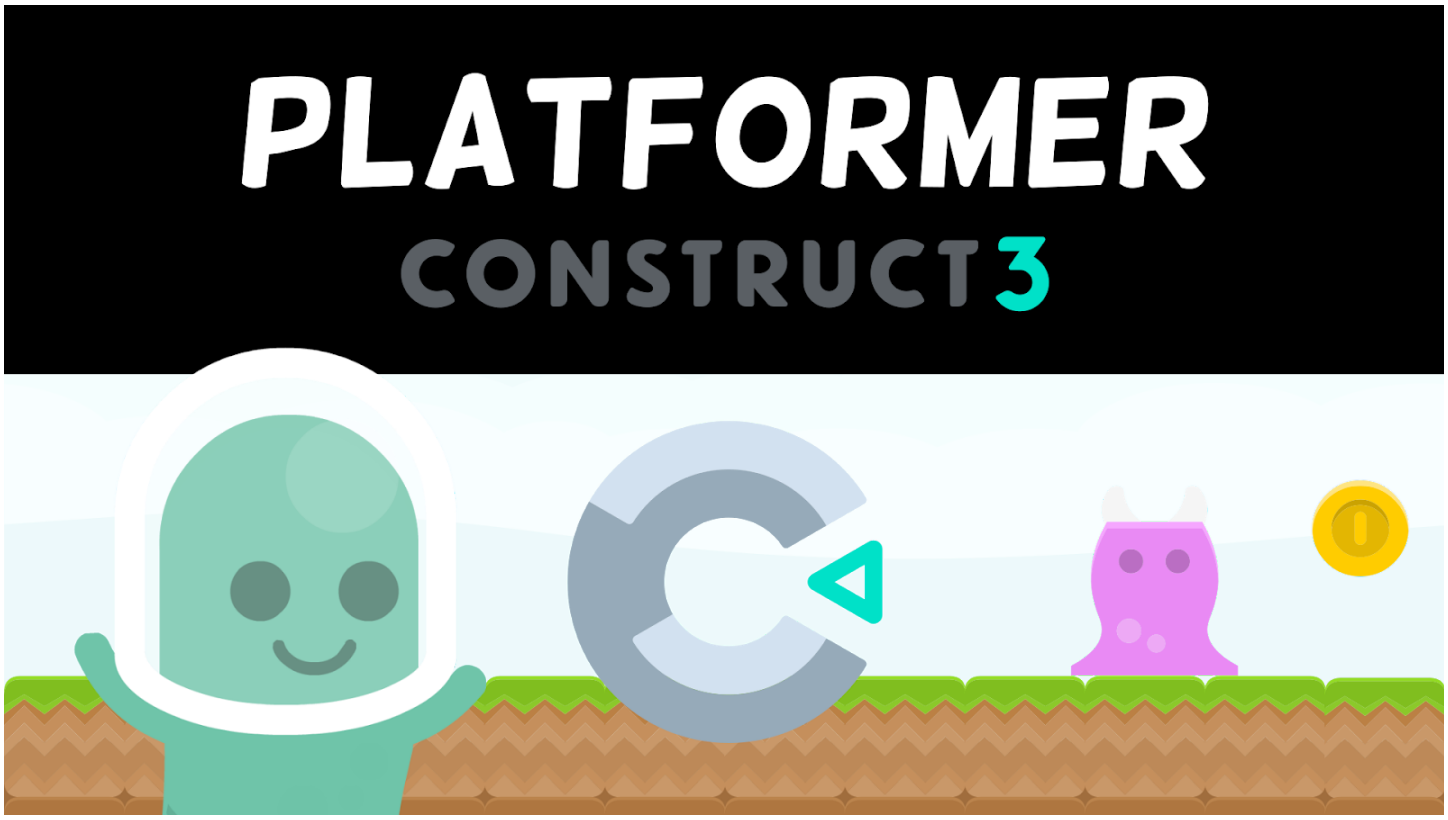


# Game Project Guide

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## Game Assets

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Download the Game Assets | Download zip archive containing project files, staging somewhere convenient, e.g., Desktop, My Documents, USB flash drive, etc. |
| ❑ | Extract Files | Extract archive, using program of choice, to desired location on computer/flash drive |

## Creating the Project

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Launch Construct 3 | Navigate to **editor.construct.net** in your browser, e.g., Chrome |
| ❑ | Log in to Construct 3 | ■ USER ACCOUNT > LOG IN<br>○ **Username**: <enter Construct 3 username><br>○ **Password**: <enter Construct 3 password><br>○ Click "**Log in**" |
| ❑ | Change Site Settings | ■ To the left of the web address i.e., **https://editor.construct.net**, click the lock icon<br>■ Click "**Site Settings**"<br>■ Change "**Pop-ups and redirects**" to "**Allow**"<br>■ Reload page for changes to take effect |
| ❑ | Create New Project | ■ PROJECT > NEW<br>○ New Project<br>■ **Name**: Platformer<br>■ **Choose preset**: 1080p landscape<br>■ Select CREATE |
| ❑ | Save Project* | ■ PROJECT > SAVE AS > CLOUD SAVE<br>■ Select a cloud service, e.g., Dropbox, OneDrive, Google Drive<br>■ Authenticate and authorize service<br>■ Navigate to desired storage location, and save project using "**Platformer.c3p**" for the filename<br>■ Select SAVE<br><br>**Note**: To access your project in the future:<br>○ PROJECT > OPEN RECENT > "**Platformer.c3p**"<br>**- OR -**<br>○ PROJECT > CLOUD OPEN > Navigate to "**Platformer.c3p**" |

* Assumes use of Google Drive

## Project Properties

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Set Project Properties | ■ Select "Platformer" > Set/confirm the following properties:<br>○ About<br>■ **Name**: Platformer<br>■ **Version**: 1.0.0.0<br>■ **Description**: A model platform-style game<br>■ **ID**: com.colestock.game.platformer<br>■ **Author**: <enter your name><br>■ **Email**: <enter your email><br>■ **Website**: <enter your website><br>○ Startup<br>■ **First layout**: Layout 1<br>■ **Loader style**: Percentage text<br>○ Display<br>■ **Viewport size** (Width x Height): 1920 x 1080<br>■ **Orientations**: Landscape<br>○ Editor<br>■ Check "**Bundle addons**" |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## Setting the Stage

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Rename Layout | Right-click "Layout 1" > Rename to "**Level 1**" |
| ❑ | Rename Event Sheet | Right-click "Event sheet 1" > Rename to "**Level 1 Event Sheet**" |
| ❑ | Set Layout Properties | ■ Select "Level 1" > Set the following properties:<br>○ Layout<br>■ **Size** (Width x Height): 3840 x 1080<br>○ Editor<br>■ **Margins** (Width x Height): 500 x 500<br>■ Check "**Show grid**"<br>■ Check "**Snap to grid**"<br>■ **Grid size** (Width x Height): 96 x 96 |
| ❑ | Rename "Layer 0" | Right-click "Layer 0" > Rename to "**Background**" |
| ❑ | Create Sky Tiled Background | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Tiled Background" > Name: "**Sky**" > INSERT |

| | | |
|---|---|---|
| | | ■ When crosshair appears, click inside "Level 1" layout > Tiled Background Editor will appear<br>■ Click folder icon > Browse to and OPEN: **sky-background-1024x1024.png**<br>■ Click X to close; Sky object should be on "Background" layer |
| ❑ | Position Sky Background | Snap the Sky object to the upper left-hand corner of the layout (0,0) and enlarge until it covers the entire layout; it is OK if it covers more than the visible layout |
| ❑ | Create Ground | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Ground**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **ground-96x96.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **0**<br>■ Click X to close; Ground object should be on "Background" layer |
| ❑ | Duplicate Ground | Create a 40 x 2 (Width x Height) section of Ground objects using **Ctrl + drag** (left mouse button) at the bottom of the layout |
| ❑ | Lock "Background" Layer | Select "Background" layer > Click lock icon |
| ❑ | Create "Game" Layer | ■ Under "Layers" > Right-click "**Add layer at top**" > Rename new layer to "**Game**"<br>■ Make sure the "Game" layer is active, unlocked, and listed **above** the "Background" layer |
| ❑ | Create Grass | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Grass**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **grass-96x96.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **0**<br>■ Click X to close; Grass object should be on "Game" layer |
| ❑ | Duplicate Grass | Create a 40 x 1 (Width x Height) section of Grass objects using **Ctrl + drag** (left mouse button) on top of the Ground |

| | | |
|---|---|---|
| ❑ | Create "Solids" Family | ■ Right-click FAMILIES > Select "Add family"<br>○ Click "**Grass**"<br>○ Click "Add" to place in family > OK<br>■ Right-click "Family1" > Rename to "**Solids**" |
| ❑ | Assign Behavior to "Solids" Family | ■ Right-click "Solids" Family > Select "Family Behaviors"<br>○ Click "**Add new behavior**"<br>○ Select "**Solid**" under "Attributes" > ADD<br>○ Click X to close |
| ❑ | Lock "Game" Layer | Select "Game" layer > Click lock icon |
| ❑ | Unlock "Background" Layer | Select "Background" layer > Click lock icon |
| ❑ | Create Bush | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Bush**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **bush-96x58.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **58**<br>■ Click X to close; Bush object should be on "Background" layer |
| ❑ | Duplicate Bush | Create a couple of Bush objects using **Ctrl + drag** (left mouse button) on top of the Grass.<br><br>**Note**: Check and uncheck "Snap to grid" option for maximum control over placement of objects on the layout! |
| ❑ | Lock "Background" Layer | Select "Background" layer > Click lock icon |
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

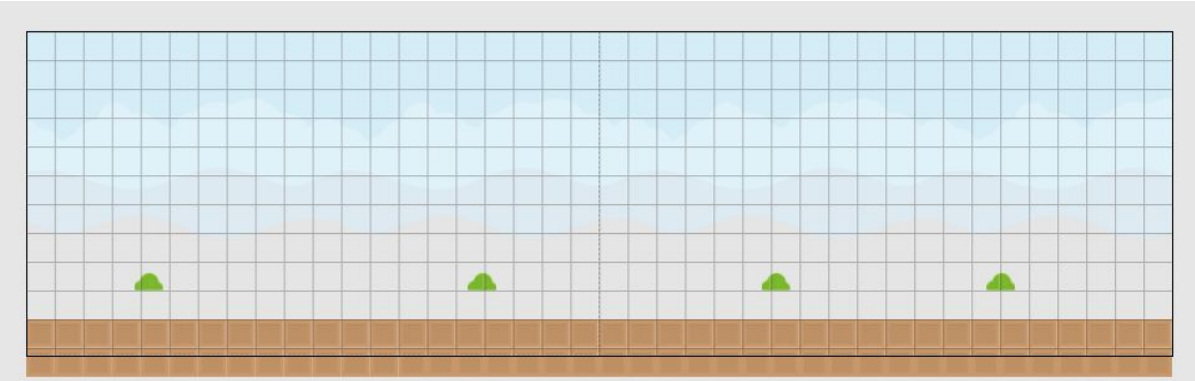

**FIGURE 1**: Snapshot of "Level 1" Layout ("Background" layer only)

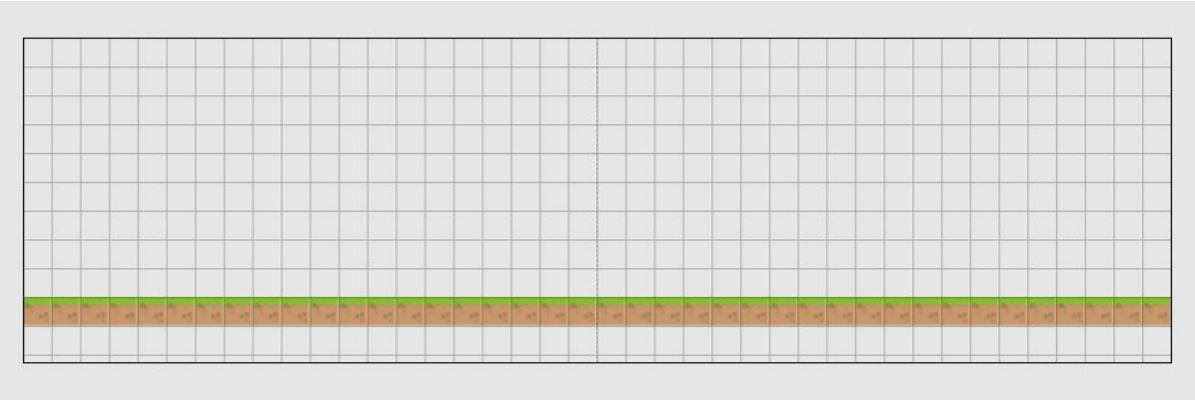

**FIGURE 2**: Snapshot of "Level 1" Layout ("Game" layer only)

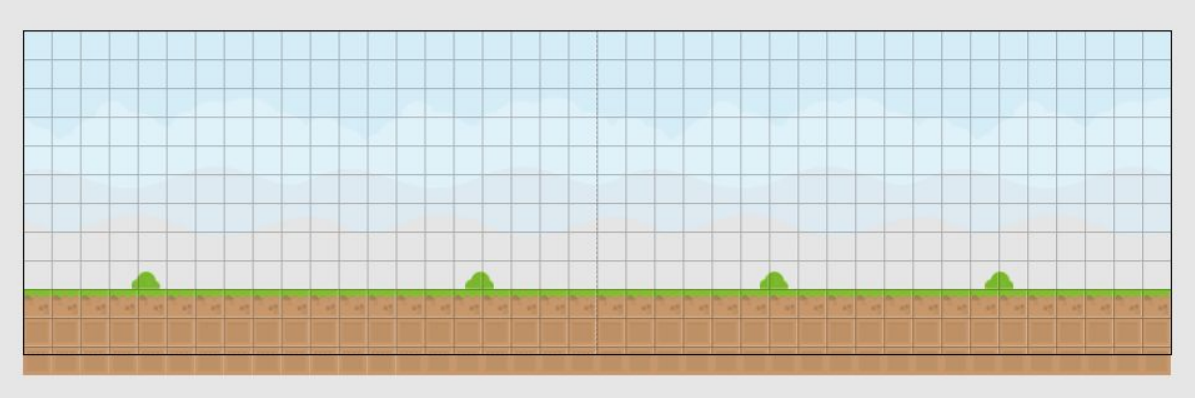

**FIGURE 3**: Snapshot of "Level 1" Layout (all layers)

# The Player

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Player | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Player**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Select "Resize" option:<br>○ Image Canvas Size<br>■ **Width** (pixels): 85<br>■ **Height** (pixels): 117<br>○ Select OK<br>■ Select "Fill" option:<br>○ Enter Custom Color (in color palette)<br>■ **Red**: 111<br>■ **Green**: 196<br>■ **Blue**: 169<br>■ **Alpha**: 255<br>○ Click on canvas to fill object<br>■ Select "Edit the collision polygon" option<br>○ Right-click "**Set to bounding box**"<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **43**<br>■ Set **Y** to **117**<br>■ Click X to close; Player object should be on "Game" layer |
| ❑ | Assign Behaviors to the Player | ■ Right-click "**Player**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**" to add each behavior:<br>○ Select "**Platform**" under "Movements" > ADD<br>○ Select "**Bound to layout**" under "General" > ADD<br>○ Select "**Scroll To**" under "General" > ADD<br>○ Click X to close |
| ❑ | Set Player Platform Behavior Properties | ■ Select "**Player**" > Set the following properties:<br>○ Behaviors (Platform)<br>■ **Deceleration**: 1200<br>■ **Jump strength**: 800 |
| ❑ | Assign Player to "Solids" Family | ■ Select "**Solids**" Family > Right-click "Edit family"<br>○ Click "**Player**"<br>○ Click "Add" to place in family > OK |

| | | |
|---|---|---|
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## The Alien

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Alien | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Alien**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **alien-stand-76x113.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **38**<br>■ Set **Y** to **113**<br>■ Click X to close; Alien object should be on "Game" layer |
| ❑ | Rename Default Animation | ■ Right-click "**Alien**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Animation 1**" > Rename to "**Stand**" |
| ❑ | Create "Walk" Animation | ■ Right-click "**Alien**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Add Animation**" > Rename new animation to "**Walk**"; make sure it is selected<br>■ Create a four-frame animation: |

| Frame # | Image | Origin (X,Y) |
|---|---|---|
| **Frame 0** | alien-walk-77x117.png | 39, 117 |
| **Frame 1** | alien-walk-80x115.png | 40, 115 |
| **Frame 2** | alien-walk-77x117.png | 39, 117 |
| **Frame 3** | alien-walk-77x115.png | 39, 115 |

■ For **each frame** you need to:
○ Right-click "**Add Frame**" within "Frames" and select (not necessary for Frame 0)
○ Click the **folder icon** and **navigate to the image file**
○ Select "**Edit the image points**" option

| | | |
|---|---|---|
| | | ○ Change existing "Origin" image point to reflect the **X and Y values**<br>■ Right-click "Delete" any remaining empty frames<br>■ Click X to close the "Animations Editor" window |
| ❑ | Set "Walk" Animation Properties | ■ Right-click "**Alien**" > Select "Edit animations" > Select "**Walk**"<br>○ Animation Properties<br>■ **Speed**: 8<br>■ Check "**Loop**"<br>■ Click X to close |
| ❑ | Create "Jump" Animation | ■ Right-click "**Alien**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Add Animation**" > Rename new animation to "**Jump**"; make sure it is selected<br>■ Click folder icon > Browse to and OPEN: **alien-jump-85x115.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **43**<br>■ Set **Y** to **115**<br>■ Click X to close |
| ❑ | Create "Fall" Animation | ■ Right-click "**Alien**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Add Animation**" > Rename new animation to "**Fall**"; make sure it is selected<br>■ Click folder icon > Browse to and OPEN: **alien-fall-83x117.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **42**<br>■ Set **Y** to **117**<br>■ Click X to close |
| ❑ | Create "Success" Animation | ■ Right-click "**Alien**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Add Animation**" > Rename new animation to "**Success**"; make sure it is selected<br>■ Click folder icon > Browse to and OPEN: **alien-success-83x112.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **42**<br>■ Set **Y** to **112**<br>■ Click X to close |

| | | |
|---|---|---|
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## On the Move

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Add Keyboard Object to Project | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Keyboard" > Name: "**Keyboard**" > INSERT |
| ❑ | Add Mouse Object to Project | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Mouse" > Name: "**Mouse**" > INSERT |
| ❑ | Create "Player Event Sheet" | ■ Right-click EVENT SHEETS > Select "Add event sheet"<br>■ Rename to "**Player Event Sheet**" |
| ❑ | Include "Player Event Sheet" in "Level 1 Event Sheet" | ■ Right-click "**Level 1 Event Sheet**" > Select "Open" (Optionally, double-click to open)<br>■ Right-click "**Include event sheet**" > Double-click "**Player Event Sheet**" |
| ❑ | Create "Movement" Event Group | ■ Right-click "**Player Event Sheet**" > Select "Open"<br>■ Right-click > "**Add group**"<br>○ **Name**: Movement<br>○ **Description**: Events and triggers related to player movement<br>○ Select OK |
| ❑ | Create Event to Position Alien (To Player) | ■ Click "**Add event to 'Movement'**"<br>○ Double-click "**System**"<br>○ Double-click "**Every tick**" (under "General")<br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set position to another object**" (under "Size & Position")<br>■ **Object**: Player<br>■ **Image point**: 0<br>○ Select DONE |
| ❑ | Hide the Player | ■ Select "**Player**" > Set the following property:<br>○ Properties<br>■ Uncheck "**Initially visible**" |
| ❑ | Create Keyboard Event to Mirror Alien | ■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Keyboard**"<br>○ Double-click "**On key pressed**" (under "Keyboard")<br>○ Click "**<click to choose>**" and press "**Left arrow**" > OK |

| | | |
|---|---|---|
| | | ○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set mirrored**" (under "Appearance")<br>■ **State**: Mirrored<br>○ Select DONE<br><br>■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Keyboard**"<br>○ Double-click "**On key pressed**" (under "Keyboard")<br>○ Click "**<click to choose>**" and press "**Right arrow**" > OK<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set mirrored**" (under "Appearance")<br>■ **State**: Not mirrored<br>○ Select DONE |
| ❑ | Add Keyboard Event for Alien "Walk" Animation | ■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Keyboard**"<br>○ Double-click "**Key is down**" (under "Keyboard")<br>○ Click "**<click to choose>**" and press "**Left arrow**" > OK<br>○ Select DONE<br><br>■ Right-click event > Select "**Make OR block**"<br><br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Keyboard**"<br>○ Double-click "**Key is down**" (under "Keyboard")<br>○ Click "**<click to choose>**" and press "**Right arrow**" > OK<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Walk"<br>○ Select DONE<br><br>■ Right-click event > Select "**Add**" > Select "**Add 'Else'**"<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Stand"<br>○ Select DONE |
| ❑ | Add "Platform is Jumping" Event | ■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Player**"<br>○ Double-click "**Is jumping**" (under "Platform")<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**" |

| | | |
|---|---|---|
| | | ○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Jump"<br>○ Select DONE |
| ❑ | Add "Platform Is Falling" Event | ■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Player**"<br>○ Double-click "**Is falling**" (under "Platform")<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Fall"<br>○ Select DONE |
| ❑ | Debug Layout | From "Level 1" layout > Click "Debug layout" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

**FIGURE 4**: Snapshot of "Level 1 Event Sheet" (after On The Move)

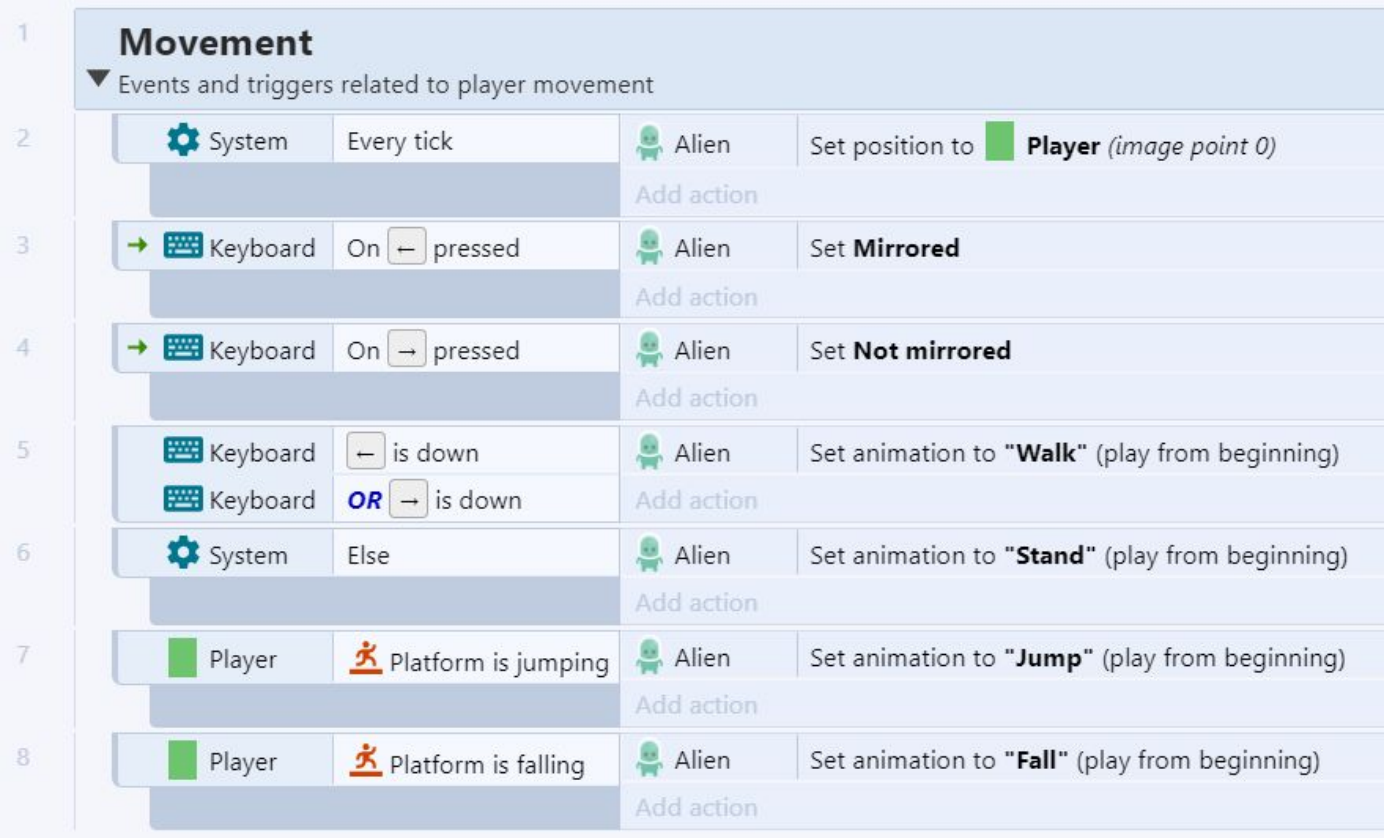


**FIGURE 5**: Snapshot of "Player Event Sheet" (after On The Move)

## Obstacles

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Grass Platform | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**GrassPlatform**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **grass-platform-96x56.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **56**<br>■ Click X to close; GrassPlatform object should be on "Game" layer |
| ❑ | Assign Grass Platform to "Solids" Family | ■ Select "**Solids**" Family > Right-click "Edit family"<br>○ Click "**GrassPlatform**"<br>○ Click "Add" to place in family > OK |
| ❑ | Duplicate Grass Platform | Create multiple Grass Platform objects using **Ctrl + drag** (left mouse button) for the player to jump on.<br><br>**Note**: Check and uncheck "Snap to grid" option for maximum control over placement of objects on the layout! |
| ❑ | Create Floating Bridge | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Bridge**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **floating-bridge-95x27.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **48**<br>■ Set **Y** to **14**<br>■ Click X to close; Bridge object should be on "Game" layer |
| ❑ | Assign Floating Bridge to "Solids" Family | ■ Select "**Solids**" Family > Right-click "Edit family"<br>○ Click "**Bridge**"<br>○ Click "Add" to place in family > OK |

| | | |
|---|---|---|
| ❑ | Assign Horizontal Sine Behavior to Floating Bridge | ■ Right-click "**Bridge**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Sine**" under "Movements" > ADD<br>○ Rename "**BridgeSideToSide**"<br>○ Click X to close |
| ❑ | Set Floating Bridge Properties | ■ Select "**Bridge**" > Set/confirm the following properties:<br>○ Behaviors (BridgeSideToSide)<br>■ **Movement**: Horizontal<br>■ **Period**: 10<br>■ **Magnitude**: 150<br>■ Check "**Preview**" (optional) |
| ❑ | Duplicate Floating Bridge | Create multiple Floating Bridge objects using **Ctrl + drag** (left mouse button) for the player to jump on.<br><br>**Note**: You can control (or vary) the movement of each bridge by adjusting its individual Sine behavior properties; explore additional properties to discover what they do! |
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## Cashin' In

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Get Coins Sign | ■ Make sure "Background" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**GetCoins**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **get-coins-96x96.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **96**<br>■ Click X to close; GetCoins object should be on "Background" layer<br>■ Position near the beginning of the layout |
| ❑ | Create Exit Sign | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type" |

| | | |
|---|---|---|
| | | ■ Select "Sprite" > Name: "**Exit**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **exit-96x96.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **96**<br>■ Click X to close; Exit object should be on "Game" layer<br>■ Position near the end of the layout |
| ❑ | Create Coin | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Coin**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **coin-48x48.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **24**<br>■ Set **Y** to **24**<br>■ Click X to close; Coin object should be on "Game" layer |
| ❑ | Duplicate Coin | Create multiple Coin objects using **Ctrl + drag** (left mouse button) for the player to collect.<br><br>**Note**: Check and uncheck "Snap to grid" option for maximum control over placement of objects on the layout. You can also add variation by rotation each coins using the rotation handle. |
| ❑ | Bring Alien to Top of Layer (Z Order) | ■ Make sure "Game" layer is active and unlocked<br>■ VIEW > BARS > Z-ORDER BAR (if bar is not visible)<br>■ Drag "Alien" to top of "Game" layer |
| ❑ | Create "Start & End Level Event Sheet" | ■ Right-click EVENT SHEETS > Select "Add event sheet"<br>■ Rename to "**Start & End Level Event Sheet**" |
| ❑ | Include "Start & End Level Event Sheet" in "Level 1 Event Sheet" | ■ Right-click "**Level 1 Event Sheet**" > Select "Open" (Optionally, you can double-click to open)<br>■ Right-click > "**Include event sheet**" > Double-click "**Start & End Level Event Sheet**" |

| | | |
|---|---|---|
| ❑ | Create Global Variable to Track Number of Coins Remaining | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br><br>■ Right-click "**Add global variable**":<br>○ **Name**: CoinsLeft<br>○ **Type**: Number<br>○ **Initial value**: 0<br>○ **Description**: Number of coins left on current game level<br>○ Select OK |
| ❑ | Create "Start of Level" Event Group | ■ Right-click > "**Add group**"<br>○ **Name**: Start of Level<br>○ **Description**: Events and triggers that occur at the beginning of any game-related layout<br>○ Select OK |
| ❑ | Create "On Start of Layout" Event and Action to Set CoinsLeft | ■ Click "**Add event to 'Start of Level'**"<br>○ Double-click "**System**"<br>○ Double-click "**On start of layout**" (under "Start & end")<br><br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Set value**" (under "Global & local variables")<br>■ **Variable**: CoinsLeft<br>■ **Value**: Coin.Count<br>○ Select DONE |
| ❑ | Create "Goal" Event Group | ■ Right-click "**Player Event Sheet**" > Select "Open"<br><br>■ Right-click > "**Add group**"<br>○ **Name**: Goal<br>○ **Description**: Events and triggers related to player goals<br>○ Select OK |
| ❑ | Create "On Player Collision with Coin" Event and Actions | ■ Click "**Add event to 'Goal'**"<br>○ Double-click "**Player**"<br>○ Double-click "**On collision with another object**" (under "Collisions")<br>■ **Object**: Coin<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Coin**"<br>○ Double-click "**Destroy**" (under "Misc")<br><br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Subtract from**" (under "Global & local variables")<br>■ **Variable**: CoinsLeft<br>■ **Value**: 1<br>○ Select DONE |

| | | |
|---|---|---|
| ❑ | Create "End of Level" Event Group | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br>■ Right-click > "**Add group**"<br>○ **Name**: End of Level<br>○ **Description**: Events and triggers related to ending any game-related layout<br>○ Select OK |
| ❑ | Create "Success" Event and Actions | ■ Click "**Add event to 'End of Level'**"<br>○ Double-click "**Player**"<br>○ Double-click "**On collision with another object**" (under "Collisions")<br>■ **Object**: Exit<br>○ Select DONE<br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**System**"<br>○ Double-click "**Compare variable**" (under "Global & local variables")<br>■ **Variable**: CoinsLeft<br>■ **Comparison**: = Equal to<br>■ **Value**: 0<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Wait**" (under "Time")<br>■ **Seconds**: 3.0<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Restart layout**" (under "Layout") |
| ❑ | Debug Layout | From "Level 1" layout > Click "Debug layout" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 🖫 |

**FIGURE 6**: Snapshot of "Level 1 Event Sheet" (after Cashin' In)

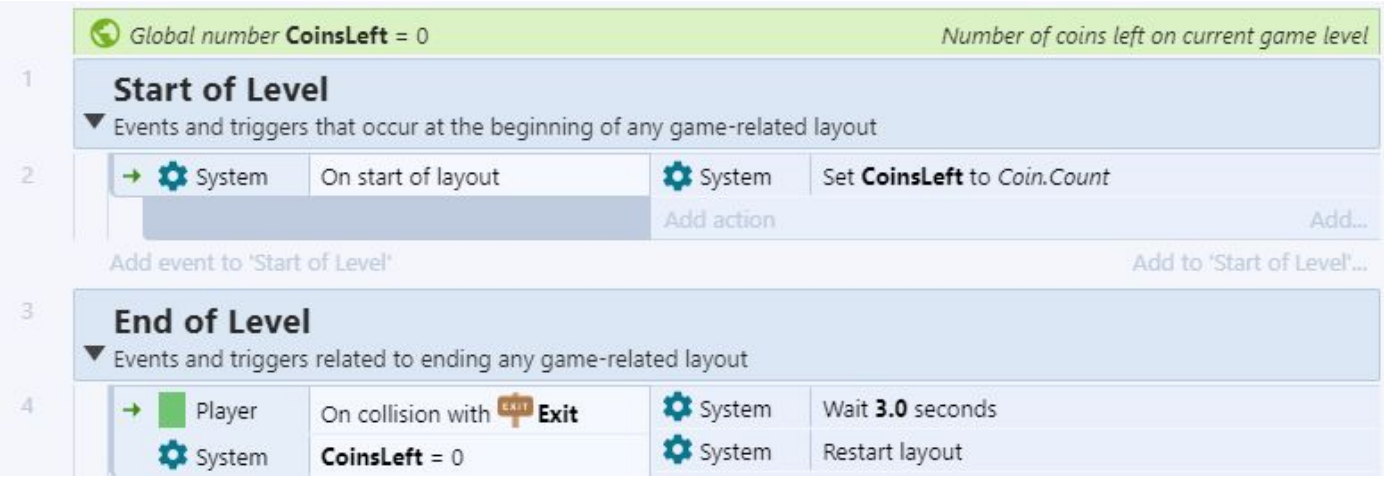


**FIGURE 7**: Snapshot of "Start & End Level Event Sheet" (after Cashin' In)

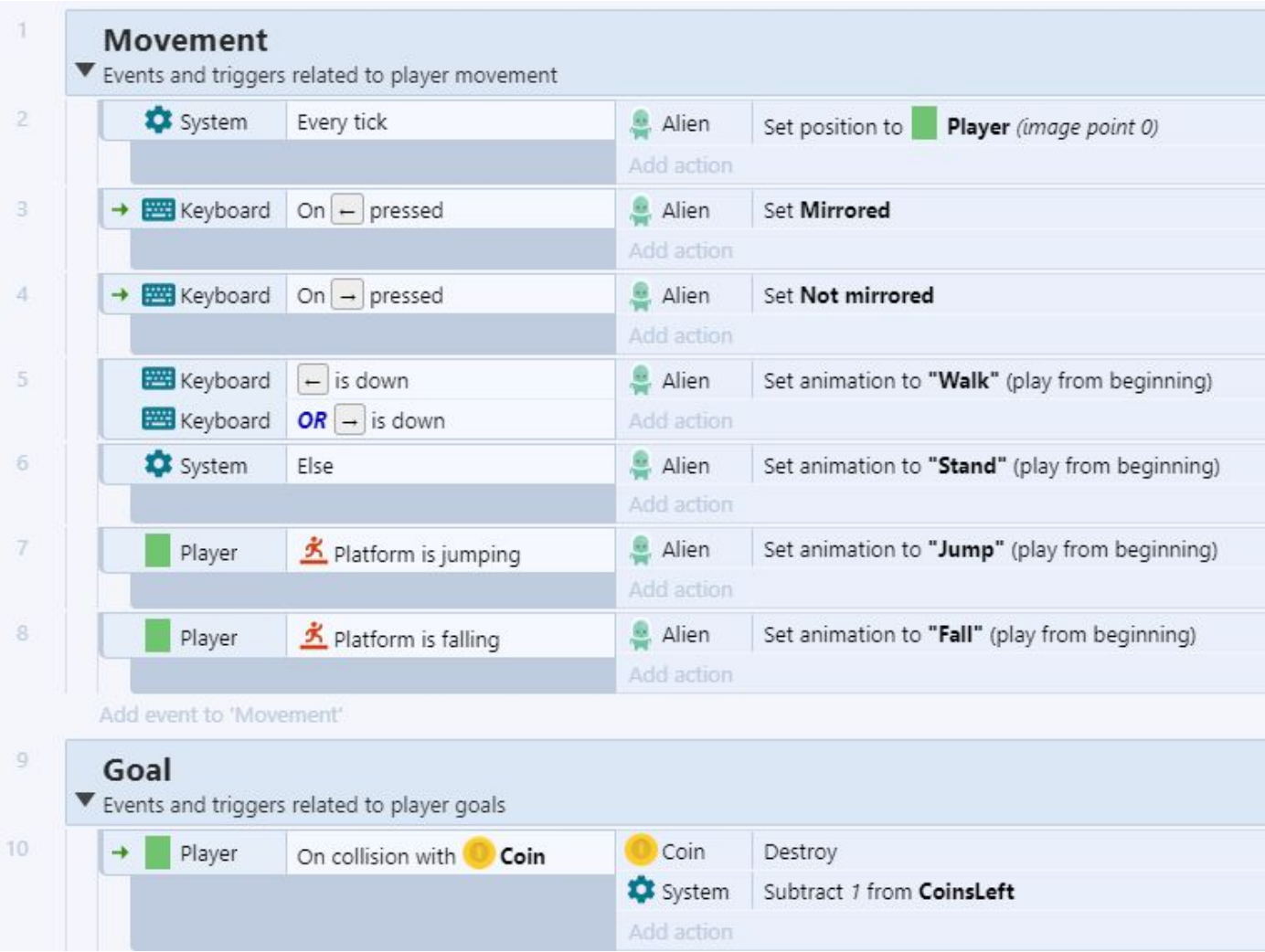


**FIGURE 8**: Snapshot of "Player Event Sheet" (after Cashin' In)

## Barnacles & Bees

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Barnacle | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Barnacle**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Within "Frames" > Right-click "**Import Frames**" > "**From Strip**"<br>■ Click folder icon > Browse to and OPEN: **barnacle-2x1-66x75.png**<br>■ When Import Sprite Strip dialog appears:<br>○ Number of horizontal cells: **2**<br>○ Number of vertical cells: **1**<br>○ Direction**: Horizontal**<br>○ Check "**Replace entire animation**"<br>○ Select IMPORT<br>■ Select "Edit the collision polygon" option<br>○ Right-click "**Guess the polygon shape**"<br>○ Right-click "**Apply to whole animation**"<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **33**<br>■ Set **Y** to **75**<br>○ Right-click "**Apply to whole animation**"<br>■ Click X to close; Barnacle object should be on "Game" layer |
| ❑ | Rename Default Animation | ■ Right-click "**Barnacle**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Animation 1**" > Rename to "**Chomp**" |
| ❑ | Set "Chomp" Animation Properties | ■ Right-click "**Barnacle**" > Select "Edit animations" > Select "**Chomp**"<br>○ Animation Properties<br>■ **Speed**: 2<br>■ Check "**Loop**"<br>■ Click X to close |
| ❑ | Create "Enemies" Family | ■ Right-click FAMILIES > Select "Add family"<br>○ Click "**Barnacle**"<br>○ Click "Add" to place in family > OK<br>■ Right-click "Family1" > Rename to "**Enemies**" |

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|---|---|---|
| ❑ | Duplicate Barnacle | Create multiple Barnacle objects using **Ctrl + drag** (left mouse button) for the player to avoid. |
| ❑ | Create Bee | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Bee**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Within "Frames" > Right-click "**Import Frames**" > "**From Strip**"<br>■ Click folder icon > Browse to and OPEN: **bee-2x1-93x72.png**<br>■ When Import Sprite Strip dialog appears:<br>○ Number of horizontal cells: **2**<br>○ Number of vertical cells: **1**<br>○ Direction**: Horizontal**<br>○ Check "**Replace entire animation**"<br>○ Select IMPORT<br>■ Select "Edit the collision polygon" option<br>○ Right-click "**Guess the polygon shape**"<br>○ Right-click "**Apply to whole animation**"<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **47**<br>■ Set **Y** to **36**<br>○ Right-click "**Apply to whole animation**"<br>■ Click X to close; Bee object should be on "Game" layer |
| ❑ | Rename Default Animation | ■ Right-click "**Bee**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Animation 1**" > Rename to "**Fly**" |
| ❑ | Set "Fly" Animation Properties | ■ Right-click "**Bee**" > Select "Edit animations" > Select "**Fly**":<br>○ Animation Properties<br>■ **Speed**: 5<br>■ Check "**Loop**"<br>■ Click X to close |
| ❑ | Assign Bee to "Enemies" Family | ■ Select "**Enemies**" Family > Right-click "Edit family"<br>○ Click "**Bee**"<br>○ Click "Add" to place in family > OK |
| ❑ | Assign Horizontal Sine Behavior to Bee | ■ Right-click "**Bee**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Sine**" under "Movements" > ADD<br>○ Rename "**BeeSideToSide**"<br>○ Click X to close |

| | | |
|---|---|---|
| ❑ | Assign Vertical Sine Behavior to Bee | ■ Right-click "**Bee**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Sine**" under "Movements" > ADD<br>○ Rename "**BeeUpDown**"<br>○ Click X to close |
| ❑ | Set Bee Properties | ■ Select "**Bee**" > Set/confirm the following properties:<br>○ Behaviors (BeeSideToSide)<br>■ **Movement**: Horizontal<br>■ **Period**: 8<br>■ **Period random**: 15<br>■ **Period offset random**: 5<br>■ **Magnitude**: 50<br>■ **Magnitude random**: 15<br>■ Check "**Preview**" (optional)<br>○ Behaviors (BeeUpDown)<br>■ **Movement**: Vertical<br>■ **Period**: 8<br>■ **Period random**: 15<br>■ **Magnitude**: 25<br>■ **Magnitude random**: 5<br>■ Check "**Preview**" (optional) |
| ❑ | Duplicate Bee | Create multiple Bee objects using **Ctrl + drag** (left mouse button) for the player to avoid.<br><br>**Note**: You can control (or vary) the movement of each bee by adjusting its individual Sine behavior properties; explore additional properties to discover what they do! |
| ❑ | Create Particles | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "**Particles**" > Name: "**Particles**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **particle-star-20x21.png**<br>■ Click X to close; Particles object should be on "Game" layer<br>■ Drag the Particles **object outside of the layout** into margin |
| ❑ | Set Particles Properties | ■ Select "**Particles**" > Set/confirm the following properties:<br>○ Properties<br>■ **Rate**: 150<br>■ **Spray Cone**: 360<br>■ **Type**: One-shot<br>○ Initial particle properties<br>■ **Speed**: 180<br>■ **Size**: 48 |

| | | |
|---|---|---|
| | | ■ **Grow rate**: -25<br>■ **X randomiser**: 5<br>■ **Y randomiser**: 5<br>○ Particle lifetime properties<br>■ **Gravity**: 75<br>■ **Timeout**: 1.5 |
| ❑ | Create "Particles" Image Point on Player | ■ Select "**Player**" > Select "Edit animations"<br>■ Select "Edit the image points" option<br>○ Under "Image Points" > Right-click "**Add a new image point**"<br>■ Set **X** to **43**<br>■ Set **Y** to **59**<br>○ Rename to "**Particles**"<br>■ Click X to close |
| ❑ | Create "On Player Collision with Enemies" Event and Actions to Destroy Player and End Game | ■ Right-click "Start & End Level Event Sheet" > Select "Open"<br>■ Click "**Add event to 'End of Level'**"<br>○ Double-click "**Player**"<br>○ Double-click "**On collision with another object**" (under "Collisions")<br>■ **Object**: Enemies<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Destroy**" (under "Misc")<br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Spawn another object**" (under "Misc")<br>■ **Object**: Particles<br>■ **Layer**: Player.LayerName<br>■ **Image point**: "Particles"<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Destroy**" (under "Misc")<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Wait**" (under "Time")<br>■ **Seconds**: 3.0<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Restart layout**" (under "Layout")<br>■ Drag event to very top of the "**End of Level**" event group |

| | | |
|---|---|---|
| ❑ | Bring Alien to Top of Layer (Z Order) | ■ Make sure "Game" layer is active and unlocked<br>■ VIEW > BARS > Z-ORDER BAR (if bar is not visible)<br>■ Drag "Alien" to top of "Game" layer |
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

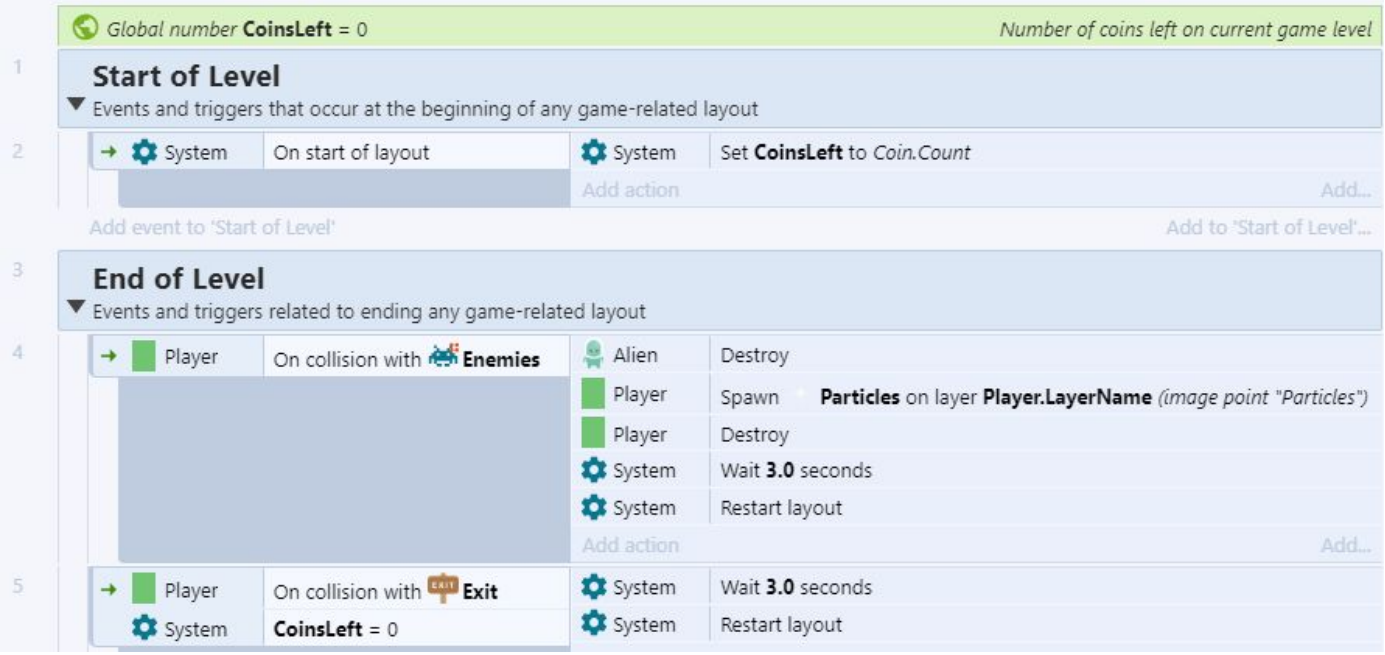



**FIGURE 9**: Snapshot of "Start & End Level Event Sheet" (after Barnacles & Bees)

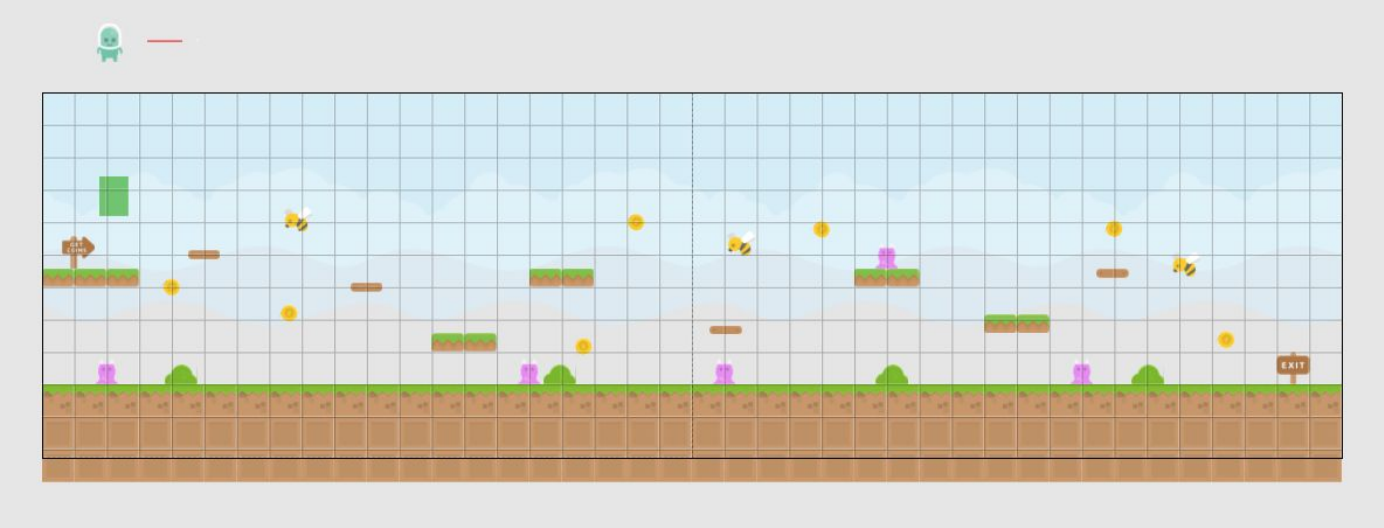


**FIGURE 10**: Snapshot of "Level 1" Layout (after Barnacles & Bees)

## The Castle

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Castle Object Types | Create Sprite object types for the castle **using information from the table** below. Remember, to place each object type on its correct layer and to add object types that belong to the "Solids" family. |

| Name | File | Origin (X, Y) | Layer | Solids Family |
|---|---|---|---|---|
| **Stone** | stone-96x96.png | 0, 0 | **Background** | NO |
| **StoneLeft** | stone-left-96x96.png | 0, 0 | **Background** | NO |
| **StoneRight** | stone-right-96x96.png | 0, 0 | **Background** | NO |
| **CastleFlag** | castle-flag-96x96.png | 0, 0 | **Background** | NO |
| **CastleWindow** | castle-window-96x192.png | 0, 0 | **Background** | NO |
| **Spire** | spire-160x160.png | **80, 160** | **Background** | NO |
| **StoneTop** | stone-top-96x96.png | 0, 0 | **Game** | **YES** |
| **StoneTopLeft** | stone-top-left-96x96.png | 0, 0 | **Game** | **YES** |
| **StoneTopMiddle** | stone-top-middle-96x44.png | **0, 44** | **Game** | **YES** |
| **StoneTopRight** | stone-top-right-96x96.png | 0, 0 | **Game** | **YES** |

| | | |
|---|---|---|
| ❑ | Create Castle | Duplicate and arrange objects until you have created a castle (minus the door and spire flags) **referring to the figures below**.<br><br>**Note**: Move objects up and down, as needed, using the Z-Order Bar, e.g., place all castle-related objects below the bushes; place the alien behind the stones atop the castle. |

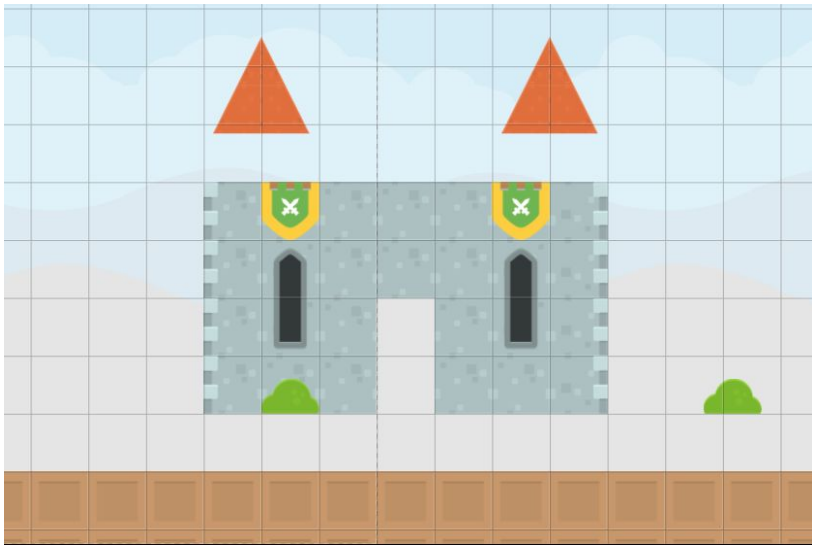


**FIGURE 11**: Snapshot of Castle ("Background" layer only)

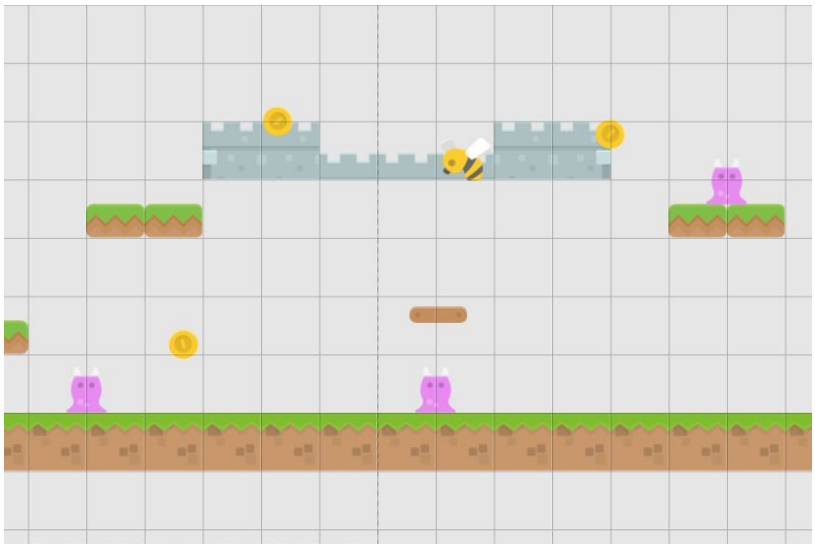


**FIGURE 12**: Snapshot of Castle ("Game" layer only)

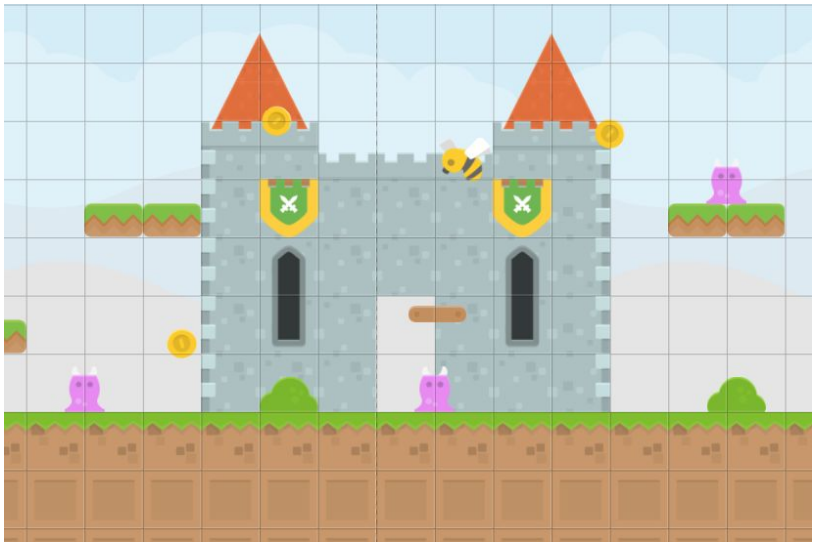
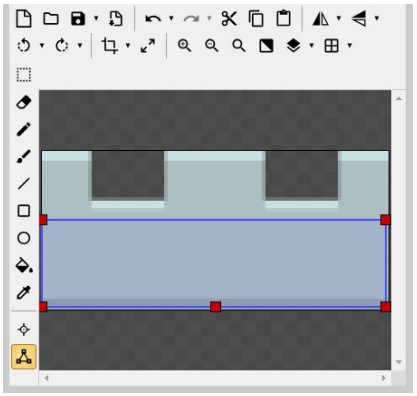
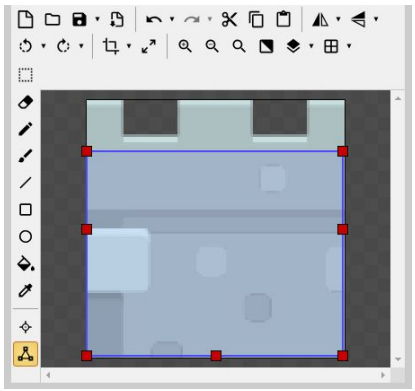
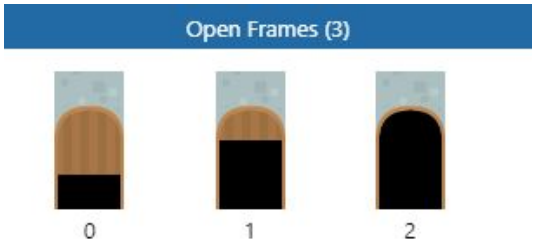
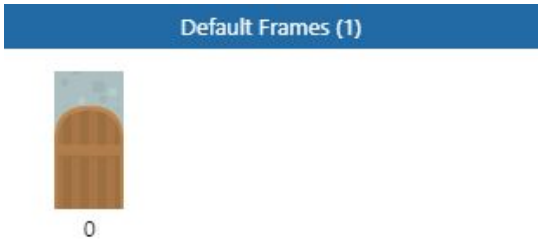


**FIGURE 13**: Snapshot of Castle (All layers)

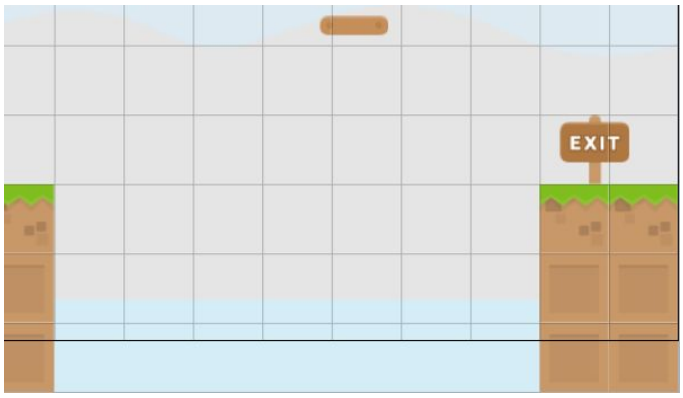
| | | |
|---|---|---|
| ❑ | Adjust Collision Polygons of Castle Top Stones | ■ Adjust the collision polygons of the following object types, to resemble the figures below, using the "Edit the collision polygon" option:<br>○ **StoneTopLeft**<br>○ **StoneTop**<br>○ **StoneTopMiddle**<br>○ **StoneTopRight**<br>   <br>**Note**: This step is necessary to make the player appear to walk on the castle's roof, instead of simply on top of it. |
| ❑ | Create Castle Door | ■ Make sure "Background" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**CastleDoor**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Within "Frames" > Right-click "**Import Frames**" > "**From Strip**"<br>■ Click folder icon > Browse to and OPEN: **castle-door-4x1-96x192.png**<br>■ When Import Sprite Strip dialog appears:<br>○ Number of horizontal cells: **4**<br>○ Number of vertical cells: **1**<br>○ Direction**: Horizontal**<br>○ Check "**Replace entire animation**"<br>○ Select IMPORT<br>■ Select "Edit the collision polygon" option<br>○ Right-click "**Guess the polygon shape**"<br>○ Right-click "**Apply to whole animation**"<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **192**<br>○ Right-click "**Apply to whole animation**" |

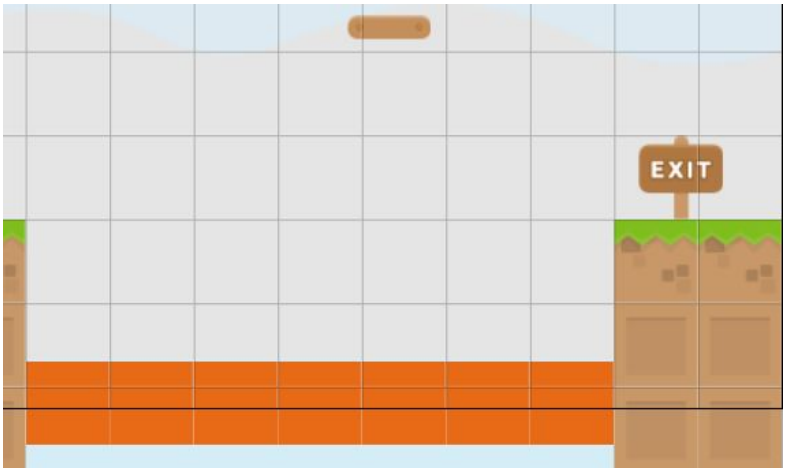
| | | |
|---|---|---|
| | | ■ Click X to close; CastleDoor object should be on "Background" layer; position as appropriate |
| ❑ | Rename Default Animation | ■ Right-click "**CastleDoor**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Animation 1**" > Rename to "**Default**" |
| ❑ | Create "Open" Animation | ■ Right-click "**CastleDoor**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Default**" > Select "Duplicate"<br>■ Rename new animation to "**Open**"<br>■ Within "Frames", rearrange/duplicate/delete frames until it resembles the following **three-frame** animation:<br>  <br>■ Click X to close |
| ❑ | Set "Open" Animation Properties | ■ Right-click "**CastleDoor**" > Select "Edit animations" > Select "**Open**":<br>○ Animation Properties<br>■ **Speed**: 3<br>■ Uncheck "**Loop**"<br>■ Click X to close |
| ❑ | Create "Close" Animation | ■ Right-click "**CastleDoor**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Default**" > Select "Duplicate"<br>■ Rename new animation to "**Close**"<br>■ Within "Frames", rearrange/duplicate/delete frames until it resembles the following **four-frame** animation:<br> <br>■ Click X to close |

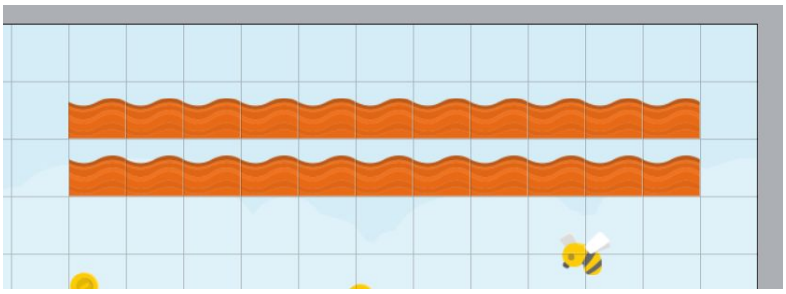
| | | |
|---|---|---|
| ❑ | Set "Close" Animation Properties | ■ Right-click "**CastleDoor**" > Select "Edit animations" > Select "**Close**":<br>○ Animation Properties<br>■ **Speed**: 3<br>■ Uncheck "**Loop**"<br>■ Click X to close |
| ❑ | Modify "Default" Animation | ■ Right-click "**CastleDoor**" > Select "Edit animations" > Select "**Default**" animation<br>■ Within "Frames", rearrange/duplicate/delete frames until it resembles the following **single-frame** animation:<br>  <br>■ Click X to close |
| ❑ | Create Green Flags for Castle Spires | ■ Make sure "Background" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**FlagGreen**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Within "Frames" > Right-click "**Import Frames**" > "**From Strip**"<br>■ Click folder icon > Browse to and OPEN: **flag-green-2x1-65x70.png**<br>■ When Import Sprite Strip dialog appears:<br>○ Number of horizontal cells: **2**<br>○ Number of vertical cells: **1**<br>○ Direction**: Horizontal**<br>○ Check "**Replace entire animation**"<br>○ Select IMPORT<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **70**<br>○ Right-click "**Apply to whole animation**"<br>■ Click X to close; FlagGreen object should be on "Background" layer; position as appropriate |

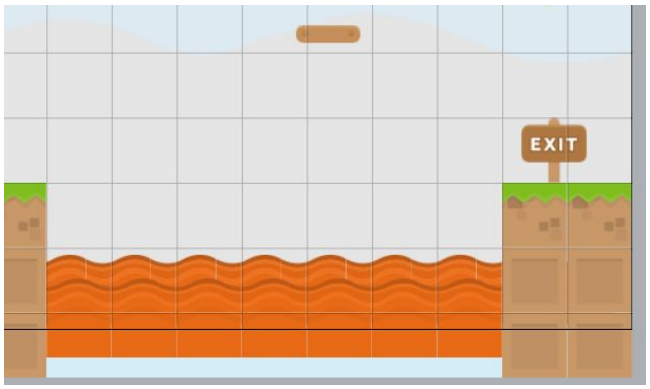
| | | |
|---|---|---|
| | | **Note**: Move objects up and down, as needed, using the Z order bar, e.g., place flags behind the castle's spires. |
| ❑ | Rename Default Animation | ■ Right-click "**FlagGreen**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Animation 1**" > Rename to "**Wave**" |
| ❑ | Set "Wave" Animation Properties | ■ Right-click "**FlagGreen**" > Select "Edit animations" > Select "**Wave**":<br>○ Animation Properties<br>■ **Speed**: 1.5<br>■ Check "**Loop**"<br>■ Click X to close |
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## The Moat

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Prepare Layout for Castle Moat | ■ Make sure "Game" and "Background" layers are unlocked<br>■ Move or delete objects necessary to clear the way for a **7-tile-wide moat**; your layout should resemble:<br>  |
| ❑ | Create Lava | ■ Make sure "Background" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Lava**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Select "Resize" option:<br>○ Image Canvas Size<br>■ **Width** (pixels): 96 |

| | | |
|---|---|---|
| | | ■ **Height** (pixels): 96<br>○ Select OK<br><br>■ Select "Fill" option:<br>○ Enter Custom Color (in color palette)<br>■ **Red**: 232<br>■ **Green**: 106<br>■ **Blue**: 23<br>■ **Alpha**: 255<br>○ Click on canvas to fill object<br><br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0**<br>■ Set **Y** to **0**<br><br>■ Click X to close; Lava object should be on "Background" layer |
| ❑ | Duplicate Lava | Create a **7 x 1** (Width x Height) section of Lava objects using **Ctrl + drag** (left mouse button) at the bottom of the moat using a combination of snap-to-grid and manual movements:<br><br>  <br> |
| ❑ | Create Top of Lava | ■ Make sure "Background" layer is active and unlocked<br><br>■ Right-click OBJECT TYPES > Select "Add new object type"<br><br>■ Select "Sprite" > Name: "**LavaTop**" > INSERT<br><br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br><br>■ Click folder icon > Browse to and OPEN: **lava-top-96x68.png**<br><br>■ Select "Edit the collision polygon" option<br><br>■ Right-click "**Guess the polygon shape**"<br><br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **0** |

| | | |
|---|---|---|
| | | ■ Set **Y** to **68**<br>■ Click X to close; Lava object should be on "Background" layer |
| ❑ | Assign Lava Top to "Enemies" Family | ■ Select "**Enemies**" Family > Right-click "Edit family"<br>○ Click "**LavaTop**"<br>○ Click "Add" to place in family > OK |
| ❑ | Assign Horizontal Sine Behavior to Top of Lava | ■ Right-click "**LavaTop**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Sine**" under "Movements" > ADD<br>○ Rename "**LavaSideToSide**"<br>○ Click X to close |
| ❑ | Assign Vertical Sine Behavior to Lava Top | ■ Right-click "**LavaTop**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Sine**" under "Movements" > ADD<br>○ Rename "**LavaUpDown**"<br>○ Click X to close |
| ❑ | Set Lava Top Properties | ■ Select "**LavaTop**" > Set/confirm the following properties:<br>○ Behaviors (LavaSideToSide)<br>■ **Movement**: Horizontal<br>■ **Period**: 8<br>■ **Magnitude**: 45<br>■ Check "**Preview**" (optional)<br>○ Behaviors (LavaUpDown)<br>■ **Movement**: Vertical<br>■ **Period**: 8<br>■ **Magnitude**: 15<br>■ Check "**Preview**" (optional) |
| ❑ | Duplicate Lava Top | Create **two separate 11 x 1** (Width x Height) **sections of Lava Top objects** using Ctrl + drag (left mouse button) and the snap-to-grid feature. For now, **place these above the moat where you can easily work with them**.<br>  <br>**Note:** To select multiple objects you can highlight them using your mouse or **Shift + Click** (left mouse button). |
| ❑ | Modify Properties of One Strip of Lava Top | ■ Select one of the two "**LavaTop**" strips you created by highlighting or **Shift + Click** > Set the following properties:<br>○ Behaviors (LavaSideToSide) |

| | | |
|---|---|---|
| | | ■ **Period**: 12<br>■ **Magnitude**: 24<br>○ Behaviors (LavaUpDown)<br>■ **Period**: 8<br>■ **Magnitude**: 12 |
| ❑ | Position and Order Lava Top Strips | ■ Carefully select the 11 x 1 strips of "**LavaTop**" objects, one strip at a time, positioning them in the moat<br>■ Using the Z Order Bar, place Lava and LavaTop objects **beneath the Ground objects** and Lava **beneath the LavaTop**:<br> <br>■ When completed, your moat should resemble the following:<br>  |
| ❑ | Preview Layout | From "Level 1" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## Tracking the Player

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Add Instance Variable to the Player | ■ Right-click "**Player**" > Select "Edit instance variables"<br>○ Click "**Add new instance variable**"<br>■ **Name**: active<br>■ **Type**: Boolean<br>■ Uncheck "**Initial value**"<br>■ **Description**: Whether player is active<br>■ Select OK<br>■ Click X to close |
| ❑ | Add Action to Activate Player at Start of Each Level | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br>■ Under the "**On start of layout**" event within the "**Start of Level**" event group click "**Add action**":<br>○ Double-click "**Player**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: active<br>■ **Value**: True<br>○ Select DONE |
| | | |
| ❑ | Add "Deactivate Player" Action to "Success" Event | ■ Under the "Success" event (collision with Exit & CoinsLeft = 0) within the "**End of Level**" event group, click "**Add action**":<br>○ Double-click "**Player**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: active<br>■ **Value**: False<br>○ Select DONE<br>■ Drag action up so that it is **listed first** for the event |
| | | |
| ❑ | Modify "Movement" Event Group to Restrict Player Movement (if inactive) | ■ Right-click "Player Event Sheet" > Select "Open"<br>■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Player**"<br>○ Double-click "**Is boolean instance variable set**" (under "Instance variables") |

| | | |
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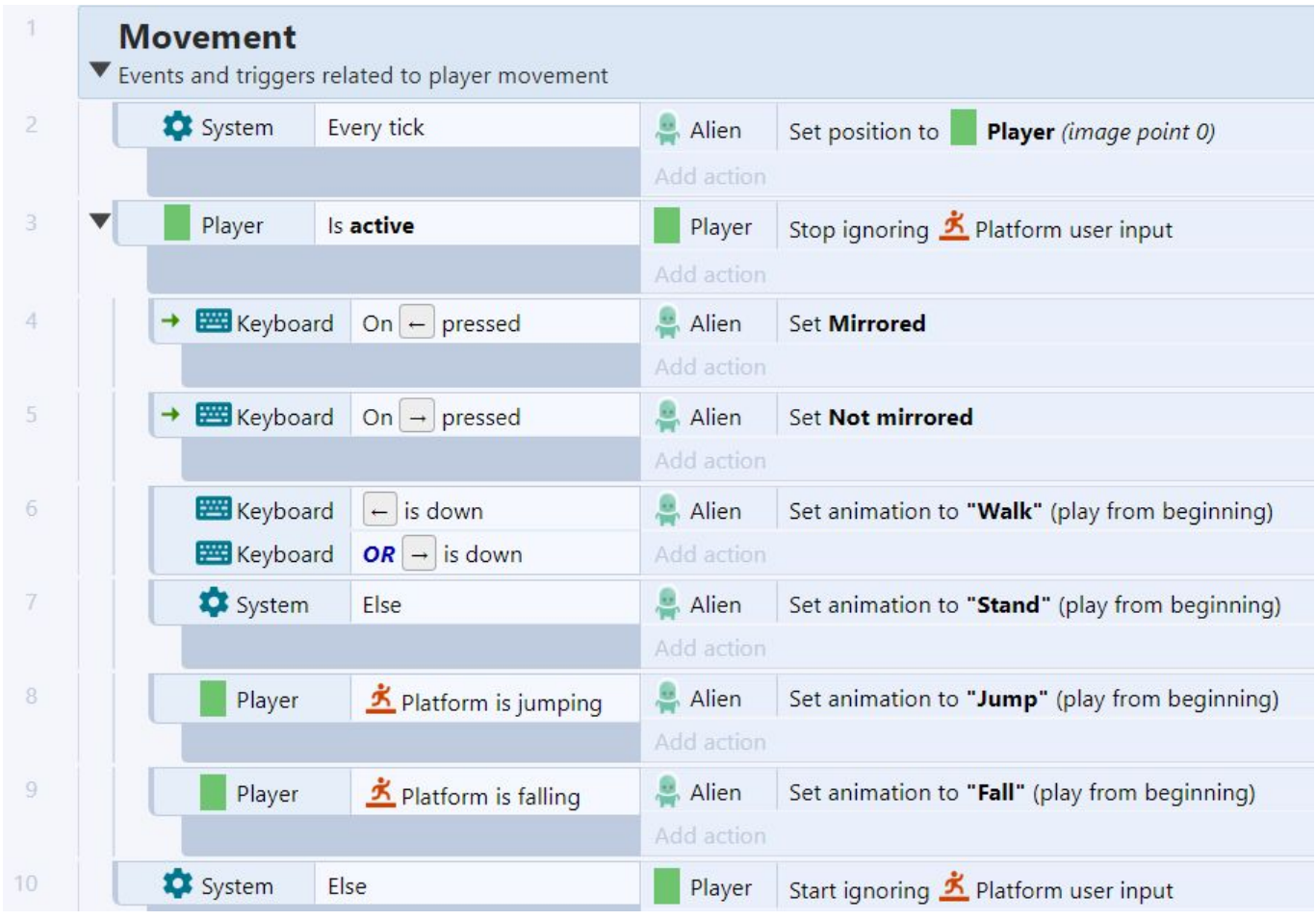
| | | ■ **Instance variable**: active<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set ignoring input**" (under "Platform")<br>■ **Input**: Stop ignoring<br>○ Select DONE<br><br>■ Right-click event > Select "**Add**" > Select "**Add 'Else'**"<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set ignoring input**" (under "Platform")<br>■ **Input**: Start Ignoring<br>○ Select DONE<br><br>■ Drag newly-created events near the top of the event group, placing **immediately beneath the positioning event**<br><br>■ Drag previous events—minus the positioning event—within the **'Player is active'** block, making them **sub-events** |
| | |  |
| ❑ | Debug Layout | From "Level 1" layout > Click "Debug layout" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## Raising the Gate

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Assign Fade (Out) Behavior to Alien | ■ Right-click "**Alien**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Fade**" under "General" > ADD<br>○ Rename "**FadeOut**"<br>○ Click X to close |
| ❑ | Assign Fade (In) Behavior to Alien | ■ Right-click "**Alien**" > Select "Edit behaviors"<br>■ Click "**Add new behavior**":<br>○ Select "**Fade**" under "General" > ADD<br>○ Rename "**FadeIn**"<br>○ Click X to close |
| ❑ | Set Alien Fade Properties | ■ Select "**Alien**" > Set/confirm the following properties:<br>○ Behaviors (FadeOut)<br>■ **Fade in time**: 0<br>■ **Wait time**: 0.5<br>■ **Fade out time**: 1<br>■ Uncheck **Destroy**<br>■ Uncheck **Enabled**<br>○ Behaviors (FadeIn)<br>■ **Fade in time**: 1.5<br>■ **Wait time**: 0.5<br>■ **Fade out time**: 0<br>■ Uncheck **Destroy**<br>■ Uncheck **Enabled** |
| ❑ | Add Instance Variable to Castle Door | ■ Select "**CastleDoor**" > Select "Edit instance variables"<br>○ Click "**Add new instance variable**"<br>■ **Name**: open<br>■ **Type**: Boolean<br>■ Uncheck **Initial Value**<br>■ **Description**: Whether door is open<br>■ Select OK<br>■ Click X to close |
| ❑ | Annotate Unique ID (UID) of Grass Object in Front of Castle Door | ■ Make sure "Game" layer is active and unlocked<br>■ Click on Grass object in front of the CastleDoor object |

| | | |
|---|---|---|
| | | ■ Annotate its UID from the Properties Bar (example below):<br> |
| ❑ | Create "Castle Door" Event Group | ■ Right-click "**Level 1 Event Sheet**" > Select "Open"<br>■ Right-click > "**Add group**"<br>○ **Name**: Castle Door<br>○ **Description**: Events and triggers that control interactions with the castle door<br>○ Select OK |
| ❑ | Create Open Castle Door Event | ■ Click "**Add event to 'Castle Door'**"<br>○ Double-click "**Player**"<br>○ Double-click "**On collision with another object**" (under "Collisions")<br>■ **Object**: Grass<br>○ Select DONE<br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Grass**"<br>○ Double-click "**Pick by unique ID**" (under "Misc")<br>■ **Unique ID**: <UID you annotated previously><br>○ Select DONE<br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**Is boolean instance variable set**" (under "Instance variables")<br>■ **Instance variable**: open<br>○ Select DONE<br>○ Right-click newly-created condition > Select "**Invert**"<br>■ Click "**Add action**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: open<br>■ **Value**: True<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: active<br>■ **Value**: False |

| | | |
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| | | ○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Stand"<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Open"<br>○ Select DONE |
| ❑ | Create Castle Door Open Animation Finished Event | ■ Click "**Add event to 'Castle Door'**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**On finished**" (under "Animations")<br>■ **Animation**: "Open"<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set position**" (under "Size & Position")<br>■ **X**: CastleDoor.X+(CastleDoor.Width/2)<br>■ **Y**: CastleDoor.Y<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set enabled**" (under "ScrollTo")<br>■ **State**: disabled<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Restart Fade**" (under "FadeOut")<br>○ Select DONE |
| ❑ | Create Alien Fade Out Finished Event | ■ Click "**Add event to 'Castle Door'**"<br>○ Double-click "**Alien**"<br>○ Double-click "**On fade-out finished**" (under "FadeOut")<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set position**" (under "Size & Position")<br>■ **X**: Player.X<br>■ **Y**: 0<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set enabled**" (under "ScrollTo") |

| | | |
|---|---|---|
| | | ■ **State**: enabled<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Alien**"<br>○ Double-click "**Restart Fade**" (under "FadeIn")<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: active<br>■ **Value**: True<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Close"<br>○ Select DONE |
| ❑ | Create Castle Door Close Animation Finished Event | ■ Click "**Add event to 'Castle Door'**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**On finished**" (under "Animations")<br>■ **Animation**: "Close"<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**CastleDoor**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: open<br>■ **Value**: False<br>○ Select DONE |
| ❑ | Add Additional Coin and Enemy Objects to Layout | Add additional instances of the Coin, Barnacle, and Bee objects, as desired, around the top of the castle so that the player has to raise the gate to complete the level |
| ❑ | Debug Layout | From "Level 1" layout > Click "Debug layout" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 🖫 |

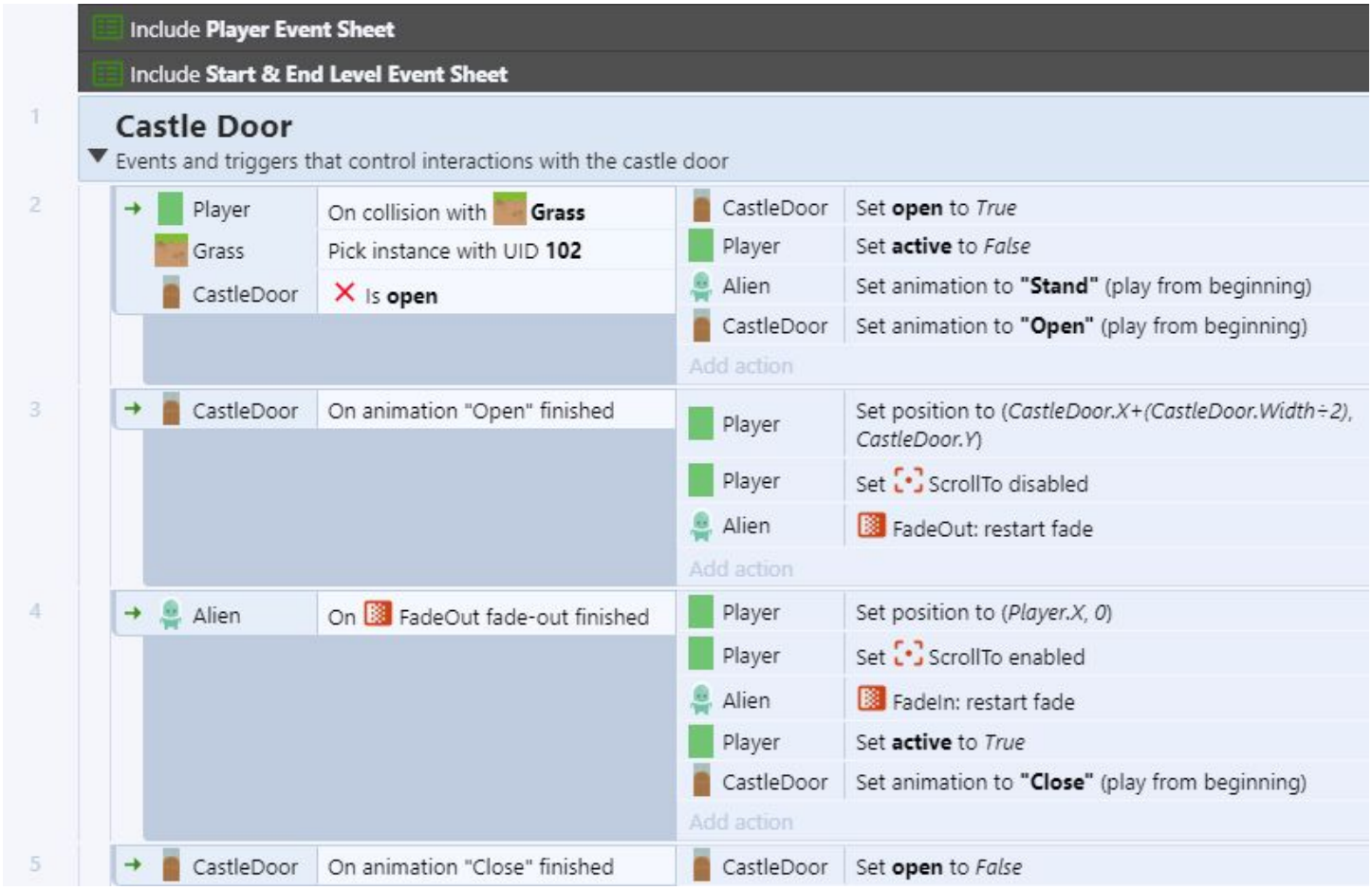


**FIGURE 14**: Snapshot of "Level 1 Event Sheet" (after Raising the Gate)

## Crossing the Moat

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create Lever | ■ Make sure "Game" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**Lever**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Within "Frames" > Right-click "**Import Frames**" > "**From Strip**"<br>■ Click folder icon > Browse to and OPEN: **lever-3x1-71x65.png**<br>■ When Import Sprite Strip dialog appears:<br>○ Number of horizontal cells: **3**<br>○ Number of vertical cells: **1**<br>○ Direction: **Horizontal**<br>○ Check "**Replace entire animation**" |

| | | |
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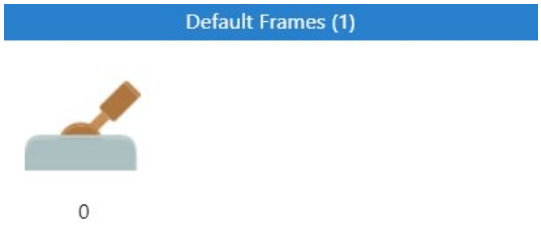
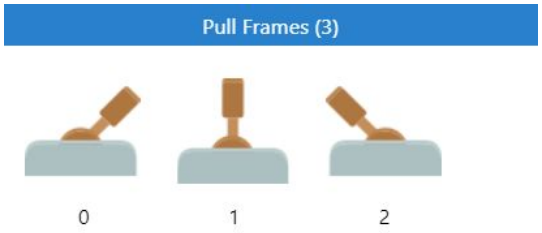
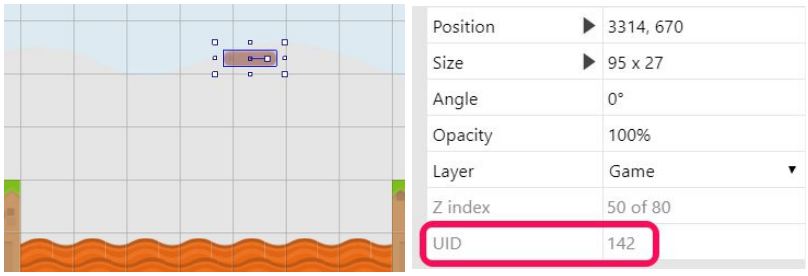
| | | ○ Select IMPORT<br>■ Within "Frames", rearrange/duplicate/delete frames until it resembles the following **single-frame** animation:<br>  <br>■ Select "Edit the collision polygon" option<br>■ Right-click "**Guess the polygon shape**"<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **35**<br>■ Set **Y** to **60**<br>■ Click X to close; Lever object should be on "Game" layer; position strategically before the moat |
| ❑ | Rename Default Animation | ■ Right-click "**Lever**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Animation 1**" > Rename to "**Default**" |
| ❑ | Create "Pull" Animation | ■ Right-click "**Lever**" > Select "Edit animations"<br>■ Under "Animations" > Right-click "**Add Animation**"<br>■ Rename new animation to "**Pull**"<br>■ Within "Frames" > Right-click "**Import Frames**" > "**From Strip**"<br>■ Click folder icon > Browse to and OPEN: **lever-3x1-71x65.png**<br>■ When Import Sprite Strip dialog appears:<br>○ Number of horizontal cells: **3**<br>○ Number of vertical cells: **1**<br>○ Direction: **Horizontal**<br>○ Check "**Replace entire animation**"<br>○ Select IMPORT |

<table>
<tr>
<td></td>
<td></td>
<td>
<ul>
<li>Verify that your three-frame animation resembles the following:</li>
</ul>


<ul>
<li>Select "Edit the image points" option; change existing "Origin" image points:</li>
</ul>
<table>
<tr><th>Frame #</th><th>Origin (X, Y)</th></tr>
<tr><td>Frame 0</td><td>35, 60</td></tr>
<tr><td>Frame 1</td><td>36, 65</td></tr>
<tr><td>Frame 2</td><td>38, 60</td></tr>
</table>
<ul>
<li>Click X to close</li>
</ul>
</td>
</tr>
<tr>
<td>❑</td>
<td>Set "Pull" Animation Properties</td>
<td>
<ul>
<li>Right-click "Lever" > Select "Edit animations" > Select "Pull":
<ul>
<li>Animation Properties
<ul>
<li>Speed: 3</li>
<li>Uncheck "Loop"</li>
</ul>
</li>
</ul>
</li>
<li>Click X to close</li>
</ul>
</td>
</tr>
<tr>
<td>❑</td>
<td>Add Instance Variable to Lever</td>
<td>
<ul>
<li>Right-click "Lever" > Select "Edit instance variables"
<ul>
<li>Click "Add new instance variable"
<ul>
<li>Name: pulled</li>
<li>Type: Boolean</li>
<li>Uncheck "Initial Value"</li>
<li>Description: Whether lever has been pulled</li>
<li>Select OK</li>
</ul>
</li>
</ul>
</li>
<li>Click X to close</li>
</ul>
</td>
</tr>
<tr>
<td>❑</td>
<td>Annotate Unique ID (UID) of Bridge Above the Moat</td>
<td>
<ul>
<li>Make sure "Game" layer is active and unlocked</li>
<li>Click on Bridge object above the moat</li>
</ul>
</td>
</tr>
</table>

| | | |
|---|---|---|
| | | ■ Annotate its UID from the Properties Bar (example below):<br>  |
| ❑ | Create "Start of Level 1" Event Group | ■ Right-click "**Level 1 Event Sheet**" > Select "Open"<br>■ Right-click > "**Add group**"<br>○ **Name**: Start of Level 1<br>○ **Description**: Events and triggers that occur at the beginning of the Level 1 layout only<br>○ Select OK<br>■ **Drag event group to top** of event sheet |
| ❑ | Create "On Start of Layout" Event to Disable Floating Bridge Above Moat | ■ Click "**Add event to 'Start of Level 1'**"<br>○ Double-click "**System**"<br>○ Double-click "**On start of layout**" (under "Start & end")<br>■ Right-click newly-created event > Select "**Add**" > Select "**Add sub-event**"<br>○ Double-click "**Bridge**"<br>○ Double-click "**Pick by unique ID**" (under "Misc")<br>■ **Unique ID**: <UID you annotated previously><br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**Bridge**"<br>○ Double-click "**Set enabled**" (under "BridgeSideToSide")<br>■ **State**: Disabled<br>○ Select DONE |
| ❑ | Create "Lever" Event Group | ■ Right-click > "**Add group**"<br>○ **Name**: Lever<br>○ **Description**: Events and triggers that control the lever and access to the final floating bridge<br>○ Select OK |
| ❑ | Create "Player Collision with Lever" Event | ■ Click "**Add event to 'Lever'**"<br>○ Double-click "**Player**"<br>○ Double-click "**On collision with another object**" (under "Collisions")<br>■ **Object**: Lever<br>○ Select DONE<br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Lever**" |

| | | |
|---|---|---|
| | | ○ Double-click "**Is boolean instance variable set**" (under "Instance variables")<br>■ **Variable**: pulled<br>○ Select DONE<br>○ Right-click newly-created condition > Select "**Invert**"<br><br>■ Click "**Add action**"<br>○ Double-click "**Lever**"<br>○ Double-click "**Set boolean**" (under "Instance variables")<br>■ **Instance variable**: pulled<br>■ **Value**: True<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Lever**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Pull"<br>○ Select DONE |
| ❑ | Create Lever Pull Animation Finished Event | ■ Click "**Add event to 'Lever'**"<br>○ Double-click "**Lever**"<br>○ Double-click "**On finished**" (under "Animations")<br>■ **Animation**: "Pull"<br>○ Select DONE<br><br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Bridge**"<br>○ Double-click "**Pick by unique ID**" (under "Misc")<br>■ **Unique ID**: <UID you annotated previously><br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Bridge**"<br>○ Double-click "**Set enabled**" (under "BridgeSideToSide")<br>■ **State**: Enabled<br>○ Select DONE |
| ❑ | Debug Layout | From "Level 1" layout > Click "Debug layout" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 🖫 |

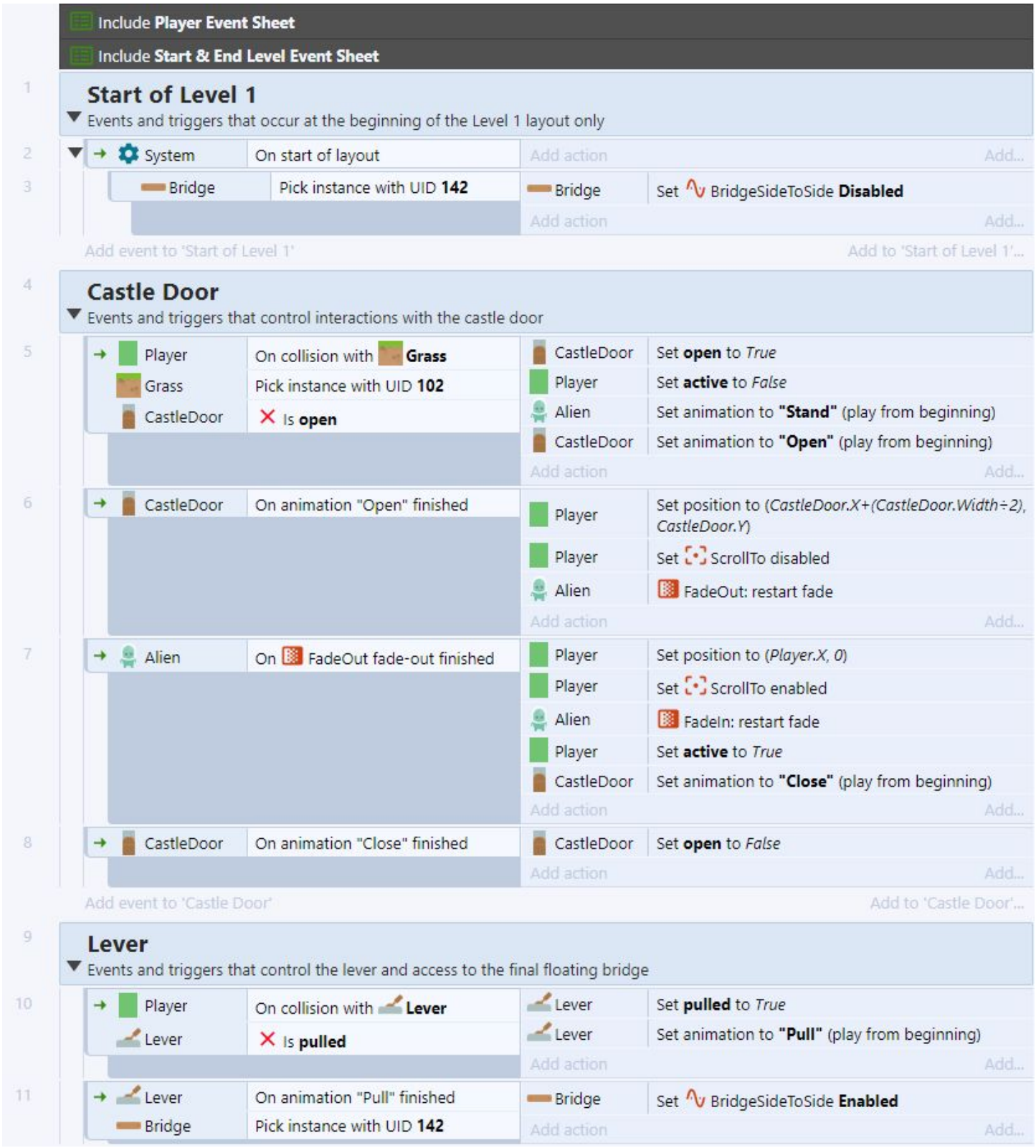


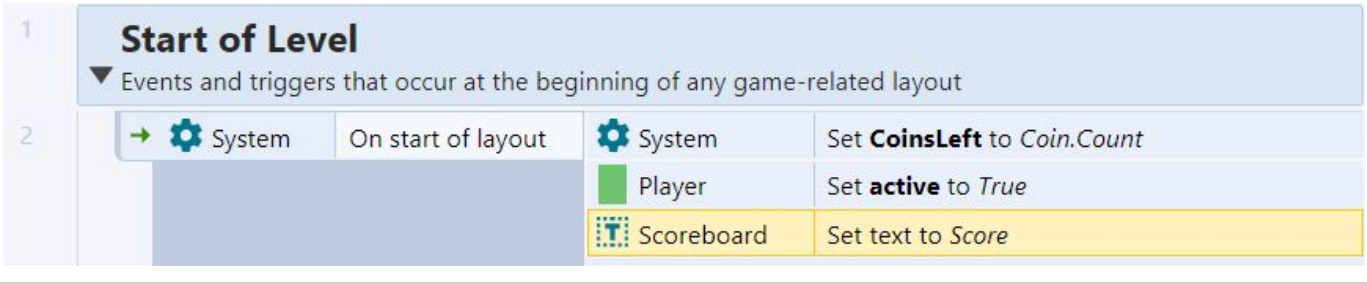

**FIGURE 15**: Snapshot of "Level 1 Event Sheet" (after Crossing the Moat)

## Keeping Score

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Add "Almendra Bold" Web Font to Project | ■ Right-click FONTS > Select "Import files"<br>■ Browse to and IMPORT **almendra-bold.woff2** |
| ❑ | Lock "Background" and "Game" Layers | ■ Select "Background" layer > Click lock icon<br>■ Select "Game" layer > Click lock icon |
| ❑ | Create "HUD" Layer | ■ Under "Layers" > Right-click "**Add layer at top**" > Rename new layer to "**HUD**"<br>■ Make sure the "HUD" layer is active, unlocked, and listed **above** the "Game" layer |
| ❑ | Set "HUD" Layer Properties | ■ Select "HUD" layer > Set the following properties:<br>○ Scroll & zoom<br>■ **Parallax** (X x Y): 0% x 0%<br>○ Appearance<br>■ **Opacity**: 80% |
| ❑ | Create Scoreboard | ■ Make sure "HUD" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "**Text**" > Name: "**Scoreboard**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout; Scoreboard object should be on "HUD" layer |
| ❑ | Set Scoreboard Properties | ■ Select "**Scoreboard**" > Set/confirm the following properties:<br>○ Common<br>■ **Position**: 1620, 0<br>■ **Size** (Width x Height): 250 x 100<br>○ Properties<br>■ **Text**: <empty><br>■ **Font**: almendra-bold<br>■ **Size**: 72<br>■ **Color**: 51 (Red), 56 (Green), 57 (Blue)<br>■ **Horizontal alignment**: Right |
| ❑ | Create Global Variable to Track Score | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br>■ Right-click "**Add global variable**"<br>○ **Name**: Score<br>○ **Type**: Number<br>○ **Initial value**: 0<br>○ **Description**: Current score of the game<br>○ Select OK |

*Global number* **Score** = 0 *Current score of the game*

| | | |
|---|---|---|
| ❑ | Add Action to Set Scoreboard Text at Start of Level | ■ Under the "**On start of layout**" event within the "**Start of Level**" event group, click "**Add action**":<br>○ Double-click "**Scoreboard**"<br>○ Double-click "**Set text**" (under "Text")<br>■ **Text**: Score<br>○ Select DONE |

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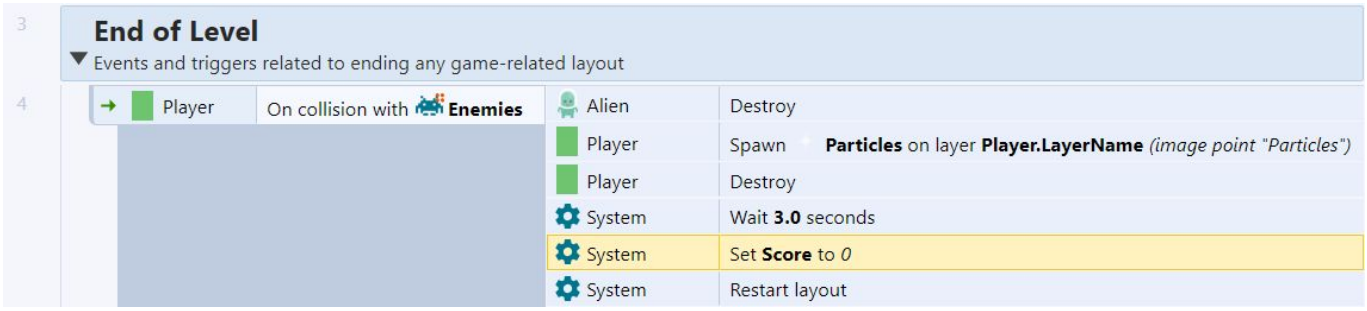
| ❑ | Add Action "On Player Collision with Enemies" Event to Reset Score | ■ Under the "**On collision with Enemies**" event within the "**End of Level**" event group, click "**Add action**":<br>○ Double-click "**System**"<br>○ Double-click "**Set value**" (under "Global & local variables")<br>■ **Variable**: Score<br>■ **Value**: 0<br>○ Select DONE<br><br>■ Drag action up so that it is the second-to-last action |

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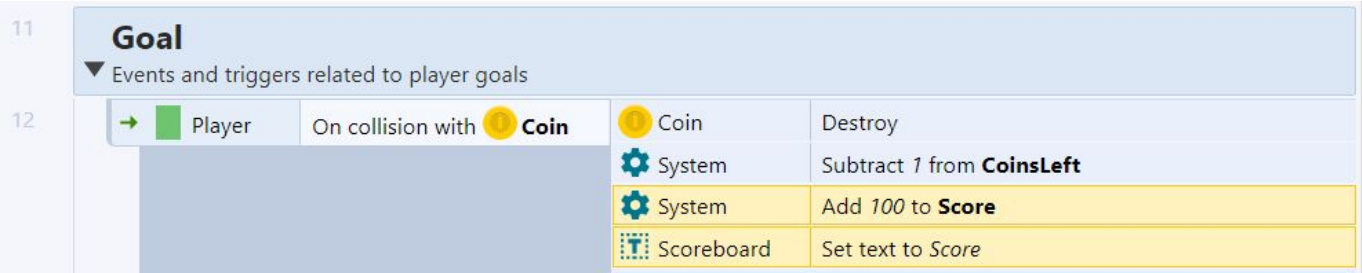
|---|---|---|
| ❑ | Add Actions to Increment Score and Update Scoreboard as Coins Are Collected | ■ Right-click "**Player Event Sheet**" > Select "Open"<br><br>■ Under the "**On collision with Coin**" event within the "**Goal**" event group, click "**Add action**":<br>○ Double-click "**System**"<br>○ Double-click "**Add to**" (under "Global & local variables")<br>■ **Variable**: Score<br>■ **Value**: 100<br>○ Select DONE<br><br>■ Under the "**On collision with Coin**" event within the "**Goal**" event group, click "**Add action**":<br>○ Double-click "**Scoreboard**"<br>○ Double-click "**Set text**" (under "Text")<br>■ **Text**: Score<br>○ Select DONE |




| | | |
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| ❑ | Lock "HUD" Layer | Select "HUD" layer > Click lock icon |
| ❑ | Debug Layout | From "Level 1" layout > Click "Debug layout" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 💾 |

## You Win!

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Create "Game Over" Layout | Right-click LAYOUTS > Select "**Add layout**" > Select "**Add event sheet**" option |
| ❑ | Rename Layout | Right-click "Layout 1" > Rename to "**Game Over**" |
| ❑ | Rename Event Sheet | Right-click "Event sheet 1" > Rename to "**Game Over Event Sheet**" |
| ❑ | Set Layout Properties | ■ Select "Game Over" > Set the following properties:<br>○ Layout<br>■ **Size** (Width x Height): 1920 x 1080<br>○ Editor<br>■ **Margins** (Width x Height): 500 x 500 |
| ❑ | Rename "Layer 0" | Right-click "Layer 0" > Rename to "**Background**" |
| ❑ | Create "You Win" Background | ■ Make sure "Background" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**YouWin**" > INSERT<br>■ When crosshair appears, click inside "Game Over" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **you-win-1920x1080.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **960**<br>■ Set **Y** to **540**<br>■ Click X to close; YouWin object should be on "Background" layer |

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| ❑ | Position "You Win" Background | ■ Right-click "YouWin" object on "Game Over" layout > "Align" > Layout > **Center horizontal**<br>■ Right-click "YouWin" object on "Game Over" layout > "Align" > Layout > **Center vertical** |
| ❑ | Lock "Background" Layer | Select "Background" layer > Click lock icon |
| ❑ | Create "Content" Layer | ■ Under "Layers" > Right-click "**Add layer at top**" > Rename new layer to "**Content**"<br>■ Make sure the "Content" layer is active, unlocked, and listed **above** the "Background" layer |
| ❑ | Add Scoreboard to "Game Over" Layout | ■ Drag a Scoreboard object onto the "**Game Over**" layout; it should be assigned to the "**Content**" layer |
| ❑ | Set Scoreboard Properties | ■ Right-click "**Scoreboard**" object on "Game Over" layout > Set/confirm the following properties:<br>○ Common<br>■ **Position**: 1090, 610<br>■ **Size** (Width x Height): 800 x 300<br>○ Properties<br>■ **Size**: 144<br>■ **Horizontal alignment**: Left |
| ❑ | Include "Start & End Level Event Sheet" in "Game Over Event Sheet" | ■ Right-click "**Game Over Event Sheet**" > Select "Open"<br>■ Right-click > "**Include event sheet**" > Double-click "**Start & End Level Event Sheet**" |
| ❑ | Create "Game Over" Event Group | ■ Right-click > "**Add group**"<br>○ **Name**: Game Over<br>○ **Description**: Events and triggers that occur on Game Over layout only<br>○ Select OK |
| ❑ | Add "Press Anything to Play Again" Event | ■ Click "**Add event to 'Game Over'**"<br>○ Double-click "**Keyboard**"<br>○ Double-click "**On any key pressed**" (under "Keyboard")<br>■ Right-click event > Select "**Make OR block**"<br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Mouse**"<br>○ Double-click "**On any click**" (under "Mouse")<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Wait**" (under "Time")<br>■ **Seconds**: 1.5<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**System**" |

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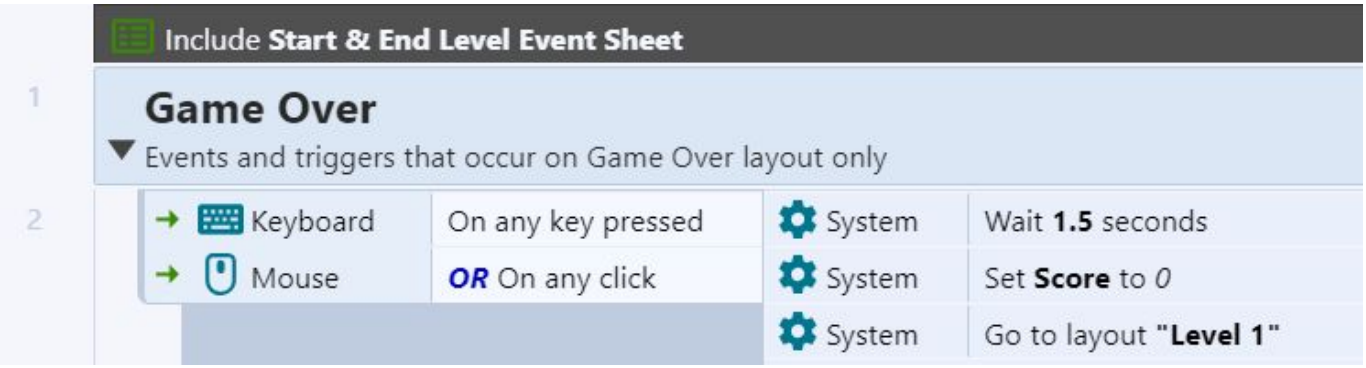
| | | ○ Double-click "**Set value**" (under "Global & local variables")<br>■ **Variable**: Score<br>■ **Value**: 0<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Go to layout (by name)**" (under "Layout")<br>■ **Layout**: "Level 1"<br>○ Select DONE |
|  | | |
| ❑ | Lock "Content" Layer | ■ Select "Content" layer > Click lock icon |
| ❑ | Create Global Variable to Track Next Game Layout | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br><br>■ Right-click "**Add global variable**"<br>○ **Name**: NextLayout<br>○ **Type**: String<br>○ **Initial value**: <empty><br>○ **Description**: Game layout to go to next<br>○ Select OK |
| | | |
| ❑ | Add "Go to Next Game Layout" Action to "Success" Event | ■ Under the "Success" event (collision with Exit & CoinsLeft = 0) within the "**End of Level**" event group, click "**Add action**":<br>○ Double-click "**System**"<br>○ Double-click "**Go to layout (by name)**" (under "Layoutl")<br>■ **Layout**: NextLayout<br>○ Select DONE |
| ❑ | Remove "Restart Layout" Action from "Success" Event | ■ Under the "Success" event (collision with Exit & CoinsLeft = 0) within the "**End of Level**" event group:<br>○ Right-click "**System \| Restart layout**" action > Delete |
| ❑ | Add Alien "Success" Animation Action | ■ Under the "Success" event (collision with Exit & CoinsLeft = 0) within the "**End of Level**" event group, click "**Add action**":<br>○ Double-click "**Alien**"<br>○ Double-click "**Set animation**" (under "Animations")<br>■ **Animation**: "Success" |

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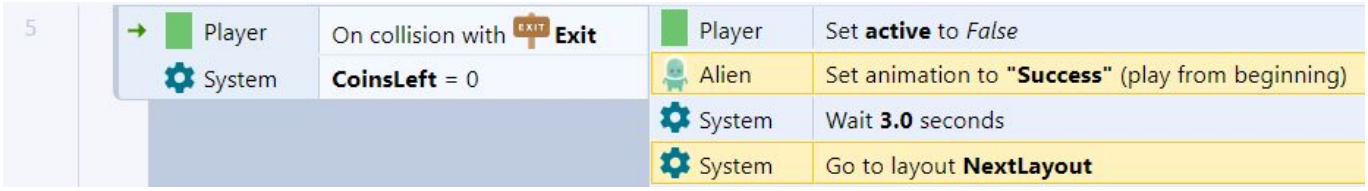
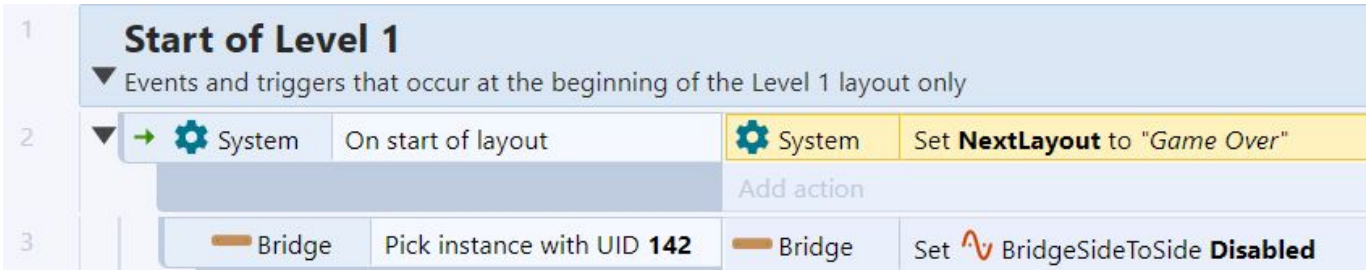
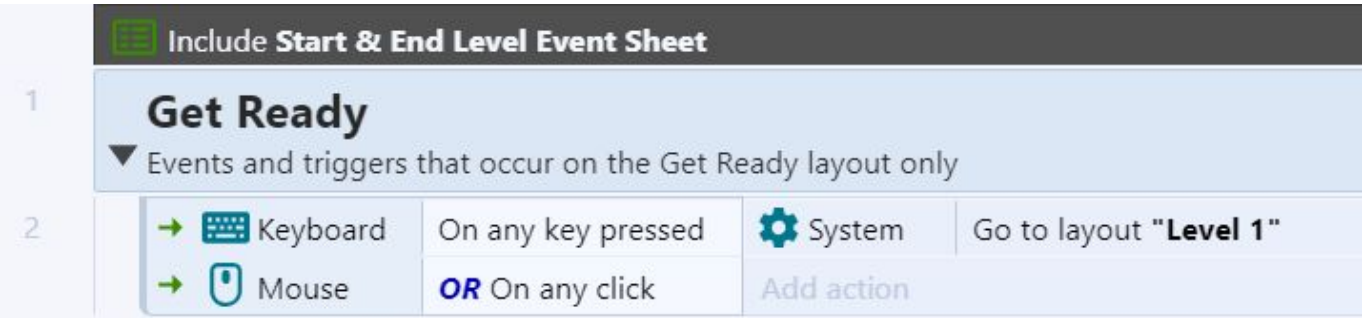
| | | ○ Select DONE<br>■ Drag action up so that it is listed second for the event |
|  | | |
| ❑ | Add "Set Next Layout" Action to "On Start of Layout" Event in "Level 1 Event Sheet" | ■ Right-click "**Level 1 Event Sheet**" > Select "Open"<br>■ Under the "**On start of layout**" event within the "**Start of Level 1**" event group, click "**Add action**":<br>○ Double-click "**System**"<br>○ Double-click "**Set value**" (under "Global & local variables")<br>■ **Variable**: NextLayout<br>■ **Value**: "Game Over"<br>○ Select DONE |
|  | | |
| ❑ | Create "Get Ready" Layout | Right-click LAYOUTS > Select "**Add layout**" > Select "**Add event sheet**" option |
| ❑ | Rename Layout | Right-click "Layout 1" > Rename to "**Get Ready**" |
| ❑ | Rename Event Sheet | Right-click "Event sheet 1" > Rename to "**Get Ready Event Sheet**" |
| ❑ | Set Layout Properties | ■ Select "Get Ready" > Set the following properties:<br>○ Layout<br>■ **Size** (Width x Height): 1920 x 1080<br>○ Editor<br>■ **Margins** (Width x Height): 500 x 500 |
| ❑ | Rename "Layer 0" | Right-click "Layer 0" > Rename to "**Background**" |
| ❑ | Create "Get Ready" Background | ■ Make sure "Background" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**GetReady**" > INSERT<br>■ When crosshair appears, click inside "Get Ready" layout > Animations Editor will appear |

| | | |
|---|---|---|
| | | ■ Click folder icon > Browse to and OPEN: **get-ready-1920x1080.png**<br>■ Select "Edit the image points" option<br>○ Change existing "Origin" image point<br>■ Set **X** to **960**<br>■ Set **Y** to **540**<br>■ Click X to close; GetReady object should be on "Background" layer |
| ❑ | Position "Get Ready" Background | ■ Right-click "GetReady" object on "Get Ready" layout > "Align" > Layout > **Center horizontal**<br>■ Right-click "GetReady" object on "Get Ready" layout > "Align" > Layout > **Center vertical** |
| ❑ | Lock "Background" Layer | Select "Background" layer > Click lock icon |
| ❑ | Create "Content" Layer | ■ Under "Layers" > Right-click "**Add layer at top**" > Rename new layer to "**Content**"<br>■ Make sure the "Content" layer is active, unlocked, and listed **above** the "Background" layer |
| ❑ | Create Author Text | ■ Make sure "Content" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "**Text**" > Name: "**Author**" > INSERT<br>■ When crosshair appears, click inside "Get Ready" layout; you should see an Author object should be on "Content" layer |
| ❑ | Set Author Properties | ■ Select "**Author**" > Set/confirm the following properties:<br>○ Common<br>■ **Position**: 580, 714<br>■ **Size** (Width x Height): 760 x 120<br>■ **Opacity**: 40%<br>○ Properties<br>■ **Text**: Game Project by <your name here><br>■ **Font**: almendra-bold<br>■ **Size**: 36<br>■ **Color**: 51 (Red), 56 (Green), 57 (Blue)<br>■ **Horizontal alignment**: Center |
| ❑ | Create Credits Text | ■ Make sure "Content" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "**Text**" > Name: "**Credits**" > INSERT<br>■ When crosshair appears, click inside "Get Ready" layout; Credits object should be on "Content" layer |
| ❑ | Set Credits Properties | ■ Select "**Credits**" > Set/confirm the following properties:<br>○ Common |

| | | |
|---|---|---|
| | | ■ **Position**: 360, 800<br>■ **Size** (Width x Height): 1200 x 160<br>■ **Opacity**: 70%<br>○ Properties<br>■ **Text**: <copy and paste from credits.txt><br>■ **Font**: almendra-bold<br>■ **Size**: 16<br>■ **Color**: 51 (Red), 56 (Green), 57 (Blue)<br>■ **Horizontal alignment**: Center<br>■ **Vertical alignment**: Center |
| ❑ | Include "Start & End Level Event Sheet" in "Get Ready Event Sheet" | ■ Right-click "**Get Ready Event Sheet**" > Select "Open"<br>■ Right-click > "**Include event sheet**" > Double-click "**Start & End Level Event Sheet**" |
| ❑ | Create "Get Ready" Event Group | ■ Right-click > "**Add group**"<br>○ **Name**: Get Ready<br>○ **Description**: Events and triggers that occur on the Get Ready layout only<br>○ Select OK |
| ❑ | Add "Press Anything to Play" Event | ■ Click "**Add event to 'Get Ready'**"<br>○ Double-click "**Keyboard**"<br>○ Double-click "**On any key pressed**" (under "Keyboard")<br>■ Right-click event > Select "**Make OR block**"<br>■ Right-click event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Mouse**"<br>○ Double-click "**On any click**" (under "Mouse")<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Go to layout (by name)**" (under "Layout")<br>■ **Layout**: "Level 1"<br>○ Select DONE |
| |  | |
| ❑ | Lock "Content" Layer | Select "Content" layer > Click lock icon |
| ❑ | Update Project Properties | ■ Select "Platformer" > Set the following property:<br>○ Startup<br>■ **First layout**: Get Ready |

| | | |
|---|---|---|
| ❑ | Preview Layout | From "Get Ready" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 🖫 |

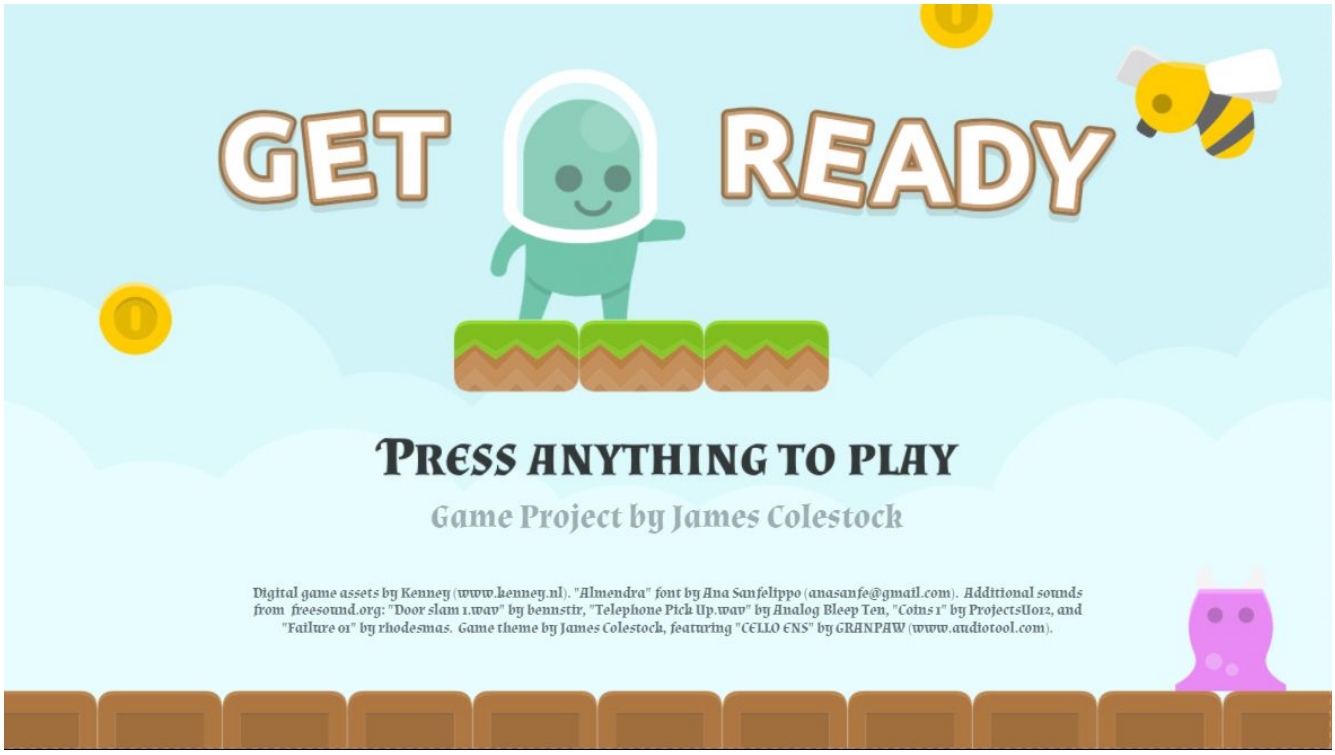



**FIGURE 16**: Snapshot of "Get Ready" Layout (all layers)

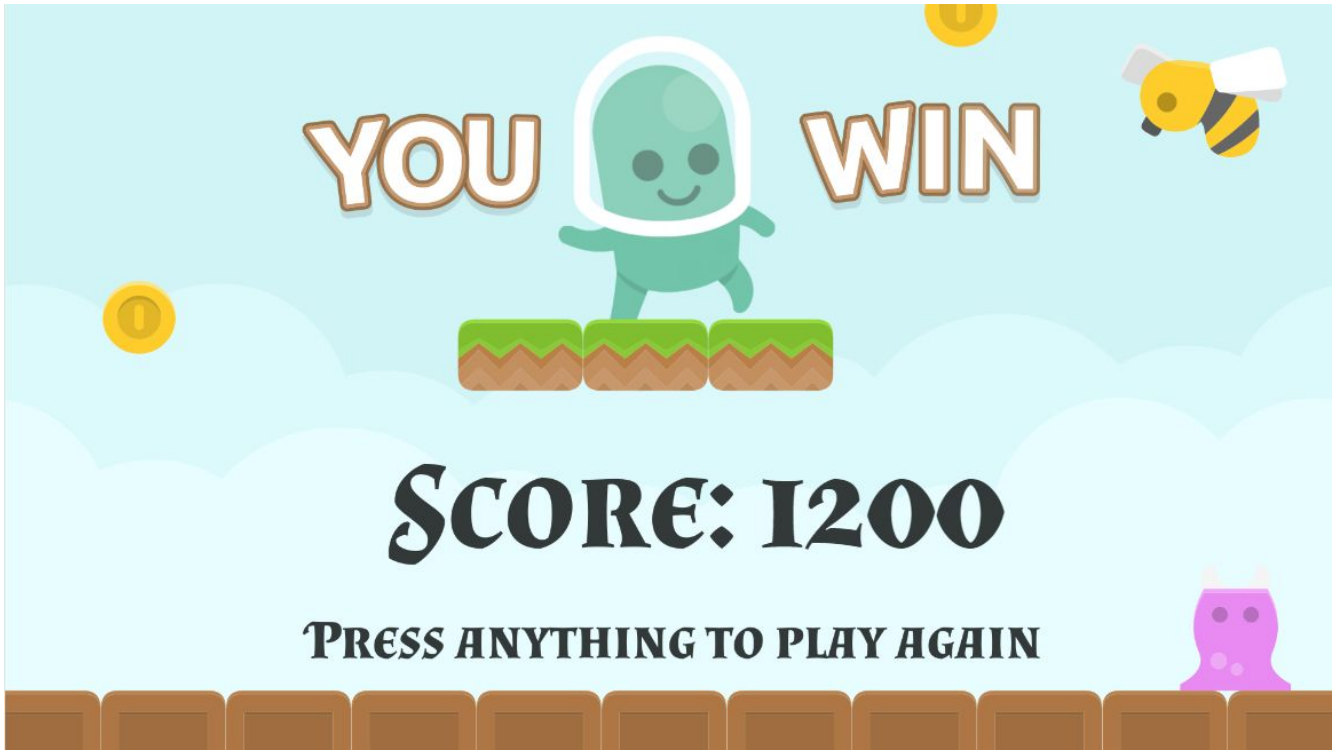



**FIGURE 17**: Snapshot of "Game Over" Layout (all layers)

## Fresh Beats

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Import Game Sounds | ■ Right-click SOUNDS > Select "Import sounds"<br>■ Browse to and IMPORT the following files:<br>○ **door-slam.wav**<br>○ **game-over.wav**<br>○ **game-theme.wav**<br>○ **pick-up.wav**<br>○ **switch.wav**<br>○ **tada.wav** |
| ❑ | Add Audio Support to Project | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "**Audio**" (under "Media") > INSERT |
| ❑ | Add Actions to Play "Game Theme" At Start of Each Level | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br>■ Under the "**On start of layout**" event within the "**Start of Level**" event group click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Stop all**" (under "Audio")<br>■ Under the "**On start of layout**" event within the "**Start of Level**" event group click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Play**" (under "Audio")<br>■ **Audio file**: game-theme<br>■ **Loop**: looping<br>■ **Volume**: -20<br>○ Select DONE<br>■ Drag actions up so that they are listed first for the event |

| | | |
|---|---|---|
| ❑ | Add Actions to Play "Game Over" On Collision With Enemies | ■ Under the "**On collision with Enemies**" event within the "**End of Level**" event group click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Stop all**" (under "Audio")<br>■ Under the "**On collision with Enemies**" event within the "**End of Level**" event group click "**Add action**":<br>○ Double-click "**Audio**" |

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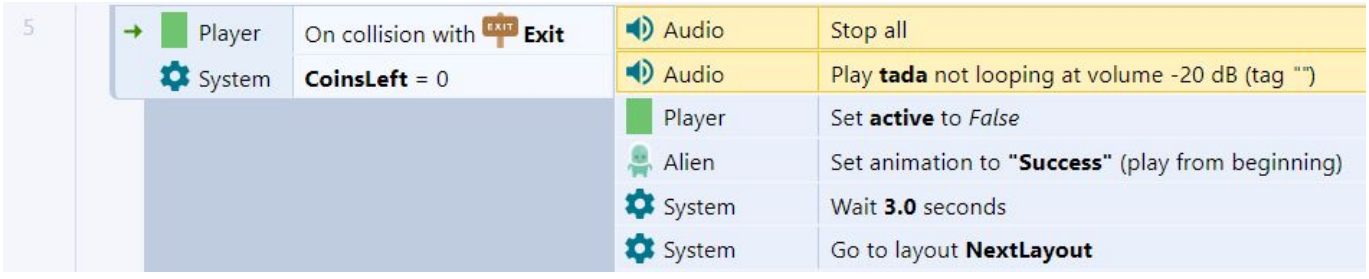
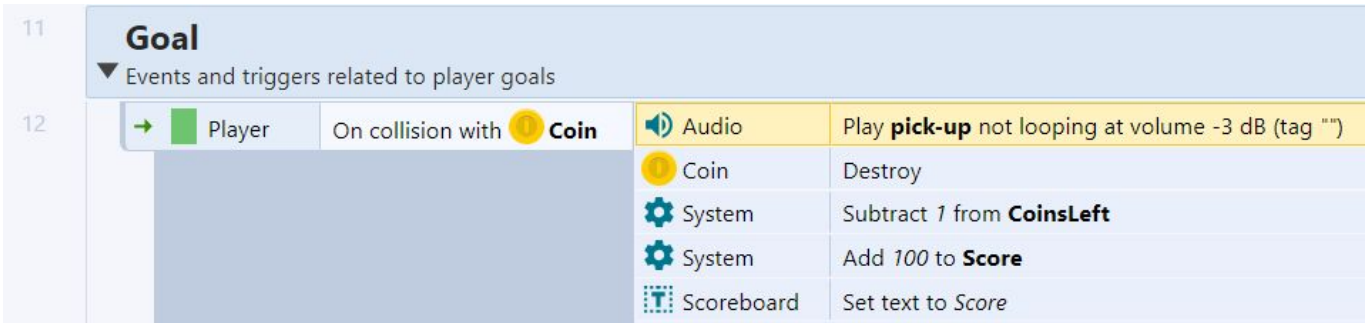
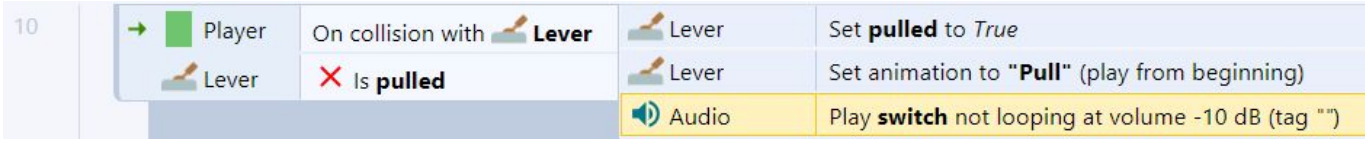
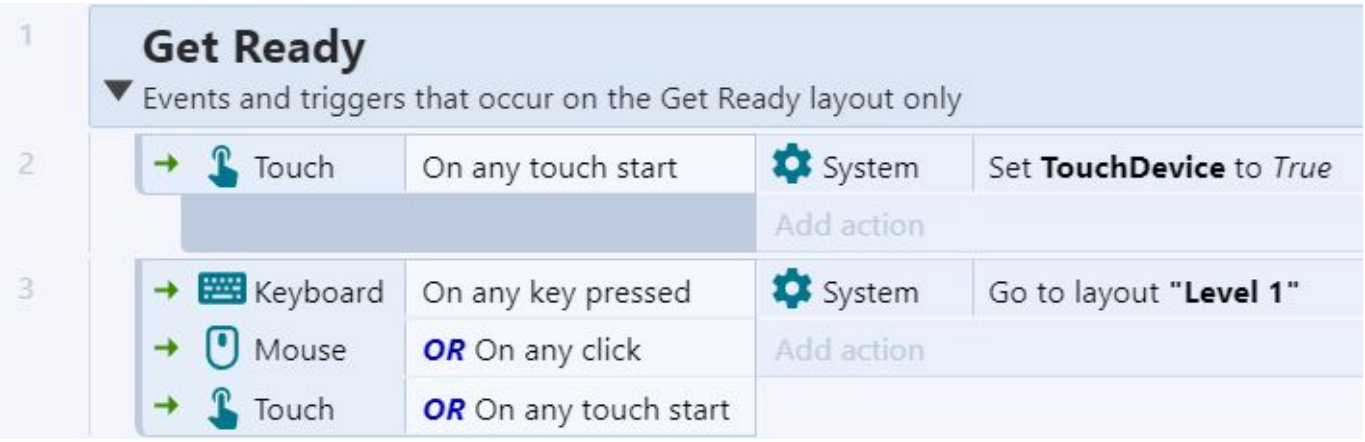
| | | ○ Double-click "**Play**" (under "Audio")<br>■ **Audio file**: game-over<br>■ **Loop**: not looping<br>■ **Volume**: -5<br>○ Select DONE<br><br>■ Drag actions up so that they are listed first for the event |
| | | |
| ❑ | Add Actions to Play "Ta Da" Upon "Success" Event | ■ Under the "Success" event (collision with Exit & CoinsLeft = 0) within the "**End of Level**" event group, click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Stop all**" (under "Audio")<br><br>■ Under the "Success" event (collision with Exit & CoinsLeft = 0) within the "**End of Level**" event group, click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Play**" (under "Audio")<br>■ **Audio file**: tada<br>■ **Loop**: not looping<br>■ **Volume**: -20<br>○ Select DONE<br><br>■ Drag actions up so that they are listed first for the event |
| | |  |
| ❑ | Add Action to Play "Pick Up" When Coins Are Collected | ■ Right-click "**Player Event Sheet**" > Select "Open"<br><br>■ Under the "**On collision with Coin**" event within the "**Goal**" event group, click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Play**" (under "Audio")<br>■ **Audio file**: pick-up<br>■ **Loop**: not looping<br>■ **Volume**: -3 |

| | | |
|---|---|---|
| | | ○ Select DONE<br>■ Drag action up so that it is listed first for the event |
| | |  |
| ❑ | Add Action to Play "Door Slam" When Castle Door Closes | ■ Right-click "**Level 1 Event Sheet**" > Select "Open"<br>■ Under the "**On animation 'Close' finished**" event within the "**Castle Door**" event group, click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Play**" (under "Audio")<br>■ **Audio file**: door-slam<br>■ **Loop**: not looping<br>■ **Volume**: -10<br>○ Select DONE<br>■ Drag action up so that it is listed first for the event |
| | | |
| ❑ | Add Action to Play "Switch" When Lever Is Pulled | ■ Under the "**On collision with Lever and pulled = False**" event within the "**Lever**" event group, click "**Add action**":<br>○ Double-click "**Audio**"<br>○ Double-click "**Play**" (under "Audio")<br>■ **Audio file**: switch<br>■ **Loop**: not looping<br>■ **Volume**: -10<br>○ Select DONE<br>■ Drag action down so that it is listed last for the event |
| | |  |
| ❑ | Preview Layout | From "Get Ready" layout > Click "Preview" in main toolbar |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click 🖫 |

## Touch Controls

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Add Touch Object to Project | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "**Touch**" > Name: "Touch" > INSERT |
| ❑ | Create Global Variable to Track Whether User is Playing On Touch-Enabled Device | ■ Right-click "**Get Ready Event Sheet**" > Select "Open"<br>■ Right-click "**Add global variable**":<br>○ **Name**: TouchDevice<br>○ **Type**: Boolean<br>○ Uncheck "**Initial Value**"<br>○ **Description**: If user is playing on a touch-enabled device<br>○ Select OK |
| | *Global boolean* **TouchDevice** = false | *If user is playing on a touch-enabled device* |
| ❑ | Add "Device Detection" Event | ■ Click "**Add event to 'Get Ready'**"<br>○ Double-click "**Touch**"<br>○ Double-click "**On any touch start**" (under "Touch")<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Set boolean** (under "Global & local variables")<br>■ **Variable**: TouchDevice<br>■ **Value**: True<br>○ Select DONE<br>■ Drag event to the top of the event group |
| ❑ | Add "Touch" Condition to "Press Anything to Play" Event | ■ Right-click "**Press Anything to Play**" event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Touch**"<br>○ Double-click "**On any touch start**" (under "Touch") |



| | | |
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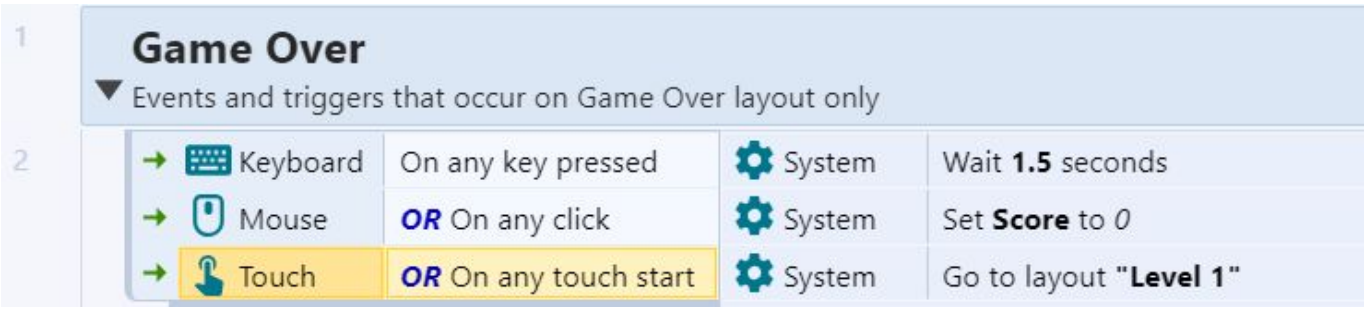
| ❑ | Add "Touch" Condition to "Press Anything to Play Again" Event | ■ Right-click "**Game Over Event Sheet**" > Select "Open"<br>■ Right-click "**Press Anything to Play Again**" event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Touch**"<br>○ Double-click "**On any touch start**" (under "Touch") |

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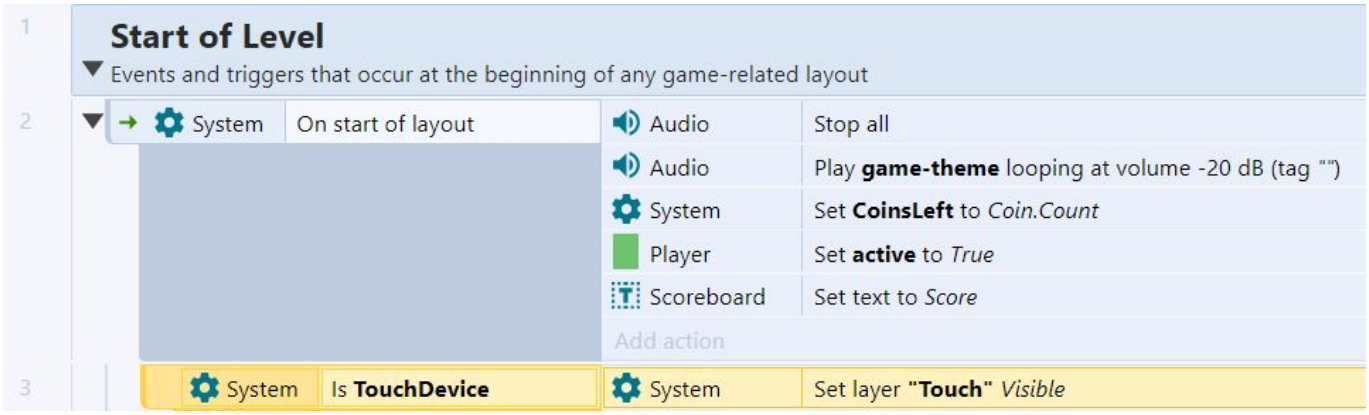
|---|---|---|
| ❑ | Create "Touch" Layer | ■ Open "**Level 1**" Layout<br>■ Under "Layers" > Right-click "**Add layer at top**" > Rename new layer to "**Touch**"<br>■ Make sure the "Touch" layer is active, unlocked, and listed **above** the "HUD" layer |
| ❑ | Set "Touch" Layer Properties | ■ Select "Touch" layer > Set the following properties:<br>○ Layer properties<br>■ Uncheck "**Initially visible**"<br>○ Scroll & zoom<br>■ **Parallax** (X x Y): 0% x 0% |
| ❑ | Create Touch Left Arrow | ■ Make sure "Touch" layer is active and unlocked<br>■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**TouchLeft**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **touch-left-240x240.png**<br>■ Select "Edit the collision polygon" option<br>■ Right-click "**Set to bounding box**"<br>■ Click X to close; TouchLeft object should be on "Touch" layer |
| ❑ | Set Touch Left Arrow Properties | ■ Select "**TouchLeft**" > Set the following properties:<br>○ Common<br>■ **Position**: 192, 960<br>■ **Opacity**: 50% |
| ❑ | Create Touch Right Arrow | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**TouchRight**" > INSERT |

| | | |
|---|---|---|
| | | ■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **touch-right-240x240.png**<br>■ Select "Edit the collision polygon" option<br>■ Right-click "**Set to bounding box**"<br>■ Click X to close; TouchRight object should be on "Touch" layer |
| ❑ | Set Touch Right Arrow Properties | ■ Select "**TouchRight**" > Set the following properties:<br>○ Common<br>■ **Position:** 480, 960<br>■ **Opacity:** 50% |
| ❑ | Create Touch Up Arrow | ■ Right-click OBJECT TYPES > Select "Add new object type"<br>■ Select "Sprite" > Name: "**TouchUp**" > INSERT<br>■ When crosshair appears, click inside "Level 1" layout > Animations Editor will appear<br>■ Click folder icon > Browse to and OPEN: **touch-up-240x240.png**<br>■ Select "Edit the collision polygon" option<br>■ Right-click "**Set to bounding box**"<br>■ Click X to close; TouchUp object should be on "Touch" layer |
| ❑ | Set Touch Up Arrow Properties | ■ Select "**TouchUp**" > Set the following properties:<br>○ Common<br>■ **Position**: 1728, 960<br>■ **Opacity**: 50% |
| ❑ | Lock "Touch" Layer | Select "Touch" layer > Click lock icon |
| ❑ | Add Subevent to Show "Touch" Layer | ■ Right-click "**Start & End Level Event Sheet**" > Select "Open"<br>■ Right-click "**On start of layout**" event > Select "**Add**" > Select "**Add sub-event**":<br>○ Double-click "**System**"<br>○ Double-click "**Is boolean set**" (under "Global & local variables")<br>■ **Variable**: TouchDevice<br>○ Select DONE<br>■ Click "**Add action**"<br>○ Double-click "**System**"<br>○ Double-click "**Set layer visible**" (under "Layers")<br>■ **Layer**: "Touch"<br>■ **Visibility**: Visible<br>○ Select DONE |

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|---|---|---|
| ❑ | Create Touch Events to Move Player | ■ Right-click "**Player Event Sheet**" > Select "Open"<br><br>■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchRight<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Simulate control**" (under "Platform")<br>■ **Control**: Right<br>○ Select DONE<br><br>■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchLeft<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Simulate control**" (under "Platform")<br>■ **Control**: Left<br>○ Select DONE<br><br>■ Click "**Add event to 'Movement'**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchUp<br>○ Select DONE<br><br>■ Click "**Add action**"<br>○ Double-click "**Player**"<br>○ Double-click "**Simulate control**" (under "Platform")<br>■ **Control**: Jump<br>○ Select DONE<br><br>■ Drag events to the top so that they are the listed immediately after the "**Player \| active = True**" subevent |

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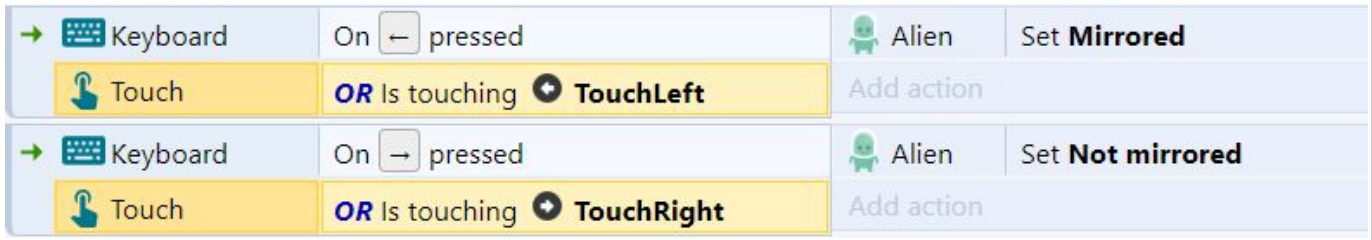
|---|---|---|
| ❑ | Add Touch Conditions to Events that Mirror Player | ■ Right-click "**Mirror on Left arrow pressed**" event > Select "**Make OR block**"<br>■ Right-click "**Mirror on Left arrow pressed**" event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchLeft<br>○ Select DONE<br>■ Right-click "**Mirror on Right arrow pressed**" event > Select "**Make OR block**"<br>■ Right-click "**Mirror on Right arrow pressed**" event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchRight<br>○ Select DONE |

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|---|---|---|
| ❑ | Add Touch Conditions to Event that Sets "Walk" Animation | ■ Right-click "**Set animation to 'Walk'**" event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchLeft<br>○ Select DONE |

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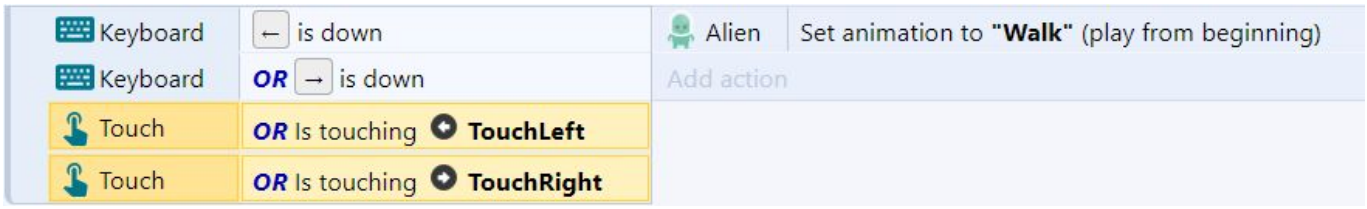
|---|---|---|
| | | ■ Right-click "**Set animation to 'Walk'**" event > Select "**Add**" > Select "**Add another condition**"<br>○ Double-click "**Touch**"<br>○ Double-click "**Is touching object**" (under "Touch")<br>■ **Object**: TouchRight<br>○ Select DONE |
|  | | |
| ❑ | Debug Layout | From "Get Ready" layout > Click "Debug layout" in main toolbar |
| ❑ | Set Touch Properties | ■ Select "**Touch**" > Set the following properties:<br>○ Properties<br>■ **Use mouse input**: No<br><br>**Note**: Toggle the value of the **Use mouse input** property as needed to test touch controls from a PC; **make sure that before publishing, however, that the value is set to 'No'** so that touch controls are not shown to those using a keyboard and mouse. |
| ❑ | Save Project | PROJECT > SAVE or (**Ctrl + S**) or Click |

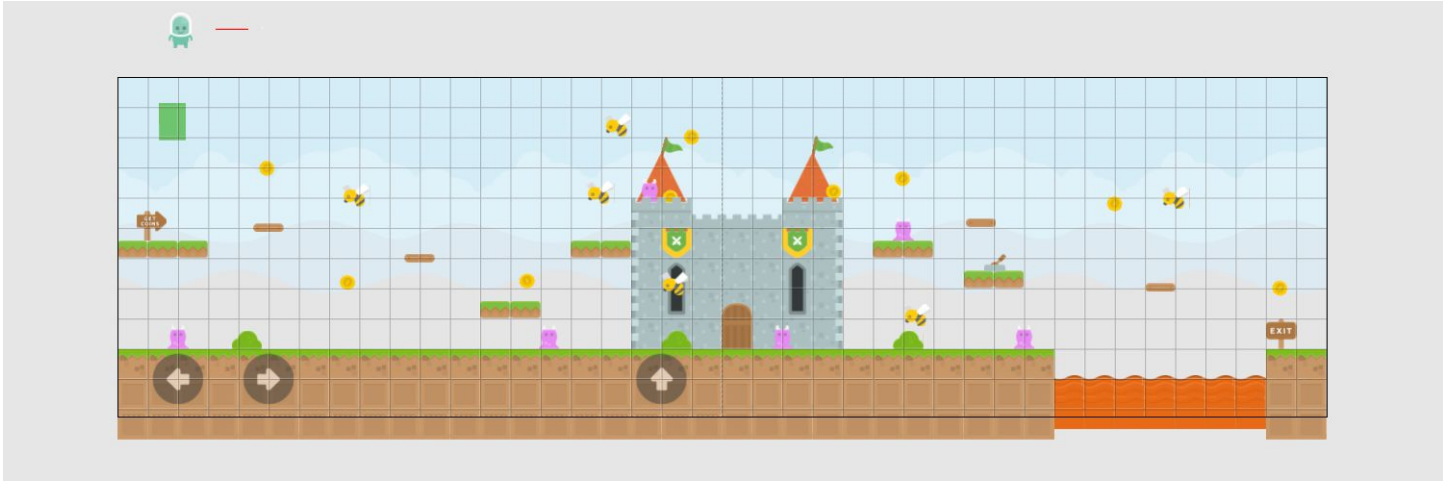


**FIGURE 18**: Snapshot of "Level 1" Layout (all layers)

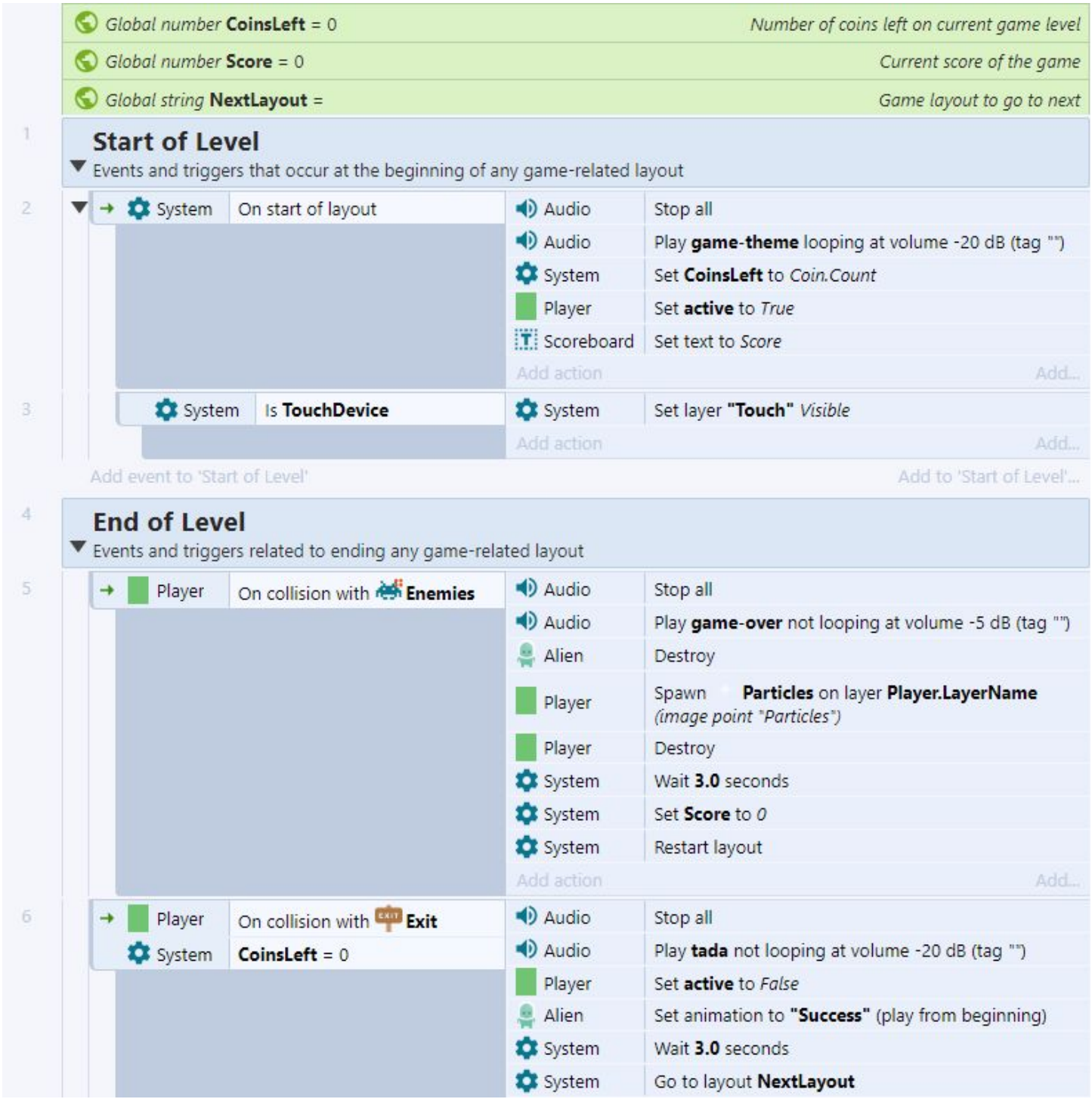



**FIGURE 19**: Final "Start & End Level Event Sheet"

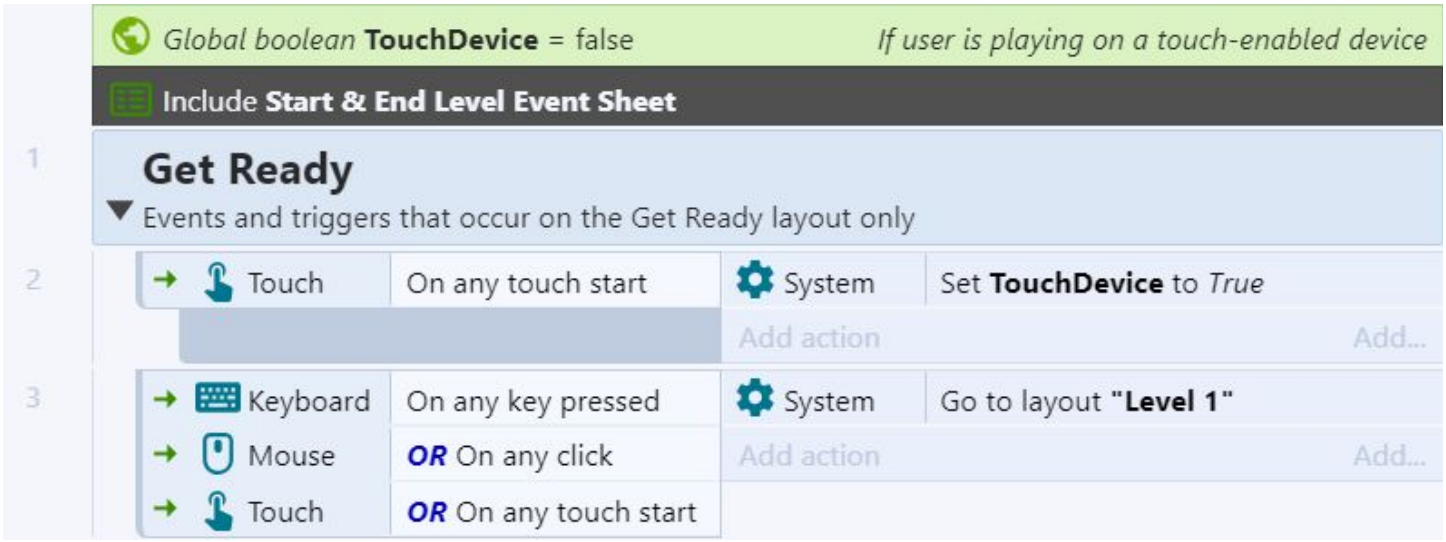



**FIGURE 20**: Final "Get Ready Event Sheet"

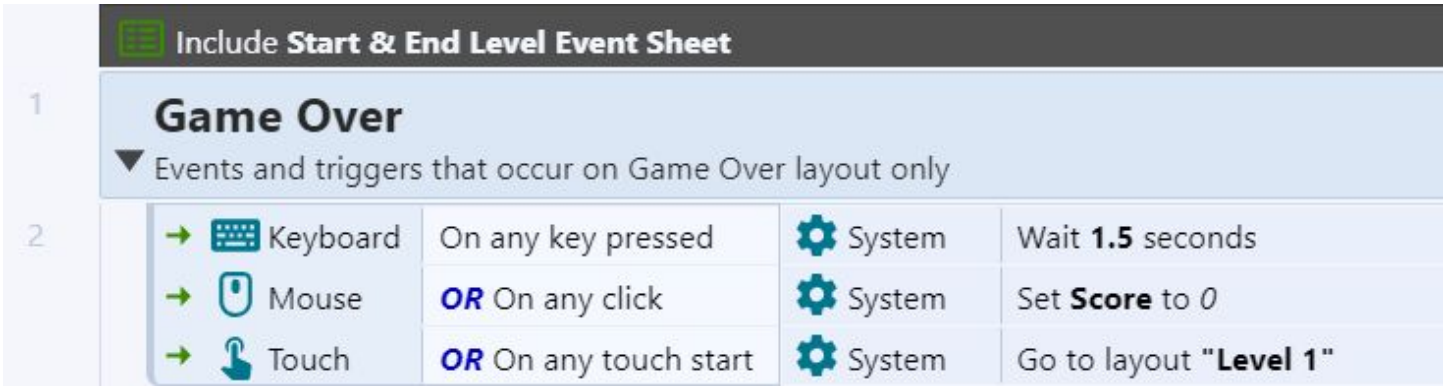



**FIGURE 21**: Final "Game Over Event Sheet"

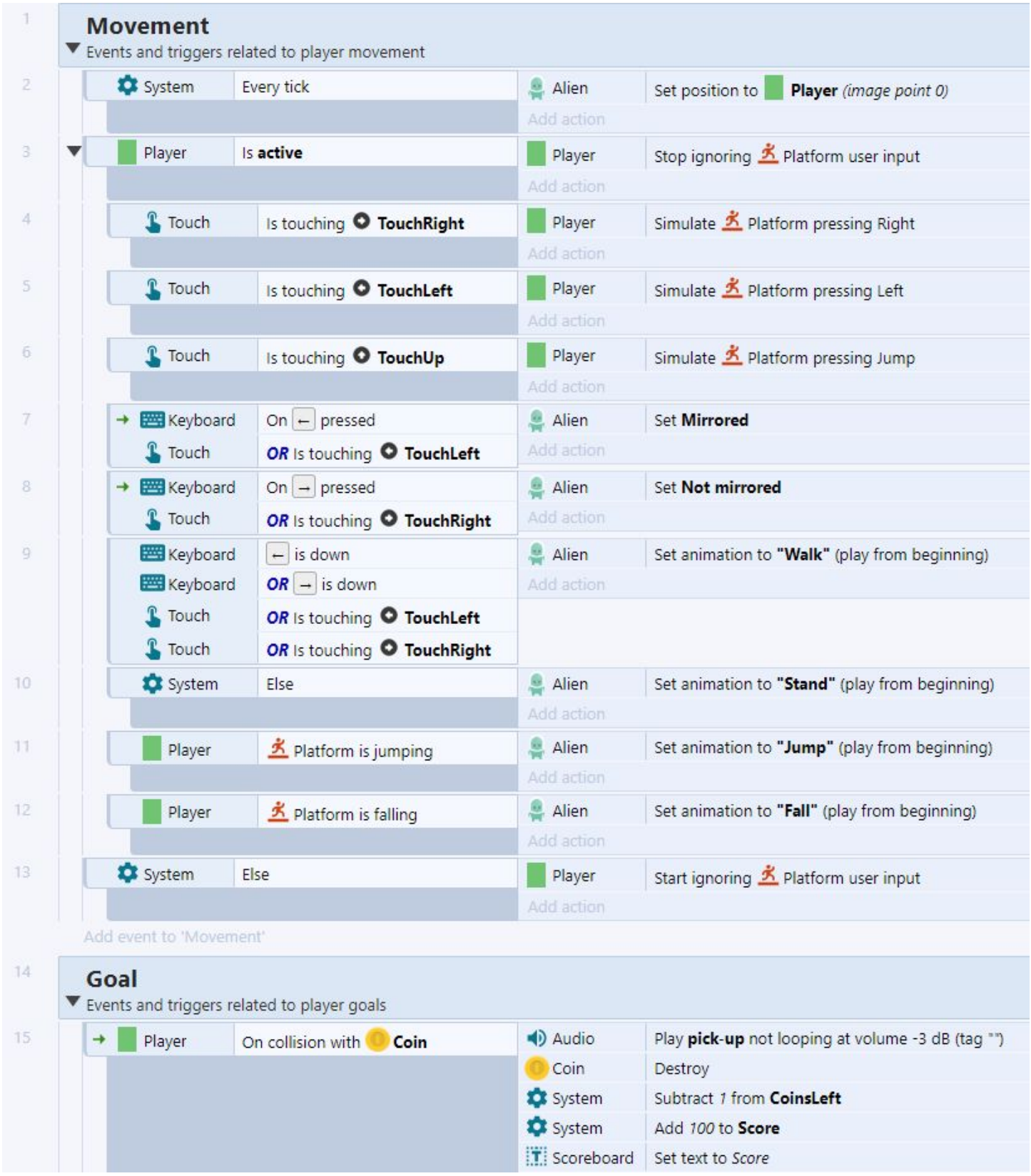



**FIGURE 22**: Final "Player Event Sheet"

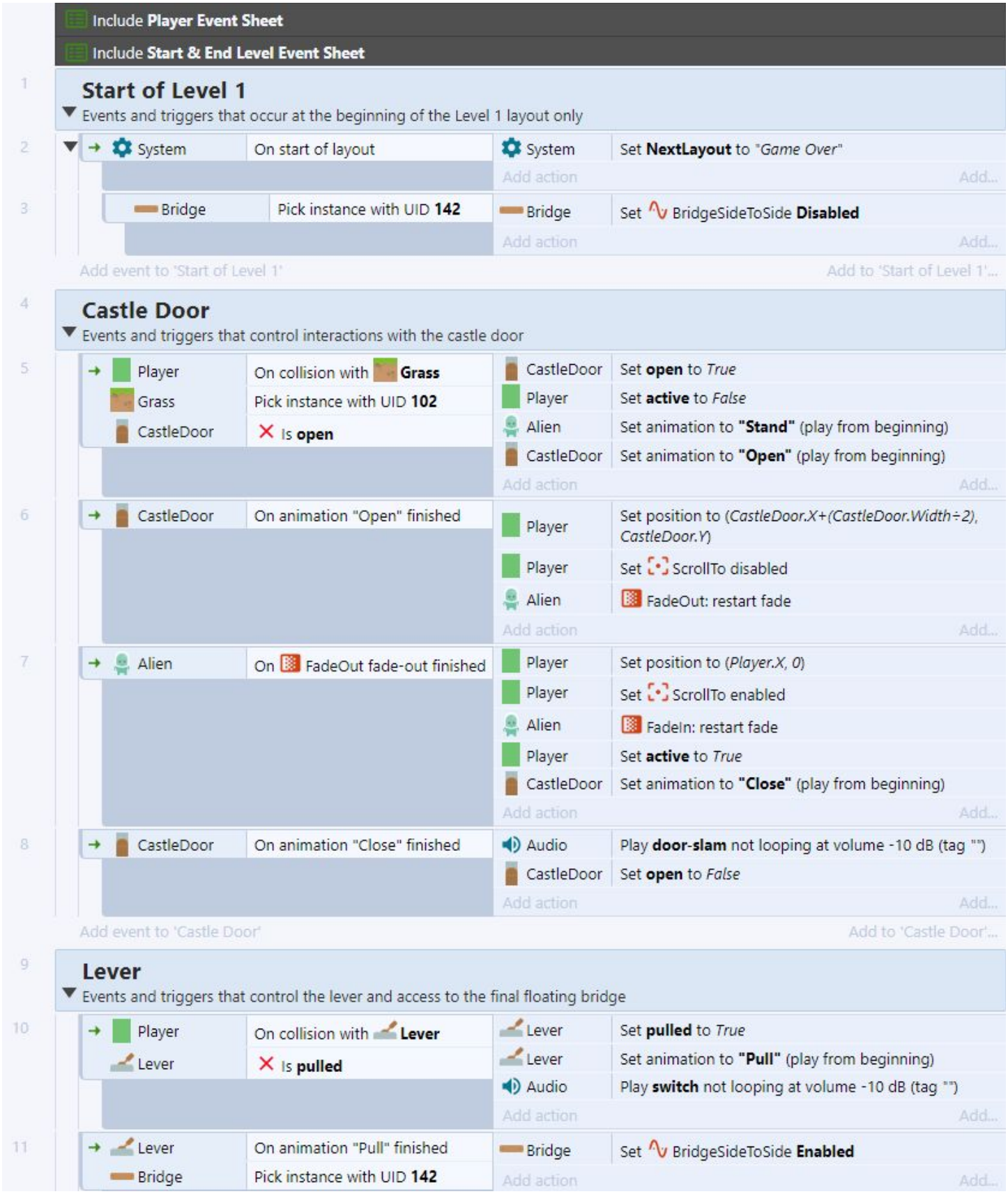



**FIGURE 23**: Final "Level 1 Event Sheet"

# Publishing

| Step | | Detailed Instructions |
|---|---|---|
| ❑ | Export Project using Scirra Arcade Option | ■ PROJECT > EXPORT > Double-click "**Scirra Arcade**"<br>○ Export options<br>■ Check "**Deduplicate images**"<br>■ Check "**Recompress images**"<br>■ Check "**Minify script**"<br>○ Select NEXT<br>■ Click "**Download Platformer.zip**"; Select OK |
| ❑ | Log On to Scirra Arcade | ■ Navigate to **scirra.com/arcade/submit** in your browser<br>■ If necessary, create an account, providing a username, password, and email address; accept relevant terms and conditions |
| ❑ | Publish Game to Scirra Arcade | ■ Click "**Upload a Game**"<br>■ Upload File(s)<br>○ Click **"Choose File"** > Browse to and OPEN **Platformer.zip**<br>○ Click "**Upload**"<br>■ Game Details<br>○ **Game Name**: Platformer<br>○ **Description**: A model platform-style game that I built while learning Construct 3<br>○ **Short Description**: A model platform-style game<br>○ **Instructions**: [k]Left Arrow[/k] to go Left, [k]Right Arrow[/k] to go Right, and [k]Up Arrow[/k] to Jump!<br>○ **Category**: Tutorial Games<br>○ **Version**: 1.0.0.0<br>○ Check "**Mobile Enabled**"<br>○ Check "**Work in Progress**"<br>○ Uncheck "**Adult Content**"<br>○ Click "**Update Details**"<br>■ Pictures<br>○ Click **"Choose File"** > Browse to and OPEN **platformer-450x300.png**<br>○ Click "**Upload**"<br>■ Publish Game<br>○ Check **"Third Party Advertisments"**<br>○ Check **"Copyright Confirmation"**<br>○ Check **"Terms and Conditions"**<br>○ Check **"Game Content"**<br>○ Click "**Publish My Game!"** |

| | | |
|---|---|---|
| ❑ | Play Game | ■ Navigate to **scirra.com/arcade/game-manager** > Click "**Your Games**"<br>■ Annotate URL to published Platformer game, e.g., scirra.com/arcade/tutorial-games/platformer-XXXXX<br>■ Play game, testing thoroughly on multiple browsers and devices |

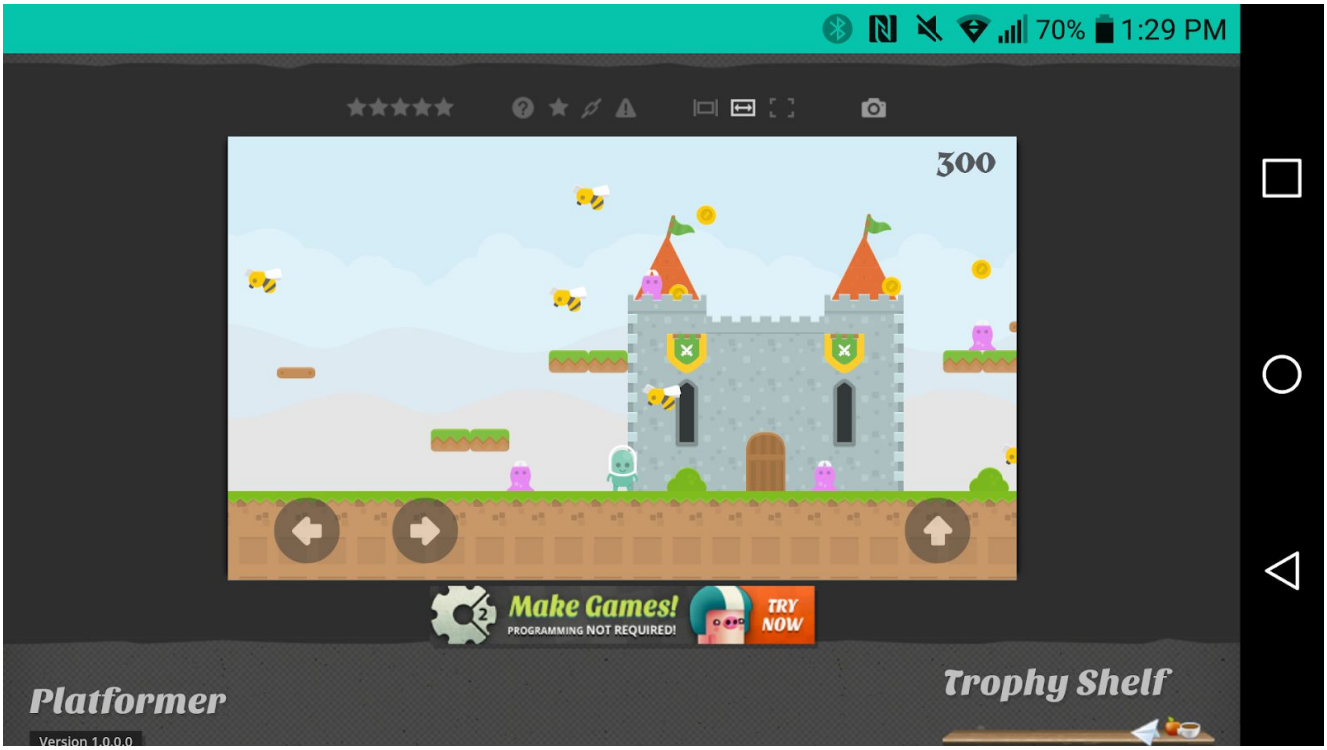



**FIGURE 24**: Final Platformer Game on Scirra Arcade (from smartphone)