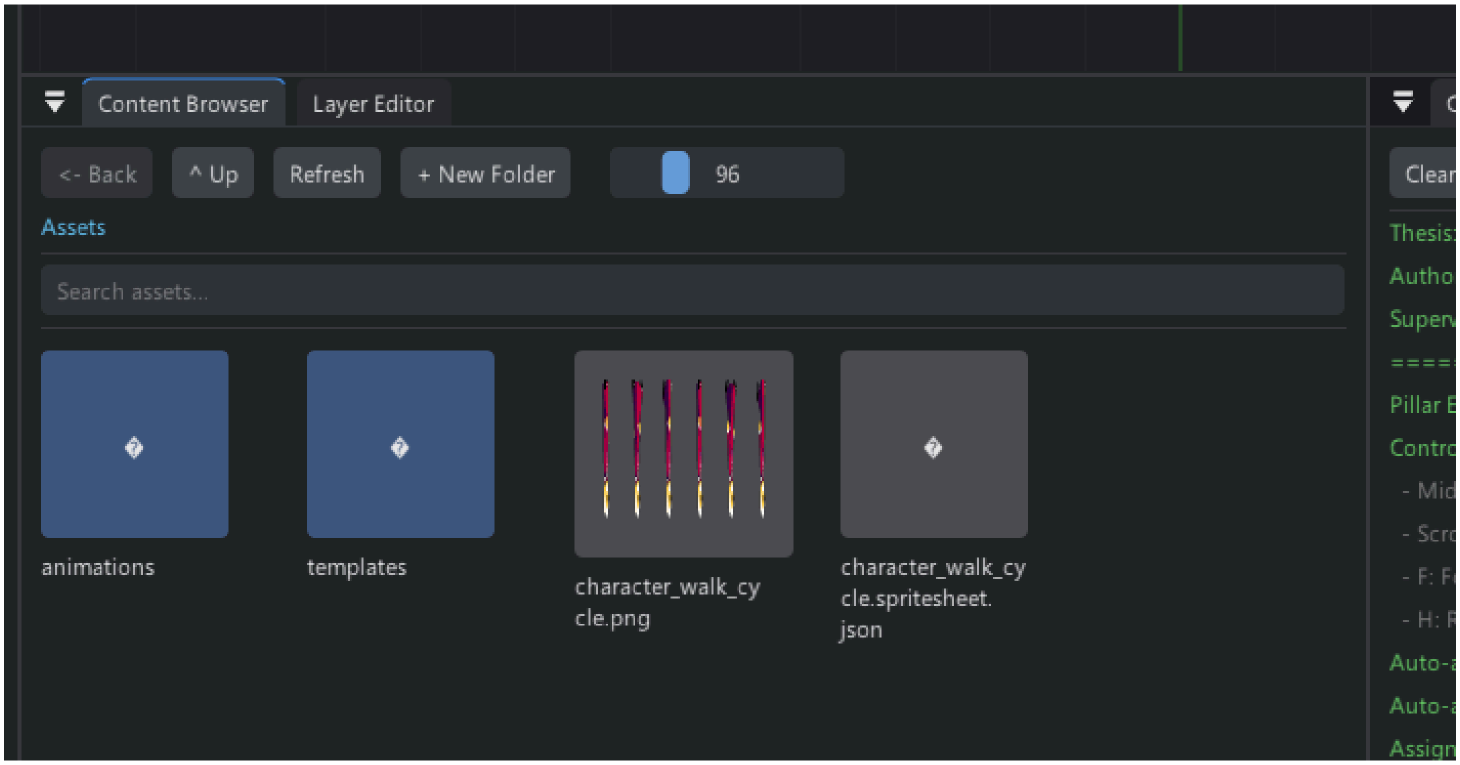
- **Waveform Icon** - Audio file indicator
- **Drag to Inspector** - Add to Audio Source component

Scene Files (.scene.json)

- **Double-Click** - Open scene in editor

Animation Files (.anim.json)

- **Drag to Entity in hierarchy** - Add to Animation component



Asset Operations

Right-Click on Asset:

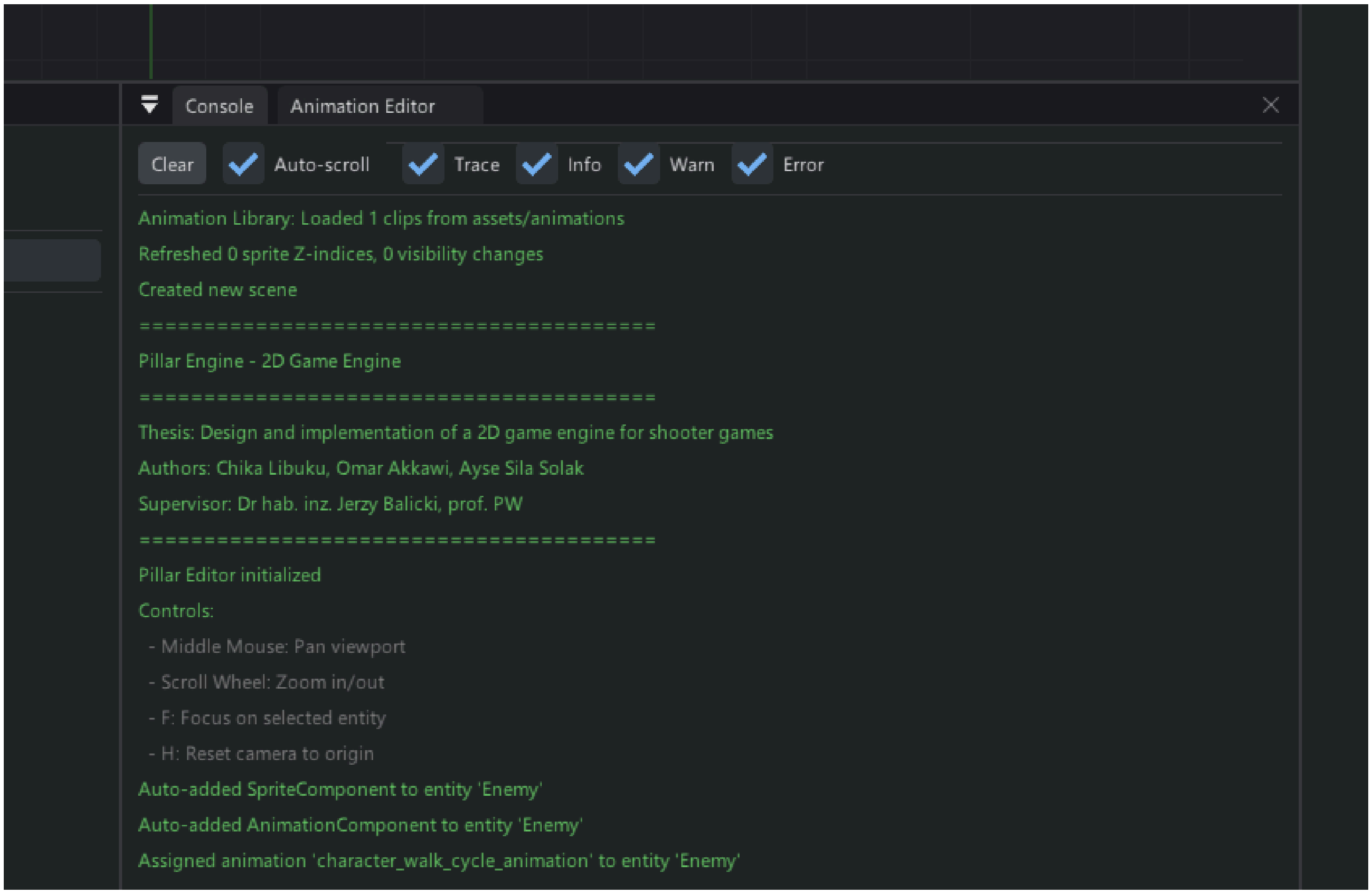
- **Rename** - Change asset filename
- **Delete** - Move to system trash
- **Show in Explorer** - Open file location in Windows Explorer
- **Copy Path** - Copy relative asset path to clipboard

Right-Click in Empty Space:

- **Create Folder** - Create new subdirectory
- **Import** - Open system file dialog to import assets
- **Refresh** - Reload directory contents

Console Panel

The Console displays runtime log messages with filtering and search capabilities.



```
Animation Library: Loaded 1 clips from assets/animations
Refreshed 0 sprite Z-indices, 0 visibility changes
Created new scene
========================================
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========================================
Pillar Editor initialized
Controls:
  - Middle Mouse: Pan viewport
  - Scroll Wheel: Zoom in/out
  - F: Focus on selected entity
  - H: Reset camera to origin
Auto-added SpriteComponent to entity 'Enemy'
Auto-added AnimationComponent to entity 'Enemy'
Assigned animation 'character_walk_cycle_animation' to entity 'Enemy'
```

Log Levels

- **Trace** - Detailed debug information (gray)
- **Info** - General information (white)
- **Warning** - Non-critical issues (yellow)
- **Error** - Critical errors (red)

Console Controls

- **Clear** - Remove all log entries
- **Filter Buttons** - Toggle visibility by log level
  - Trace
  - Info
  - Warning
  - Error
- **Auto-Scroll** - Automatically scroll to newest messages

Using the Console

The console automatically displays:

- Scene loading/saving messages
- Asset loading messages
- Physics warnings
- Script errors
- Custom log messages from your game code

Example Custom Logging:

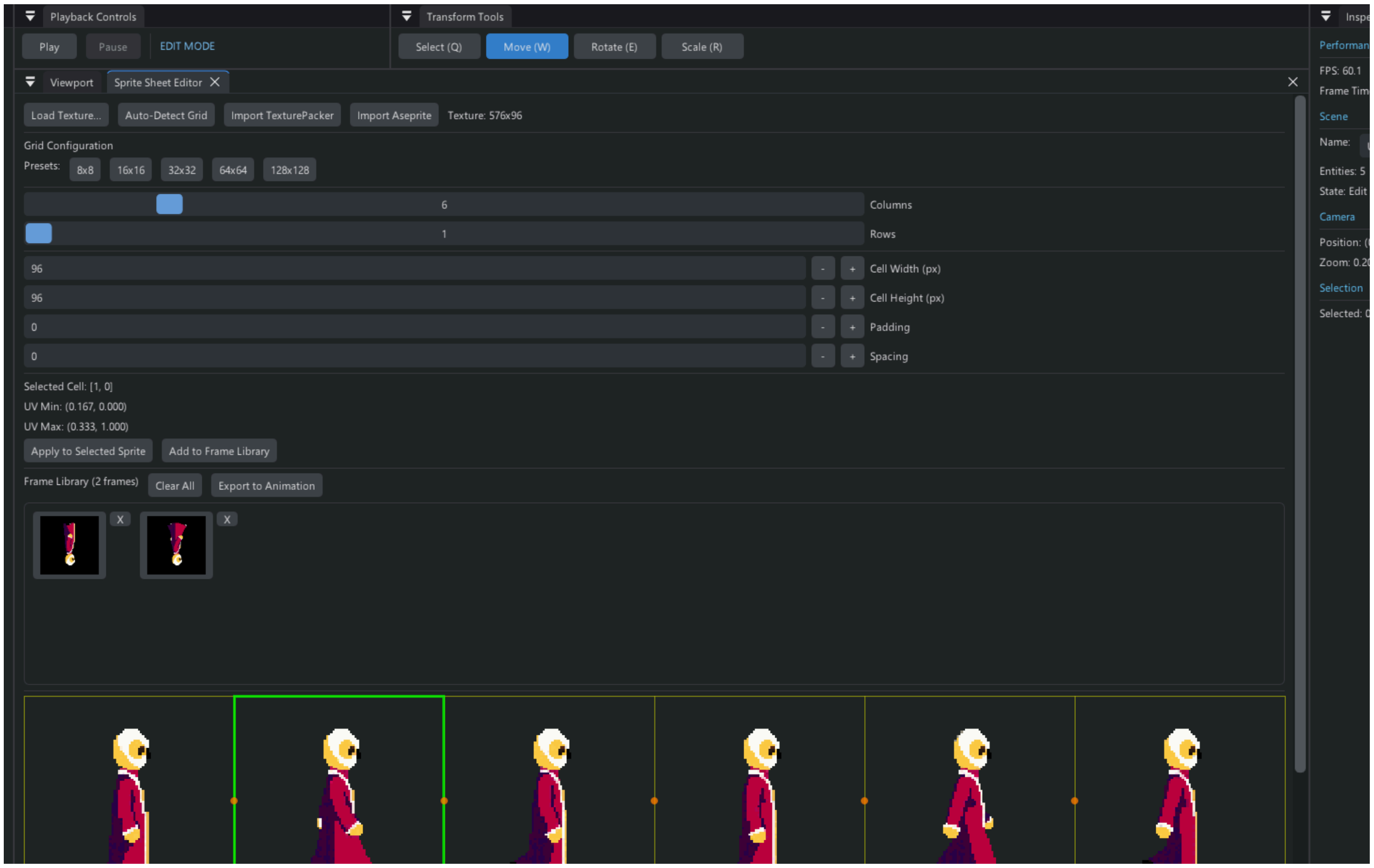
```
ConsolePanel::Log("Controls:", LogLevel::Info);
ConsolePanel::Log("  - Middle Mouse: Pan viewport", LogLevel::Trace);
```

Sprite Sheet Editor Panel

For importing sprite sheet atlases.

Importing Sprite Sheets

1. **Load Texture** - Select sprite sheet image, drag and drop also support from content browser panel
2. **Configure Grid:**
    - **Cell Width/Height** - Size of each sprite in pixels
    - **Spacing** - Pixels between sprites
    - **Padding** - Starting position in texture
3. **Preview Grid** - Overlay shows slice boundaries
4. **Add to Frame Library** - Create individual frame from selected cell in preview grid
5. **Export to Animation** - Create animation clip from sequence (Can then be viewed in the content browser and in the Animation Editor)



Texture: 576x96

Grid Configuration

```
6      Columns
1      Rows
96     Cell Width (px)
96     Cell Height (px)
0      Padding
0      Spacing
```

Selected Cell: [1, 0]
UV Min: (0.167, 0.000)
UV Max: (0.333, 1.000)

Frame Library (2 frames)

FPS: 60.1
Entities: 5
State: Edit

Animation System

PillarEditor includes comprehensive sprite animation tools for frame-by-frame animation.

Animation Manager Panel

Animation Manager panel

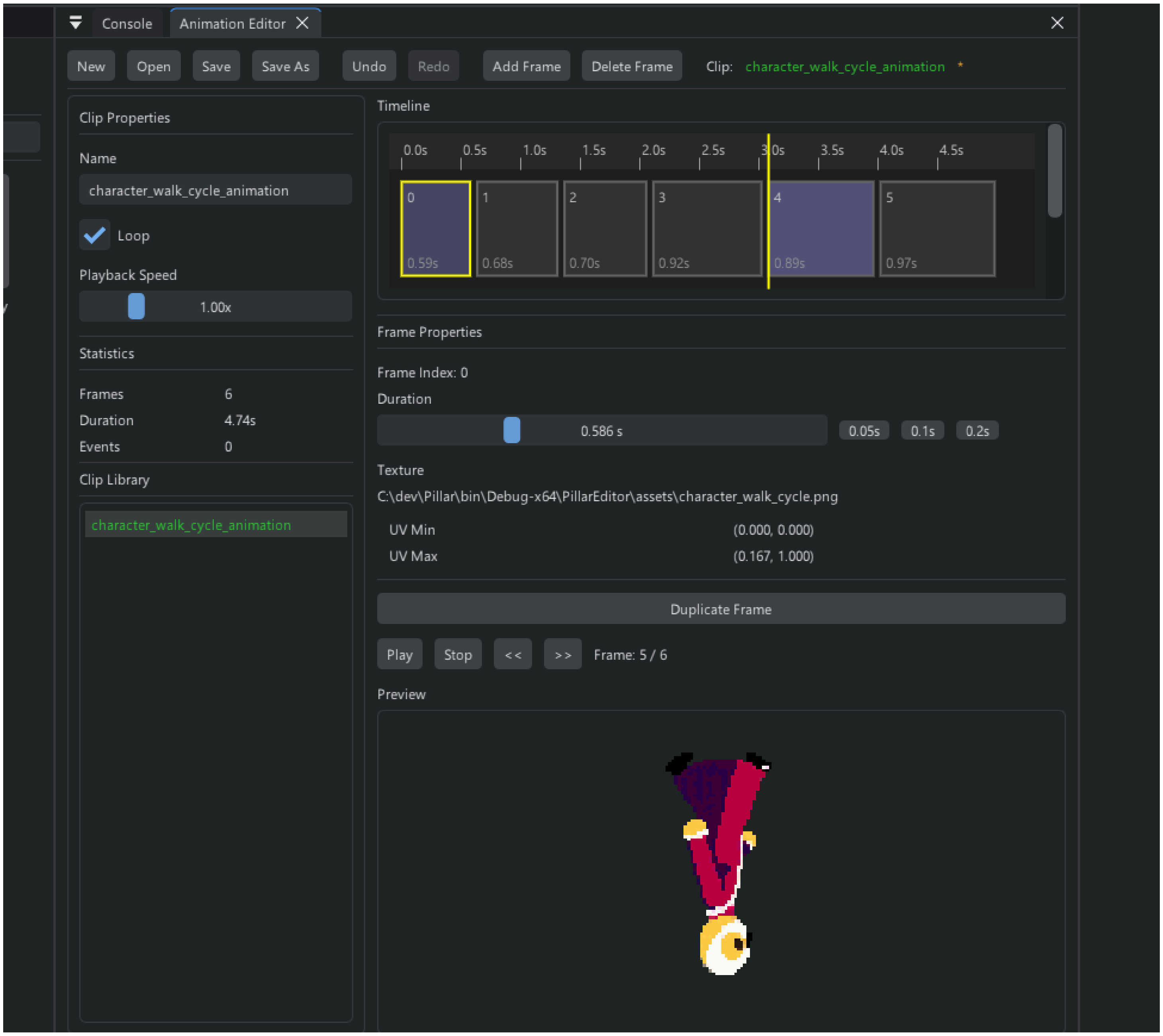
Creating Animation Clips

1. Once frame library is complete in the **Sprite Sheet Editor**, Click **"Export to Animation"**, the clip will be then available in the animation editor as well as in your assets/animations, the json will be visiblel.
2. In the Animation editor, you can:
   - Duplicate frames
   - Set frame duration (seconds per frame)
   - Reorder frames by dragging
3. **Set Properties:**
   - **Looping** - Repeat animation
   - **Speed** - Playback speed multiplier

4. **Save Clip** - Saves as `.anim.json` file

Animation Clip Properties

- **Clip Name** - Display name
- **Total Duration** - Sum of all frame durations
- **Frame Count** - Number of frames
- **Default Loop** - Enable looping



Using Animations in Game

1. Add **Animation Component** to entity
2. Add **Sprite Component** to entity (required)

3. Select animation clip in component dropdown
4. Animation plays automatically in play mode

Code Example:

```
// Playing animations via script
auto& anim = entity.GetComponent<AnimationComponent>();
anim.Play("walk_right");
anim.SetSpeed(1.5f);

// Animation events
anim.OnAnimationComplete = [](entt::entity e) {
    // Animation finished
};
```

Entity Templates

Templates are reusable entity presets that speed up development. Create once, instantiate many times.

Template Library Panel

Creating Templates

Method 1: From Scene Hierarchy

1. Set up an entity with desired components
2. Right-click entity in hierarchy
3. Select **"Save as Template"**
4. Name the template

Method 2: JSON Files

Create `.template.json` files in `assets/templates/` :

```json
{
    "name": "Player",
    "description": "Playable character template",
    "components": {
        "Transform": { "Position": [0, 0], "Scale": [1, 1] },
        "Sprite": { "Color": [0.2, 0.8, 0.3, 1.0] },
        "Velocity": { "Velocity": [0, 0] },
        "Rigidbody": { "BodyType": "Dynamic" },
        "CircleCollider": { "Radius": 0.5 }
    }
}
```

Using Templates

Method 1: Template Library Panel

1. Browse templates in Template Library
2. Click **"Instantiate"** button

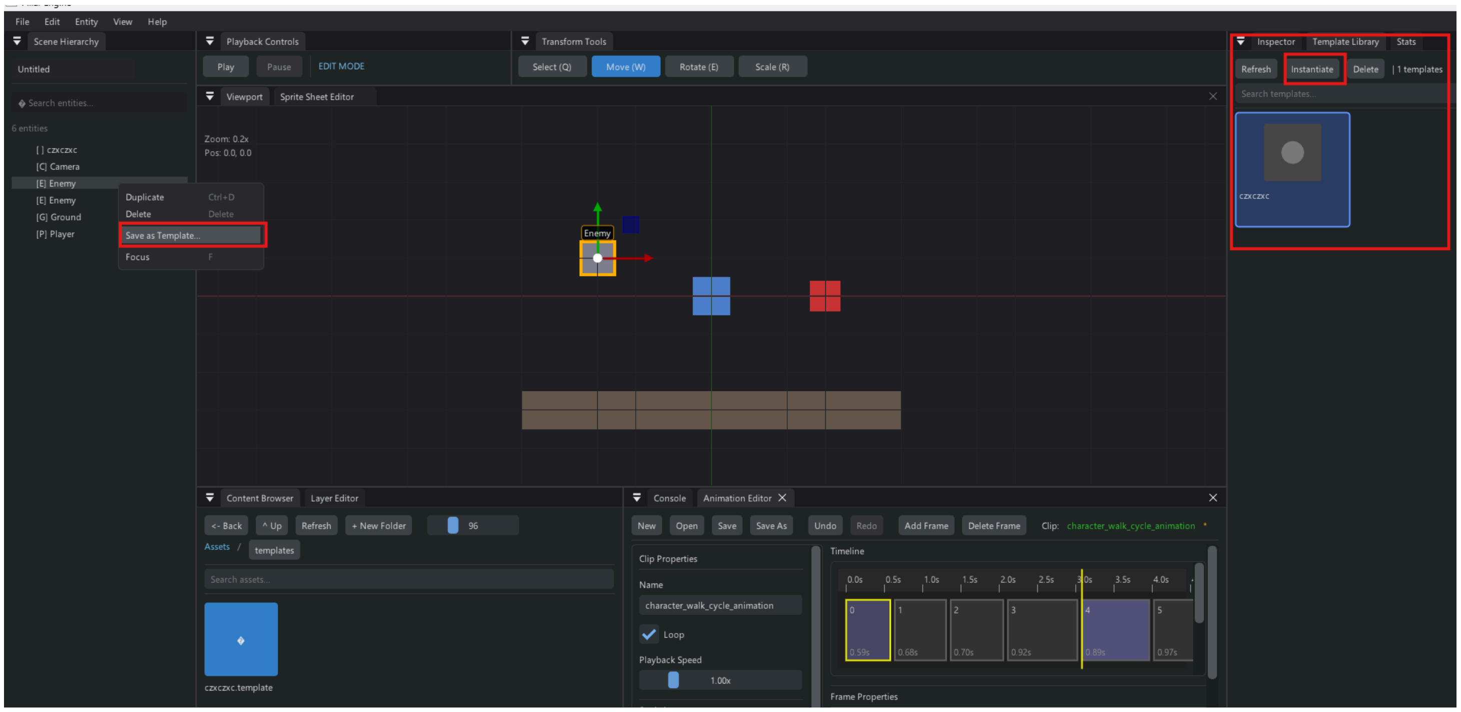
Method 2: Scene Hierarchy

1. Right-click in Scene Hierarchy
2. Select **"Create from Template"**
3. Choose template from list

Built-in Templates

PillarEditor includes common templates:

- **Player** - Character with physics and collision
- **Enemy** - Basic enemy setup
- **Wall** - Static physics obstacle
- **Collectible** - Item with trigger collider
- **Bullet** - Projectile with lifetime
- **Camera** - Standard game camera



Working with Scenes

Scene File Format

Scenes are saved as JSON files (`.scene.json`) containing:

- Entity hierarchy
- Component data
- Scene settings
- Asset references

Recommended Location: `assets/scenes/Level1.scene.json`

Creating New Scenes

1. File → New Scene (Ctrl+N)
2. Confirms save of current scene if modified
3. Creates empty scene with default camera

Opening Scenes

Method 1: File Menu

- File → Open Scene (Ctrl+O)
- Navigate to `.scene.json` file

Method 2: Content Browser

- Double-click scene file

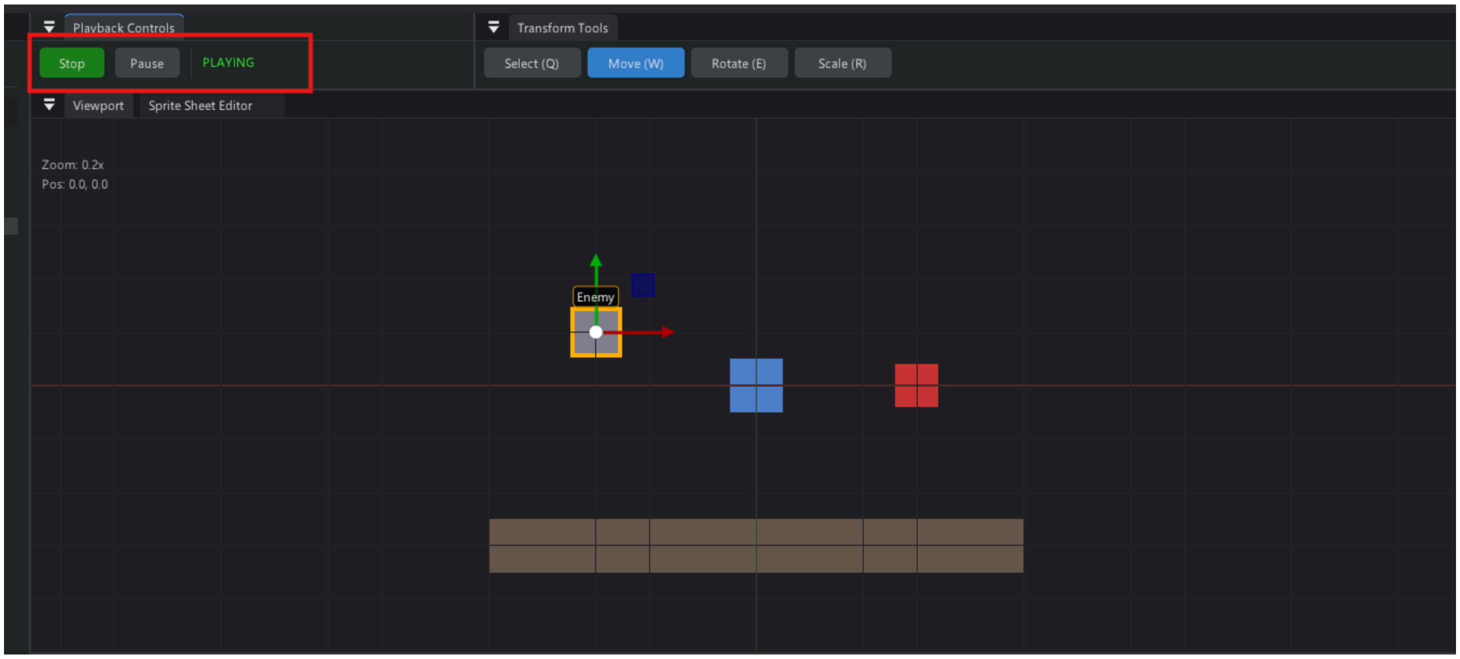
Saving Scenes

- **Save** (Ctrl+S) - Quick save to current file
- **Save As** (Ctrl+Shift+S) - Save with new filename

Best Practice: Save frequently! The editor has auto-save, but manual saves ensure data safety.

Play Mode

Play Mode allows you to test your game directly in the editor without building.



Entering Play Mode

Methods:

- Click **Play Button** ▶ in viewport toolbar
- Press **Ctrl+P**

What Happens:

1. Current scene state is backed up
2. All game systems activate (physics, audio, animation)
3. Viewport switches to game camera
4. Editor UI remains active for debugging

Play Mode Features

- **Full Physics Simulation** - Box2D runs normally
- **Input Handling** - WASD, mouse, etc. work as in game
- **Audio Playback** - Sounds play with 3D positioning
- **Animation Playback** - Sprite animations play
- **Live Inspector** - Watch component values update in real-time

Warning: Edits made in play mode are NOT saved!

Pausing Simulation

Click **Pause Button ⏸** or press **Ctrl+Shift+Pause** to pause simulation:

- Physics stops updating
- Audio pauses
- Animations freeze
- Inspect entity states without changes

Click pause again to resume.

Exiting Play Mode

Methods:

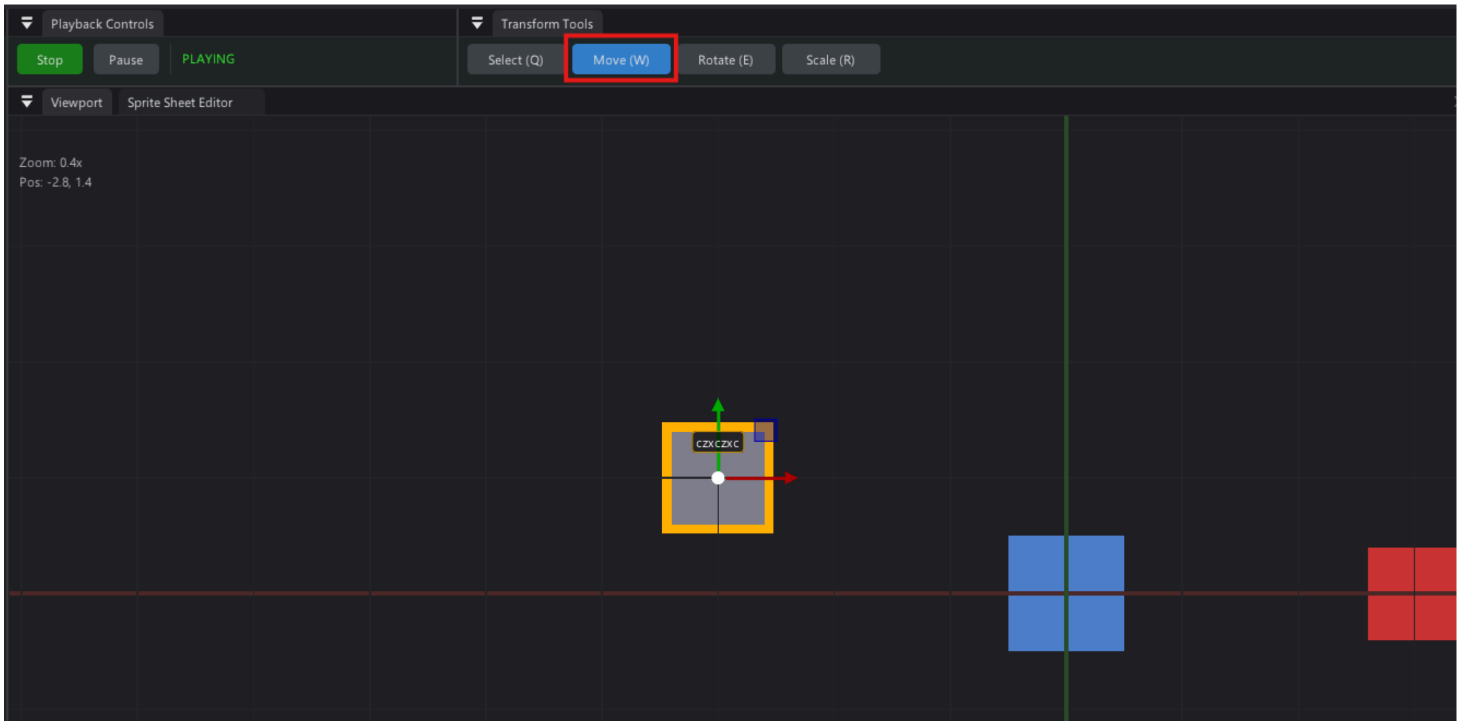
- Click **Stop Button** ■ in toolbar
- Press **Ctrl+Shift+P**

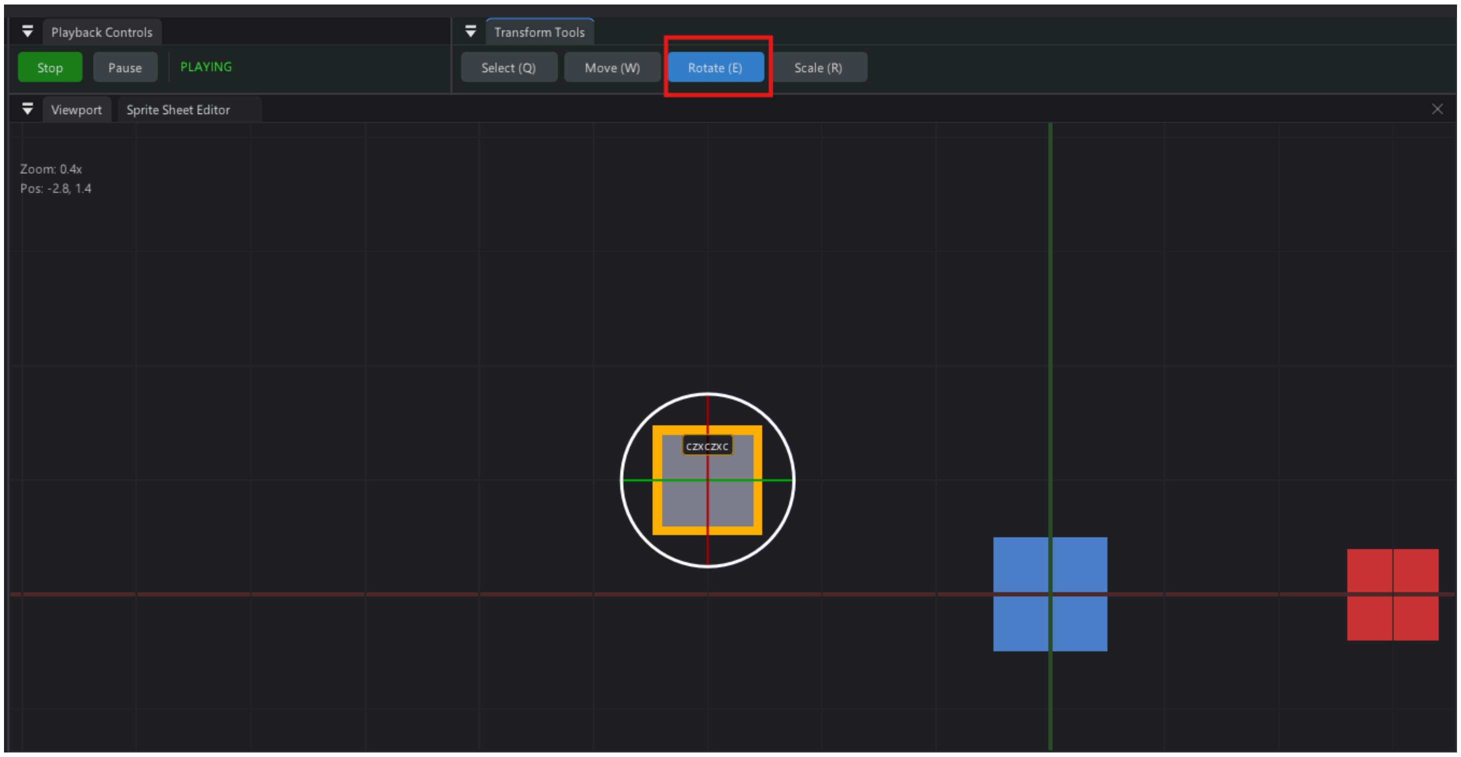
What Happens:

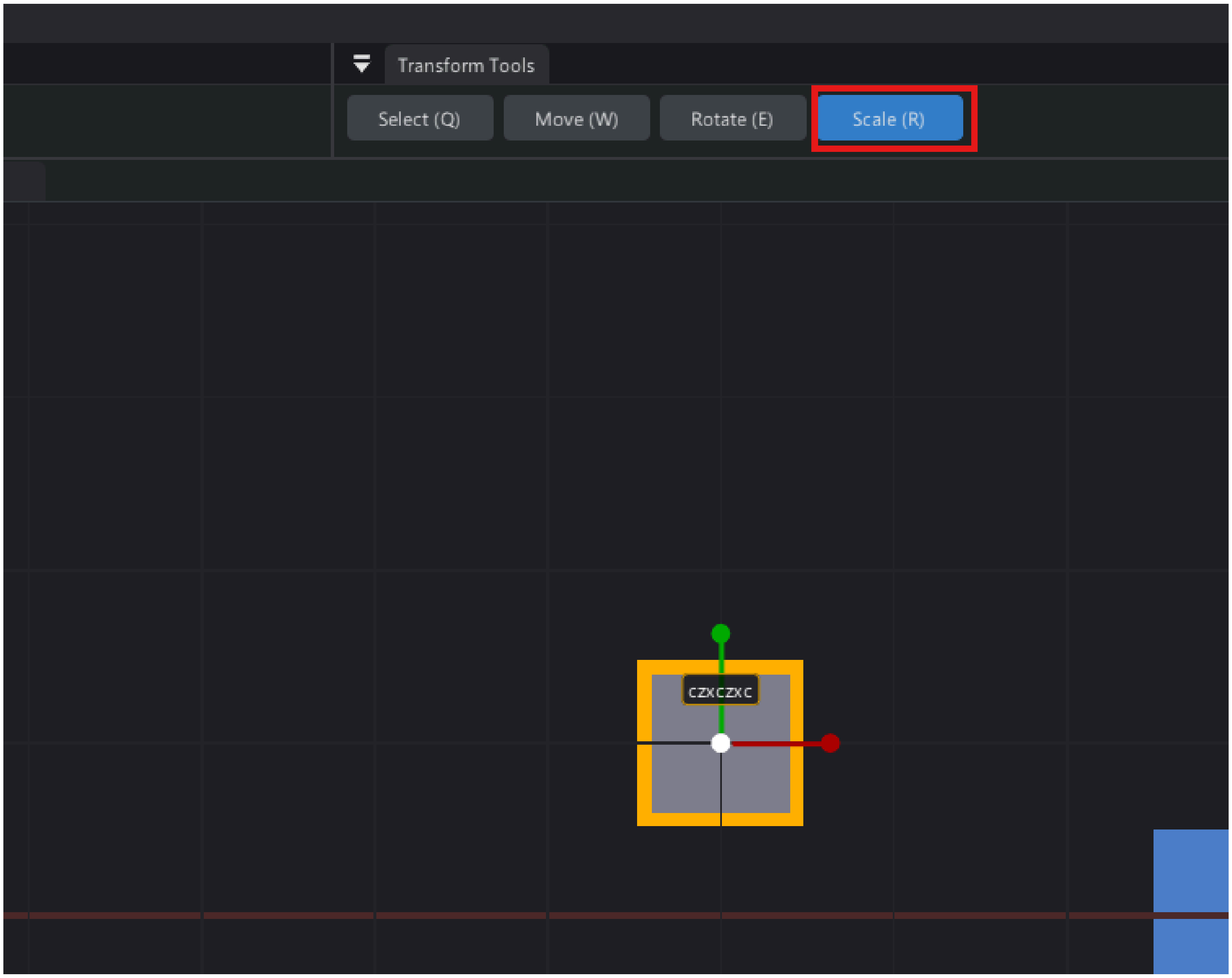
1. Simulation stops
2. Scene state is restored to pre-play snapshot
3. All temporary runtime changes are discarded
4. Editor camera is restored

Transform Gizmos

Gizmos are visual tools for manipulating entity transforms directly in the viewport.







Gizmo Modes

Mode	Hotkey	Icon	Purpose
Translate/Move	W	⊕	Move entity position
Rotate	E	⟲	Rotate entity
Scale	R	⊡	Change entity size

Using Translate Gizmo

- **Red Arrow (X-axis)** - Drag to move horizontally
- **Green Arrow (Y-axis)** - Drag to move vertically
- **Blue Square/ White dot(Center)** - Drag to move in any direction

Snapping:

- Hold **Ctrl** while dragging to snap to grid (configurable increment)

Using Rotate Gizmo

- **White Circle** - Drag around circle to rotate
- Shows angle indicator as you drag

Snapping:

- Hold **Ctrl** to snap to 15-degree increments

Using Scale Gizmo

- **Red Handle (X-axis)** - Scale width
- **Green Handle (Y-axis)** - Scale height
- **Yellow Square (Center)** - Uniform scale (proportional)

Snapping:

- Hold **Ctrl** to snap to 0.1 increments

Gizmo Settings

Gizmos are fully integrated with:

- **Undo/Redo** - All gizmo operations can be undone (Ctrl+Z)
- **Multi-Select** - Transform multiple entities at once (moves all selected entities)
- **Coordinate Space** - Local vs. World space toggle (future feature)

Undo/Redo System

PillarEditor includes a comprehensive undo/redo system for all editing operations.

Supported Operations

- **Transform Changes** - Position, rotation, scale
- **Component Edits** - Any component property change

- **Entity Creation/Deletion**
- **Component Add/Remove**
- **Hierarchy Changes** - Parenting operations

Using Undo/Redo

Undo:

- Edit → Undo
- **Ctrl+Z**

Redo:

- Edit → Redo
- **Ctrl+Y** or **Ctrl+Shift+Z**

Command History

The editor maintains a history of the last **100 commands**. Older commands are automatically removed to save memory.

Keyboard Shortcuts

General

Shortcut	Action
Ctrl+N	New Scene
Ctrl+O	Open Scene
Ctrl+S	Save Scene
Ctrl+Shift+S	Save Scene As
Ctrl+Z	Undo
Ctrl+Y	Redo
Ctrl+D	Duplicate Entity

Shortcut	Action
Delete	Delete Entity

Viewport

Shortcut	Action
MMB (Hold)	Pan Camera
Mouse Wheel	Zoom In/Out
F	Focus on Selected Entity
W	Translate Gizmo Mode
E	Rotate Gizmo Mode
R	Scale Gizmo Mode

Entity Hierarchy

Shortcut	Action
Ctrl+Click	Multi-Select Toggle

Gizmo Modifiers

Shortcut	Action
Ctrl+Drag	Snap to Grid/Increment

Tips & Best Practices

Organization

1. **Use Meaningful Names** - Name entities descriptively ("Player", "Enemy_Goblin", "Wall_Left")
2. **Layer Your Sprites** - Use Sorting Layers to control render order
3. **Folder Structure** - Organize assets into `textures/` , `audio/sfx/` , `audio/music/` , `scenes/`

Debugging

1. **Watch the Console** - Check for warnings/errors regularly
2. **Use Inspector in Play Mode** - Watch values update live
3. **Selection Highlighting** - Orange outlines help identify selected entities
4. **Pause to Inspect** - Use pause button to freeze simulation and examine state

Component Setup

1. **Transform First** - Set position/scale before adding other components
2. **Physics Pairs** - Always pair Rigidbody with a Collider
3. **Sprite + Animation** - Animation requires Sprite component
4. **Test Colliders** - Use play mode to verify collision shapes

Asset Management

1. **Relative Paths** - Keep all assets in `assets/` folder
2. **PNG for Transparency** - Use PNG for sprites with alpha channel
3. **WAV for Audio** - Only WAV format is currently supported
4. **Scene Backups** - Keep backup copies of important scenes
5. **Version Control** - Use Git to track scene and asset changes

Appendix

File Formats

Scene File (.scene.json)

JSON format containing:

- Entity list with UUIDs
- Component data for each entity
- Hierarchy relationships
- Asset references (paths)

Animation Clip (.anim.json)

JSON format containing:

- Frame list with texture paths
- Frame durations
- Looping flag
- Total duration

Entity Template (.template.json)

JSON format containing:

- Template name and description
- Component type list
- Default component values

Asset Paths

PillarEditor uses relative paths from project root:

- Textures: `assets/textures/`
- Audio: `assets/audio/`
- Scenes: `assets/scenes/`
- Animations: `assets/animations/`
- Templates: `assets/templates/`

During development, the editor searches:

1. `PillarEditor/assets/` (for editor testing)
2. `assets/` next to executable (for distribution)

Getting Help

Resources

- **Engine Guide**: See `USERS_GUIDE.md` for Pillar Engine API reference
- **Installation**: See `INSTALLATION_GUIDE.md` for build instructions

Feature Requests

We welcome suggestions! Consider:

- What problem does it solve?
- How would the UI/UX work?
- Is there a workaround currently?

End of PillarEditor User's Guide

Happy game making!