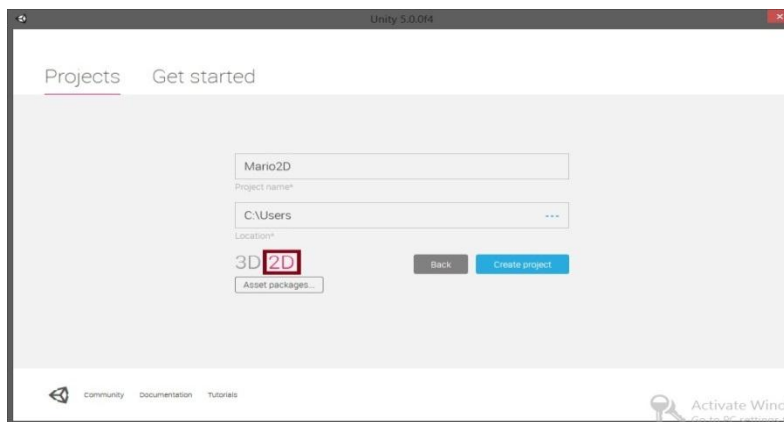
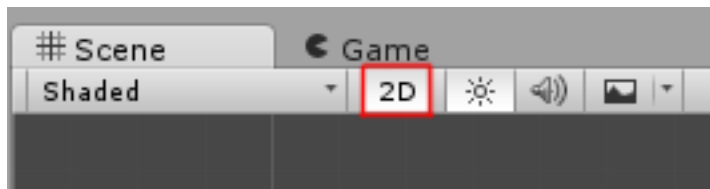
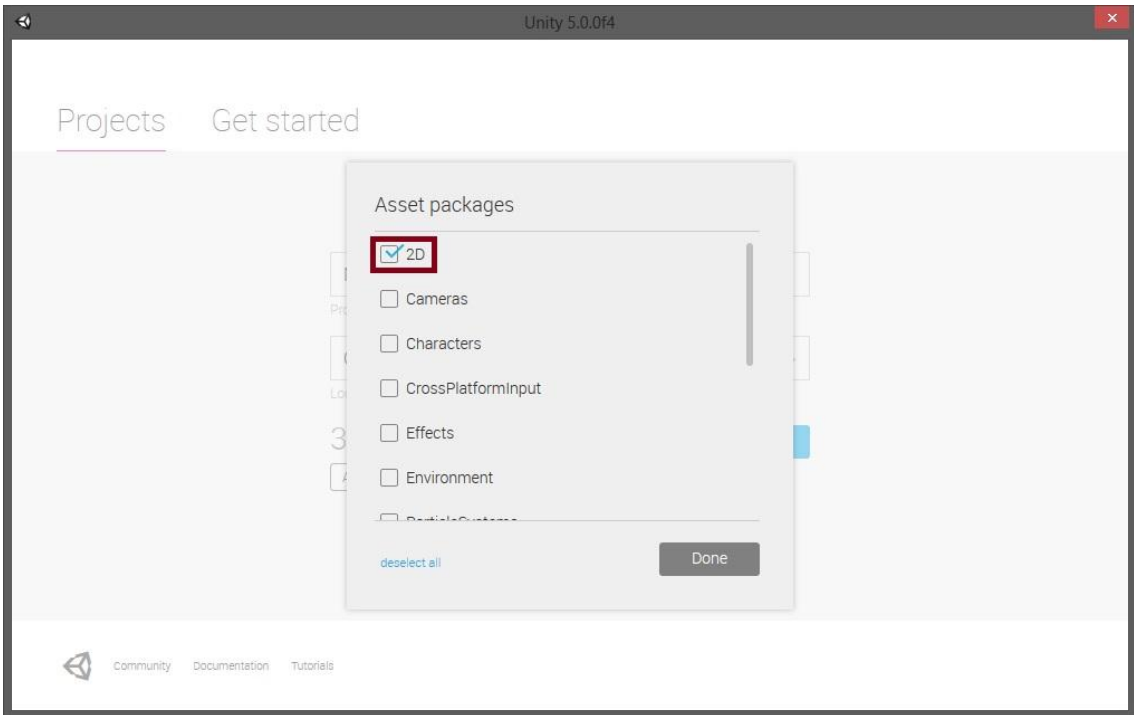
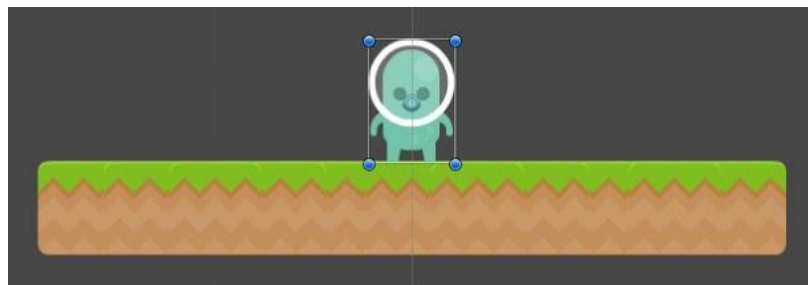


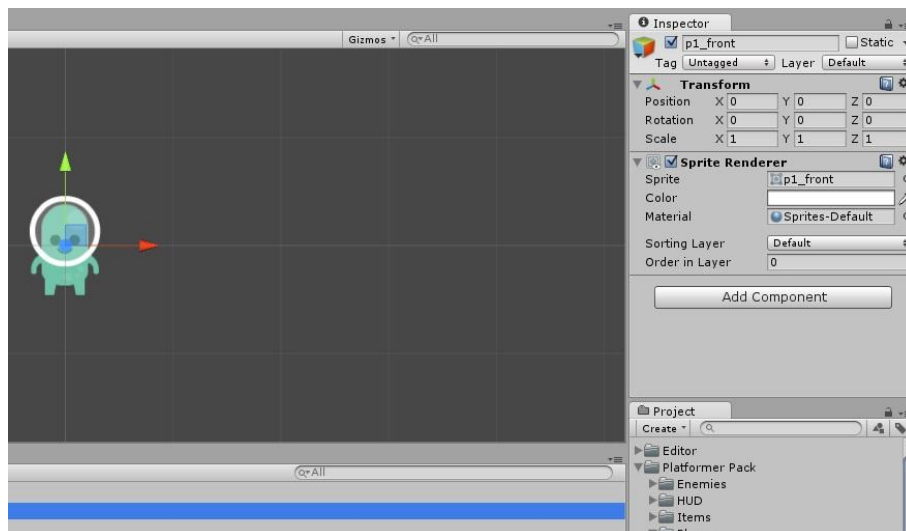
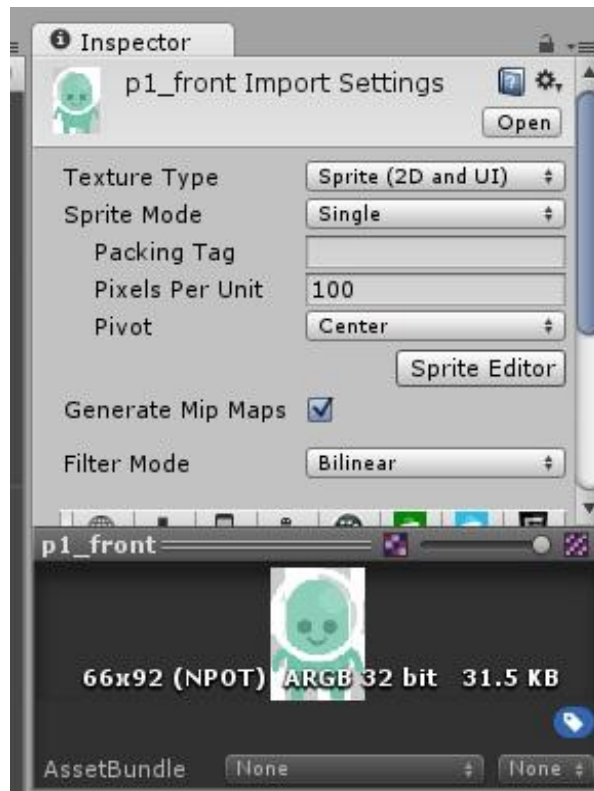
# Unity 5.x 2D Game Development Blueprints

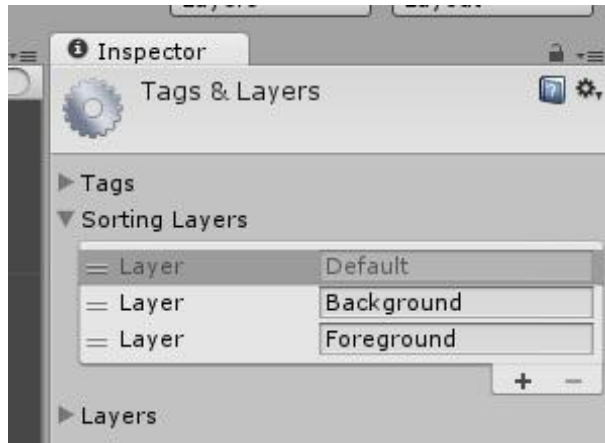
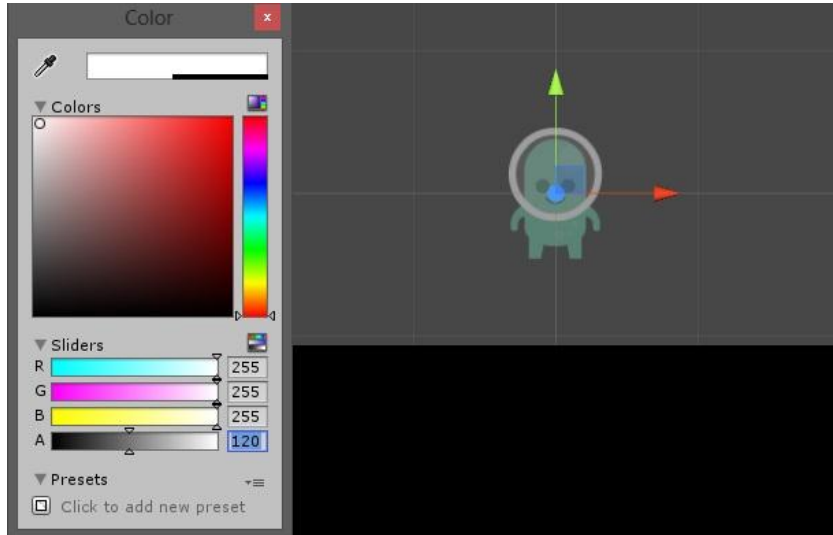
## Chapter 1: Sprites

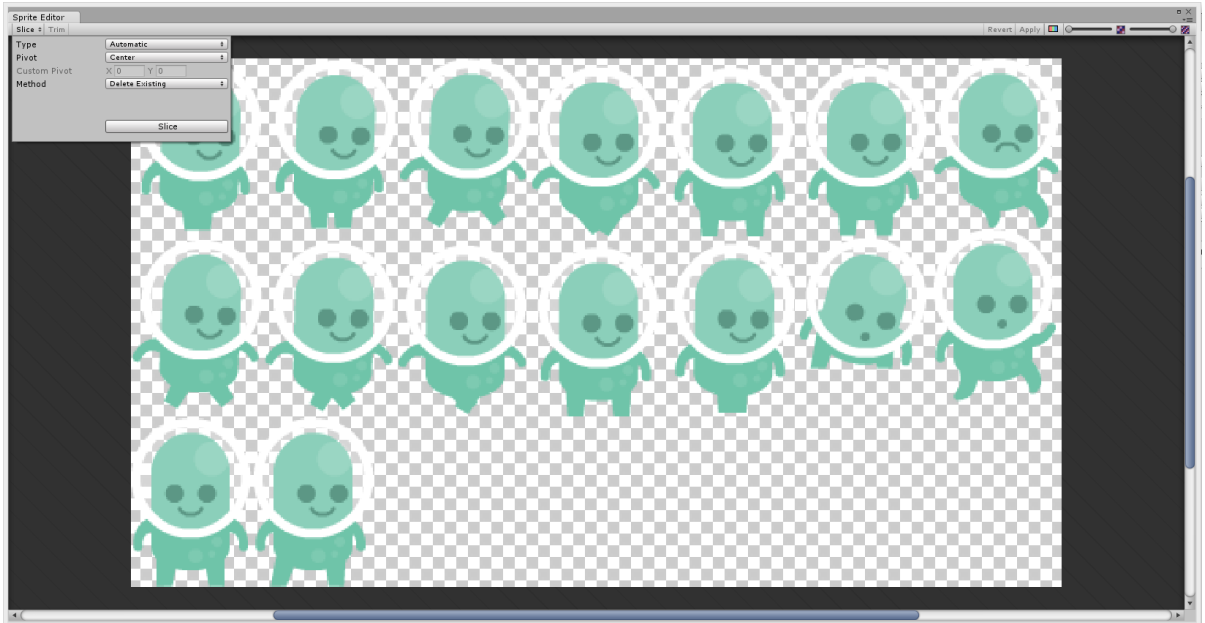
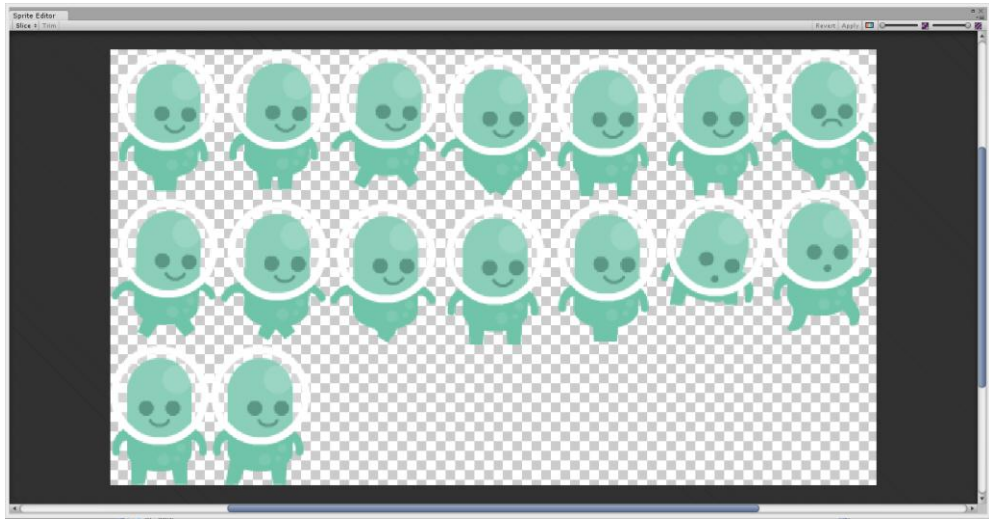


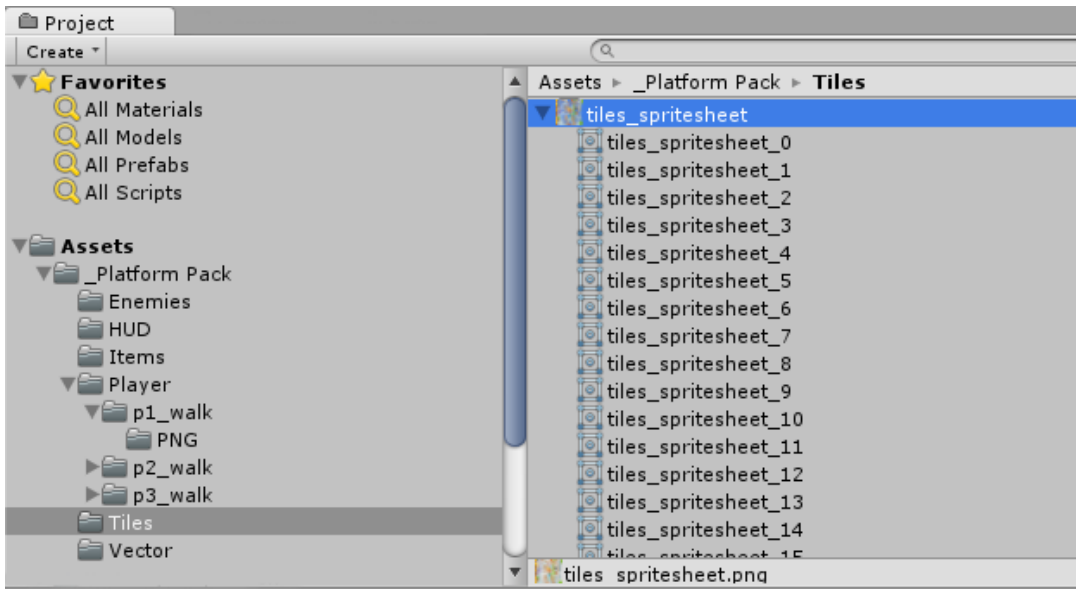
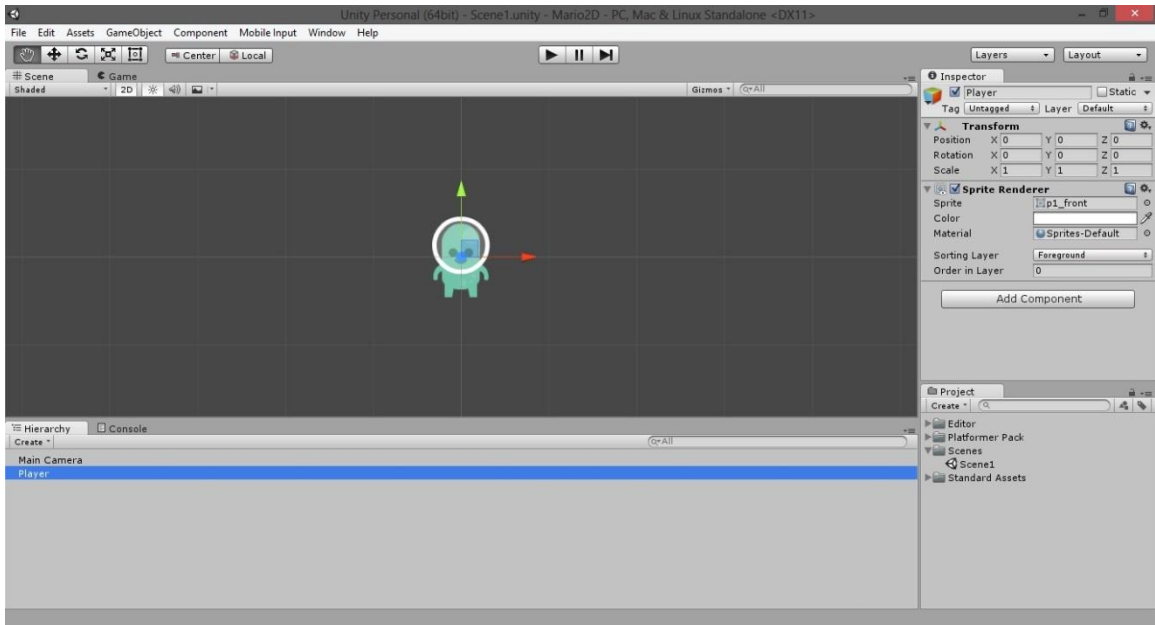


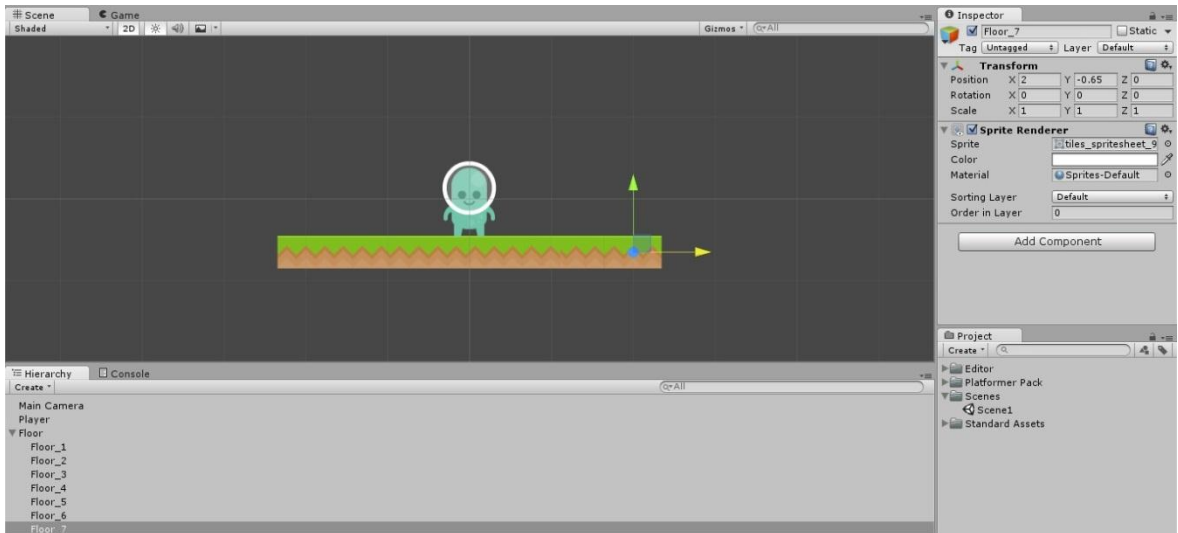
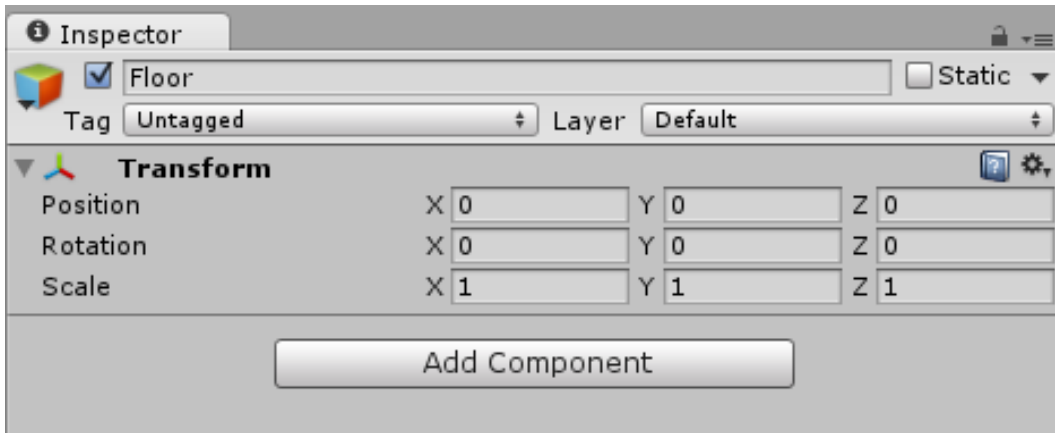




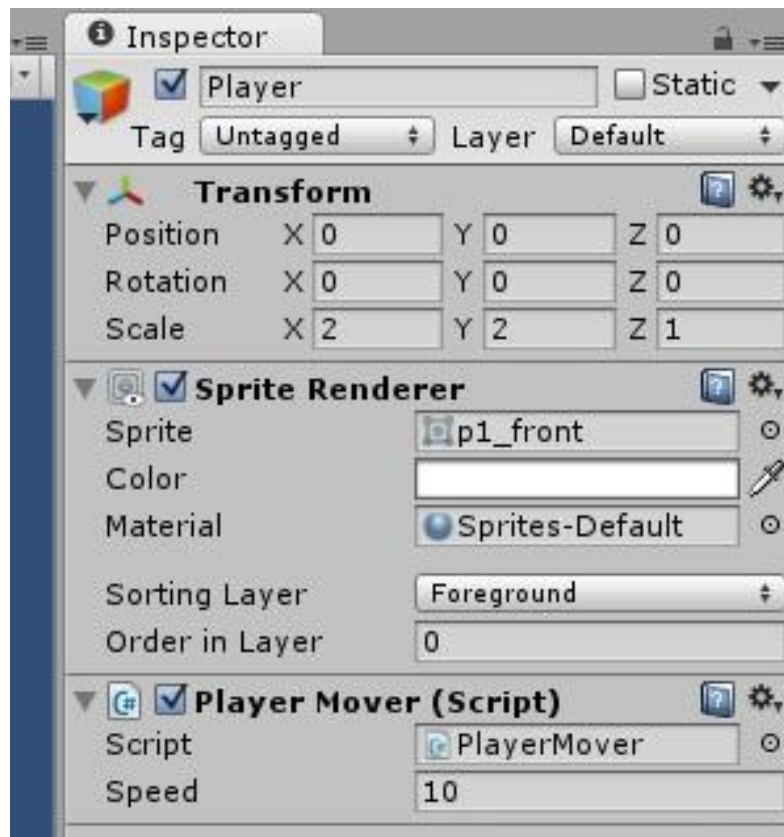


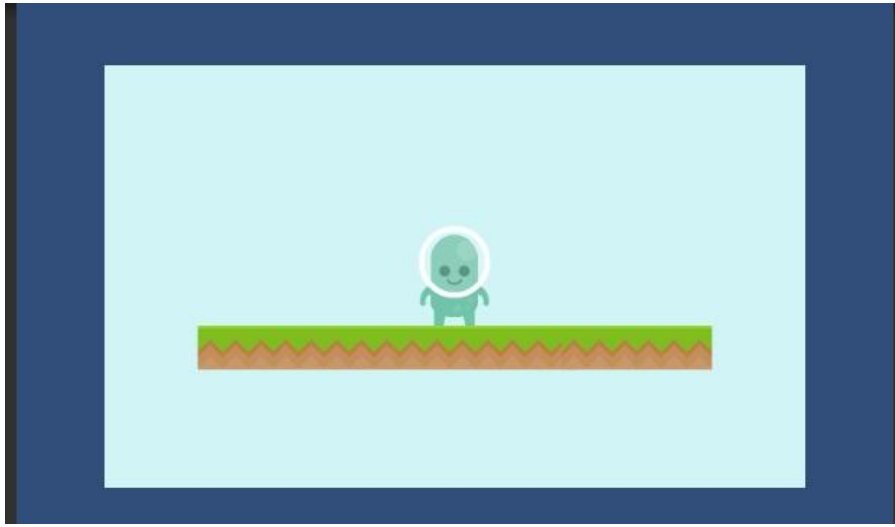




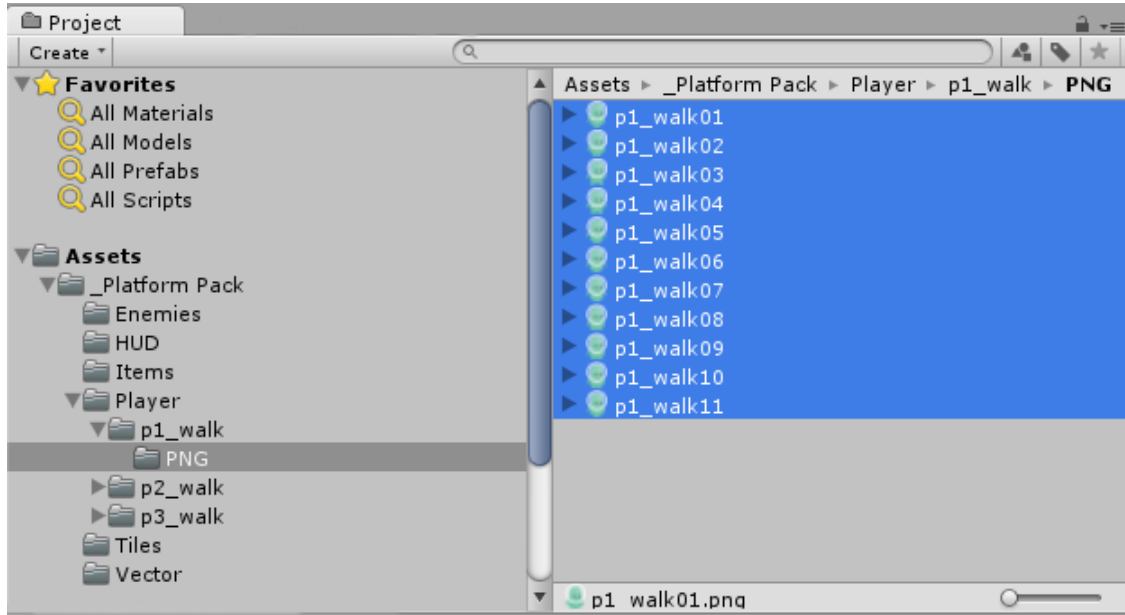


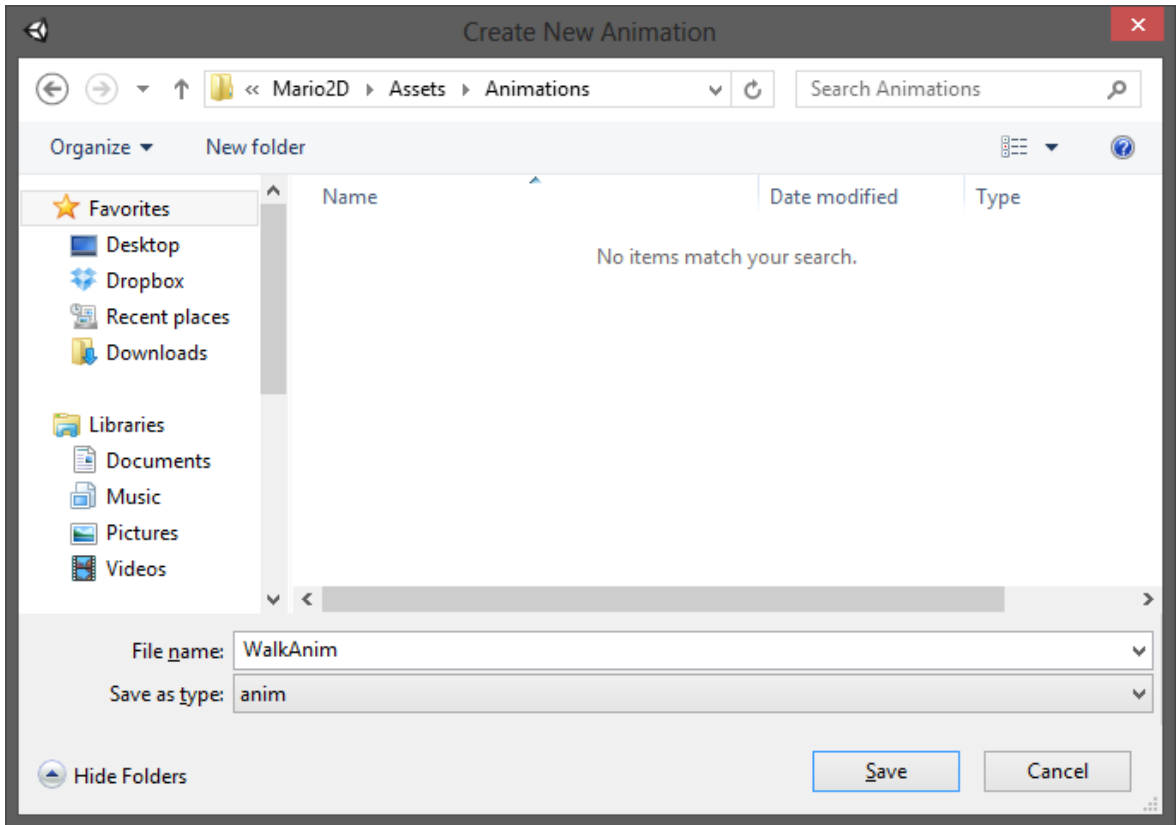






## Chapter 2: Animations





**Transform**

Position X 0 Y 0 Z 0  
Rotation X 0 Y 0 Z 0  
Scale X 1 Y 1 Z 1

**Sprite Renderer**

Sprite p1\_walk09  
Color  
Material Sprites-Default  
Sorting Layer Default  
Order in Layer 0

**Animator**

Controller PlayerAnimator  
Avatar None (Avatar)  
Apply Root Motion  
Update Mode Normal  
Culling Mode Always Animate

Animation

WalkAnim Sample 12

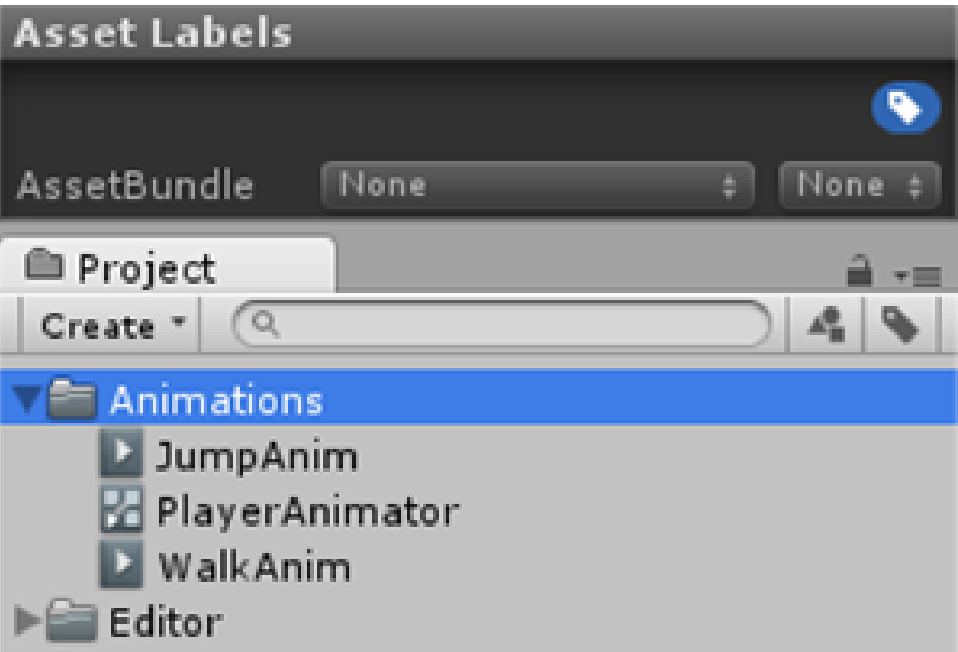
Player : Sprite

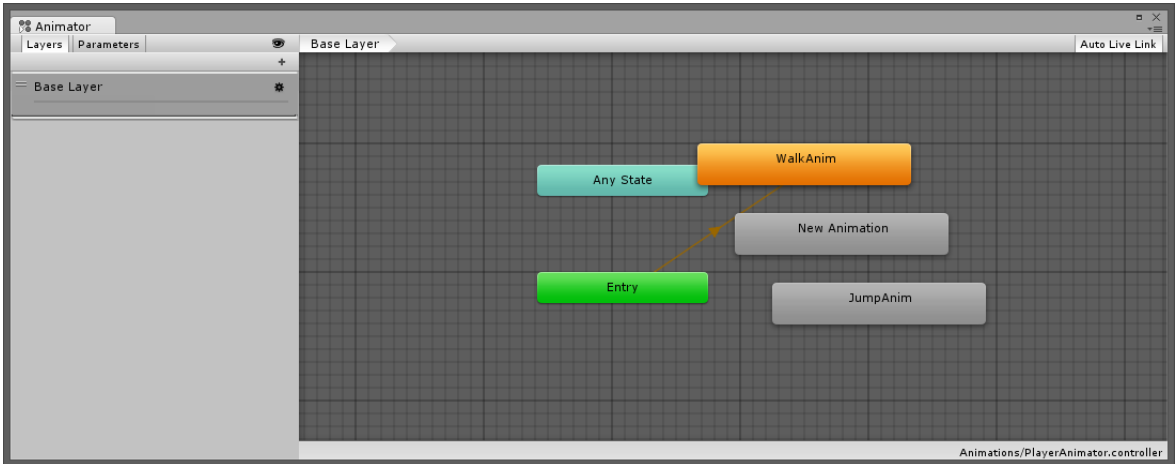
Add Property

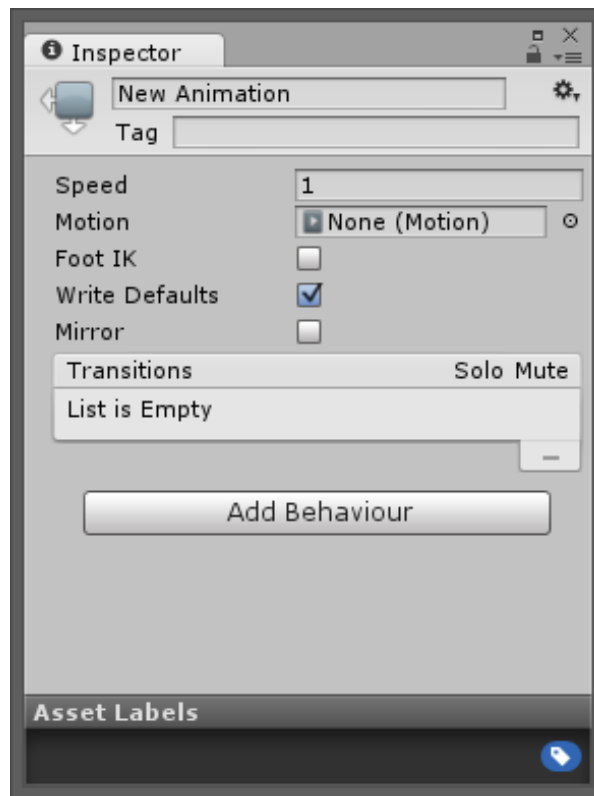
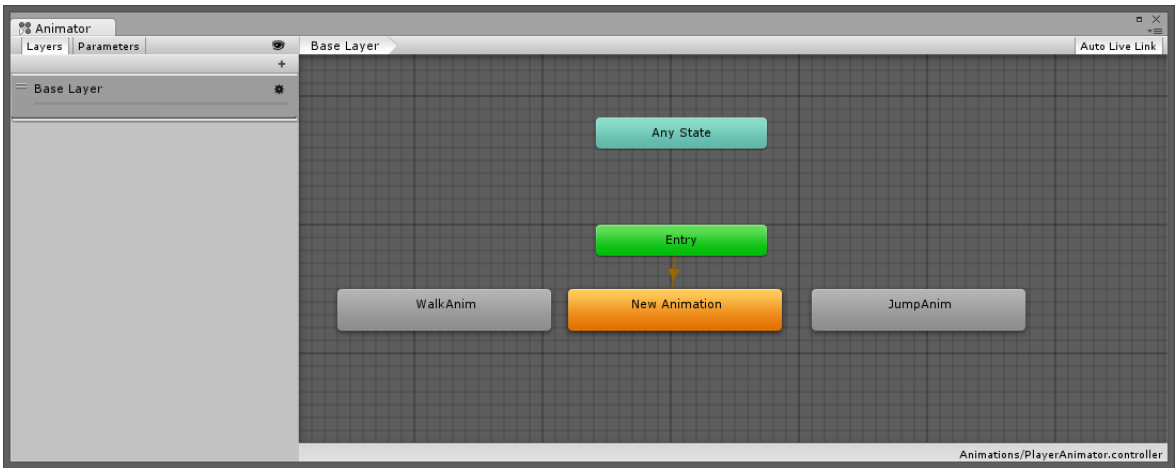
0:00 0:03 0:06 0:09 1:00 1:03 1:06 1:09 2:00

Dope Sheet Curves

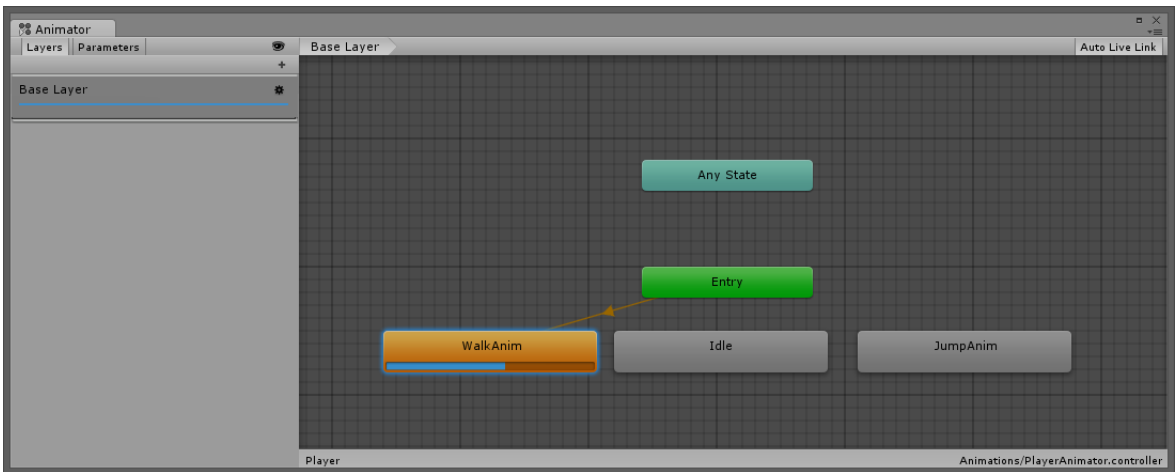
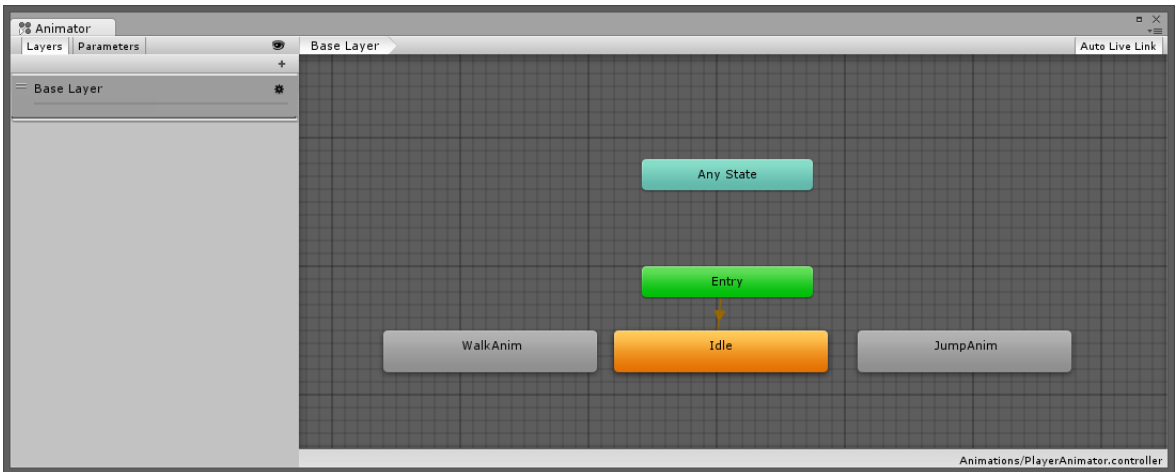
The screenshot shows an animation software interface. At the top, there's a title bar 'Animation' and a toolbar with play, stop, and other controls. Below that is a timeline with a numerical scale from 0:00 to 2:00. A track labeled 'WalkAnim' is visible, with a 'Sample 12' indicator. Below the timeline, there's a section for 'Player : Sprite' with an 'Add Property' button. The main area of the interface is a grid where keyframes are represented by diamond markers along vertical lines. The markers are present from 0:00 to 0:09. At the bottom, there are tabs for 'Dope Sheet' and 'Curves'.

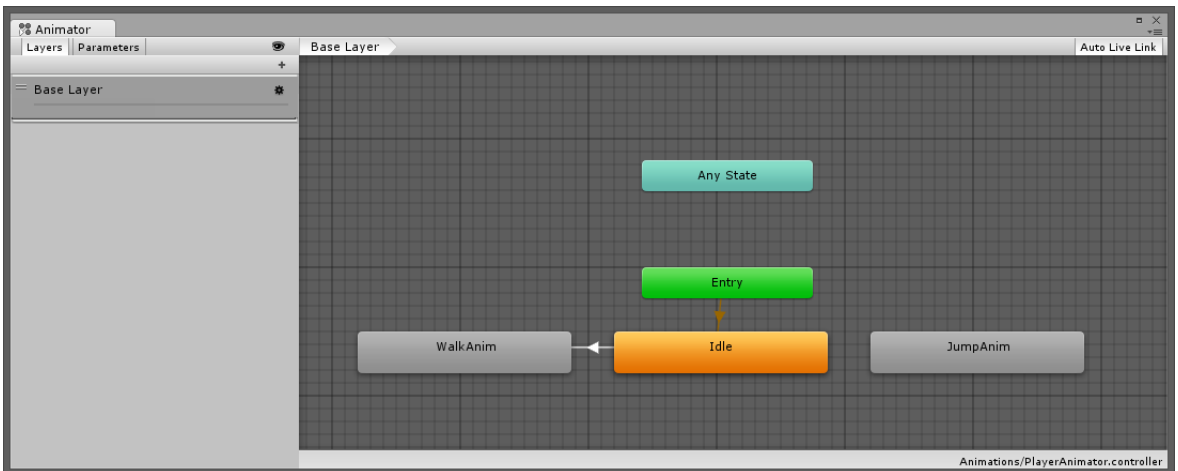
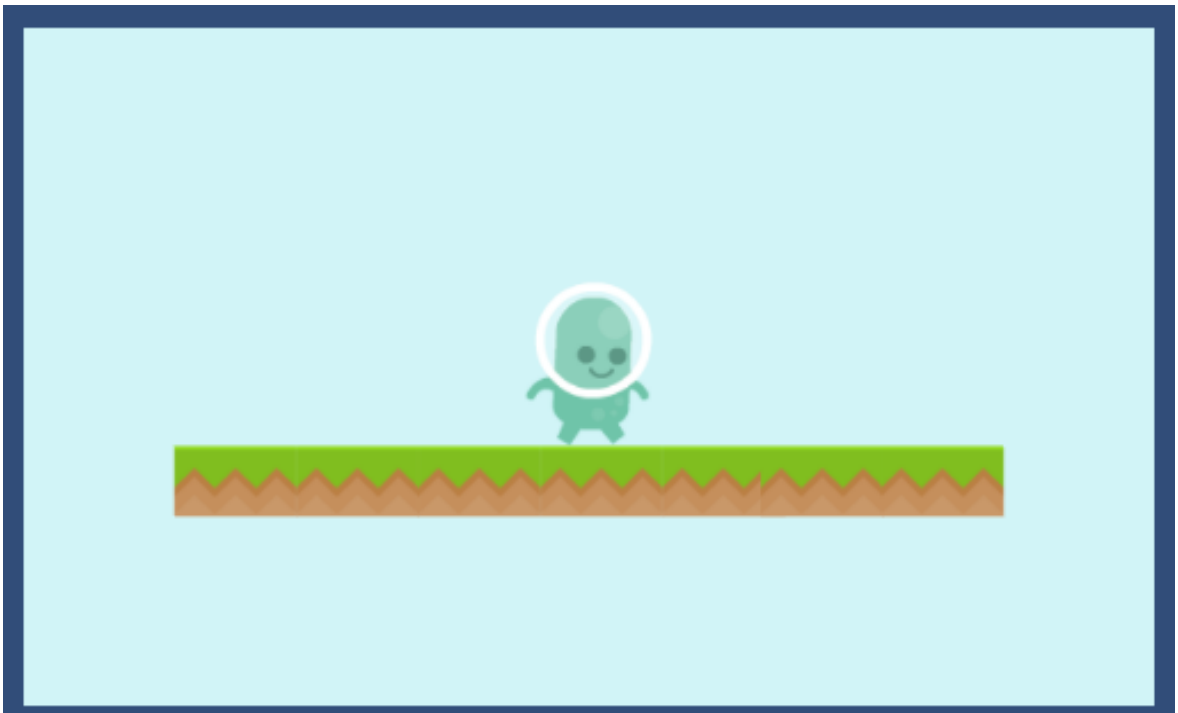


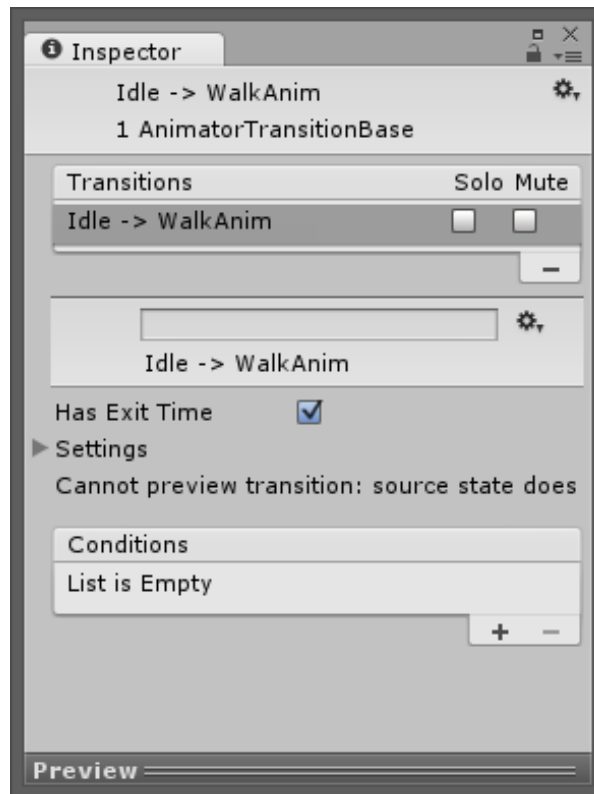


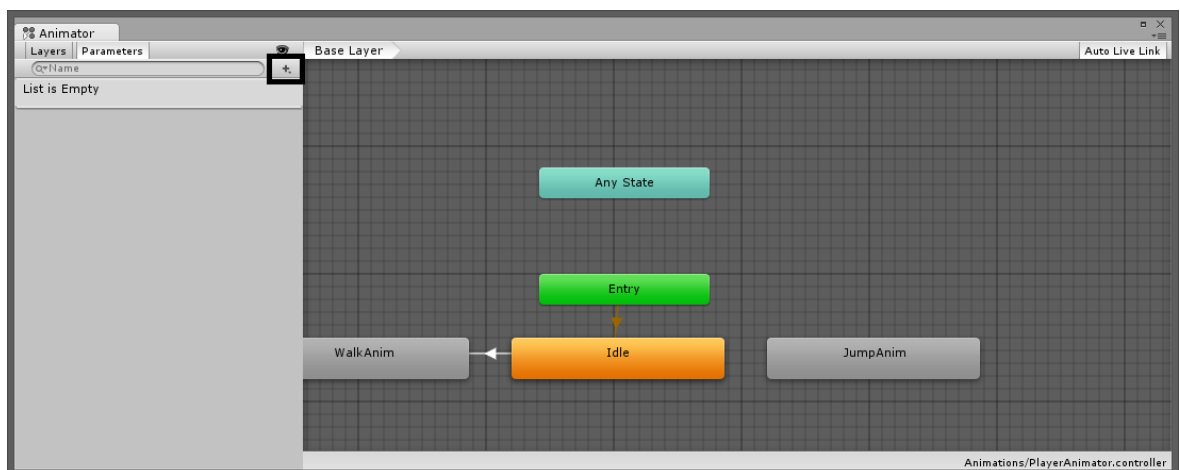
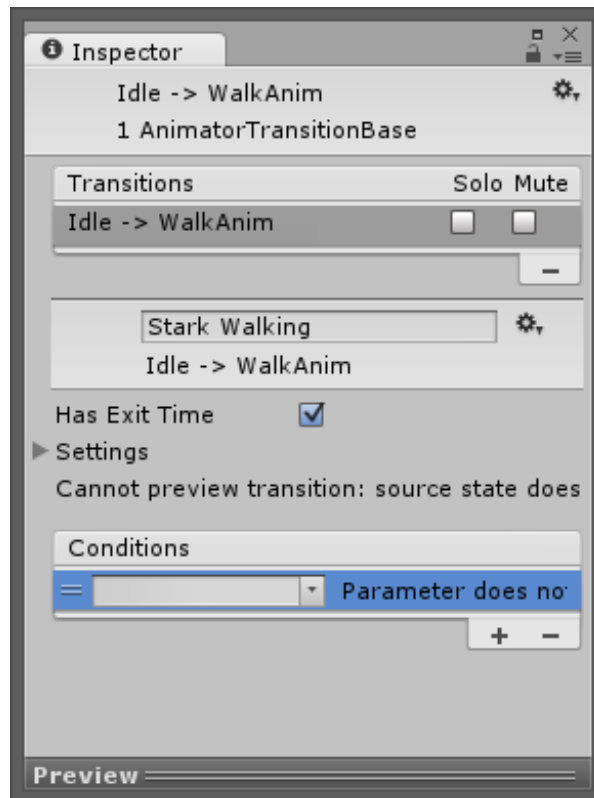


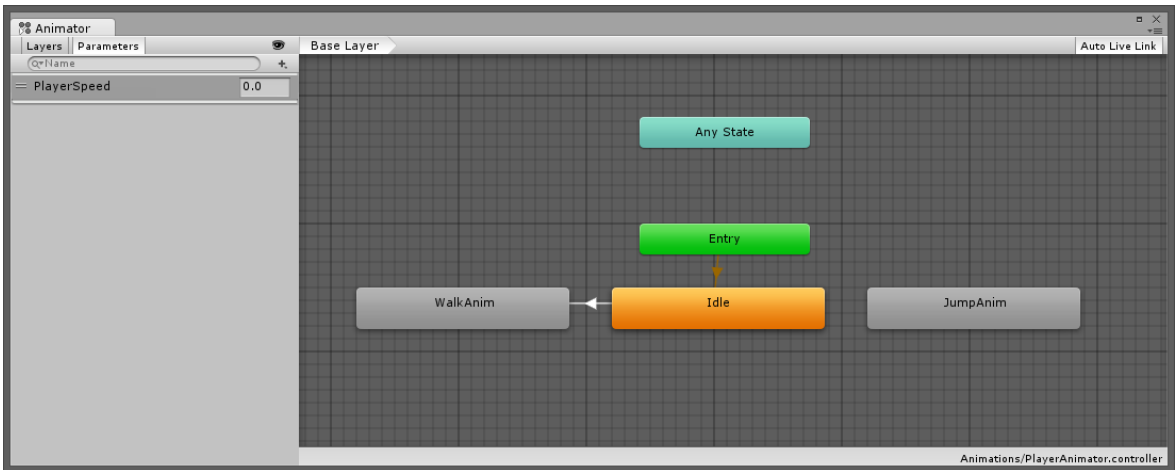




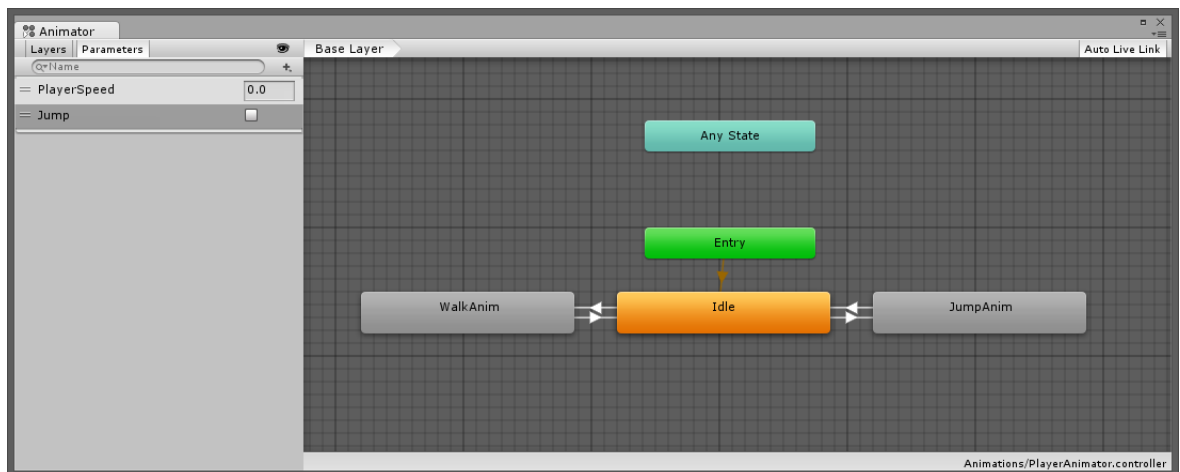
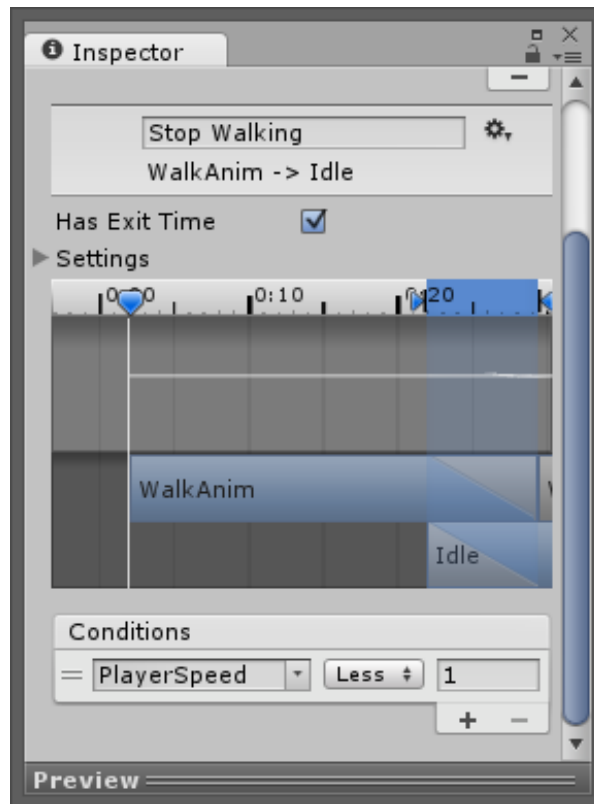


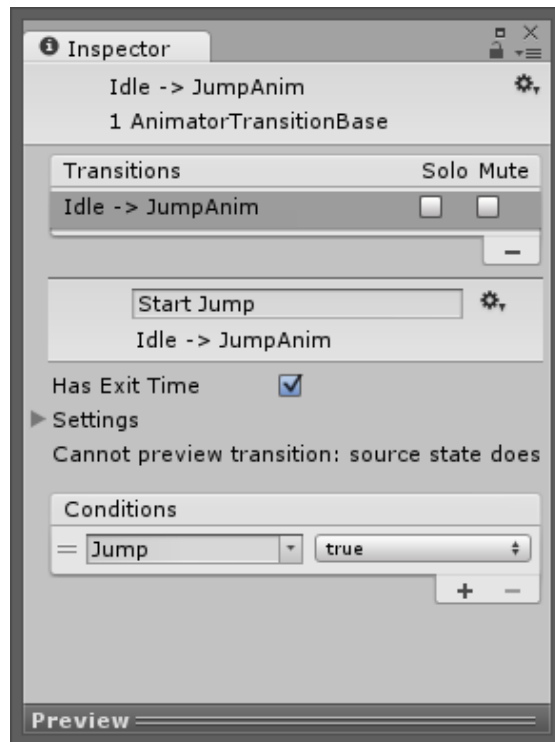


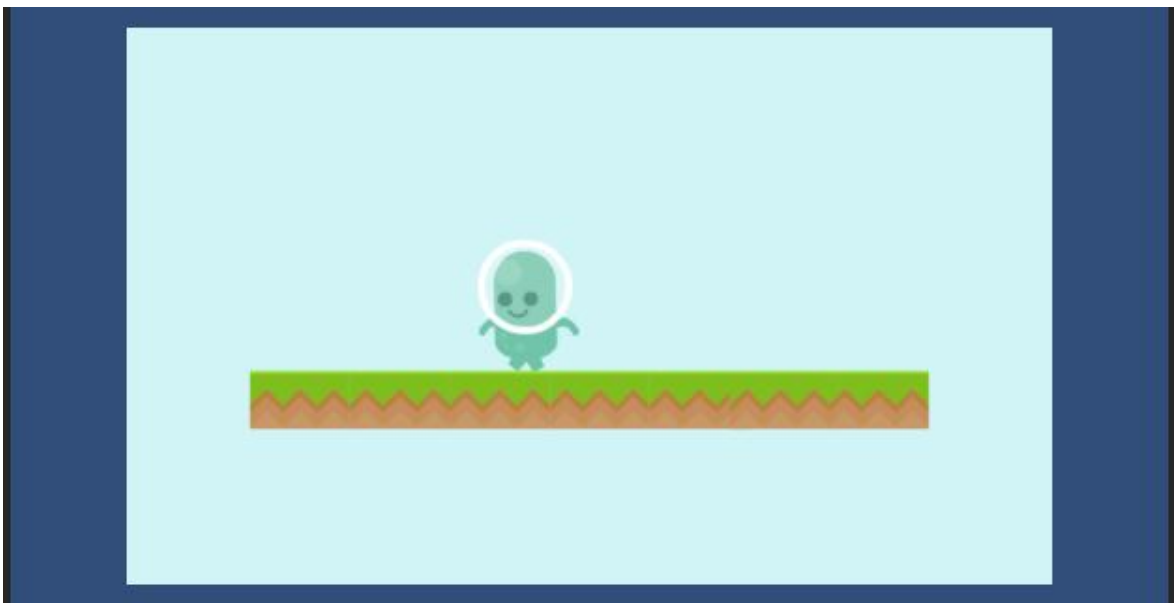
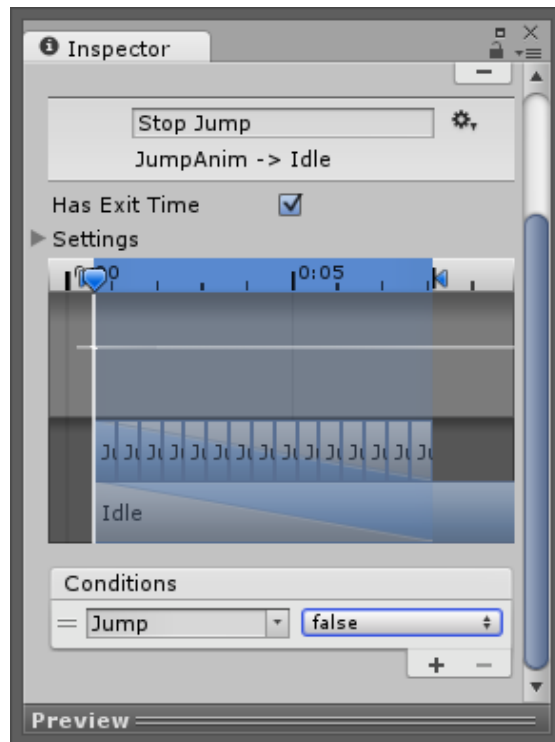




The screenshot shows the Unity Inspector window for an AnimatorTransitionBase component. The component name is 'Stark Walking'. Below the name, it lists '1 AnimatorTransitionBase'. The 'Transitions' section shows a list with one entry: 'Stark Walking', which has two checkboxes (Solo and Mute) and a minus sign. Below this is a field for the transition name, currently set to 'Stark Walking'. The 'Has Exit Time' checkbox is checked. The 'Settings' section is collapsed, showing a message: 'Cannot preview transition: source state does:'. The 'Conditions' section shows a dropdown menu set to 'PlayerSpeed', a comparison operator 'Greater+', and a value of '0'. There are plus and minus buttons next to the value field. At the bottom, there is a 'Preview' section.



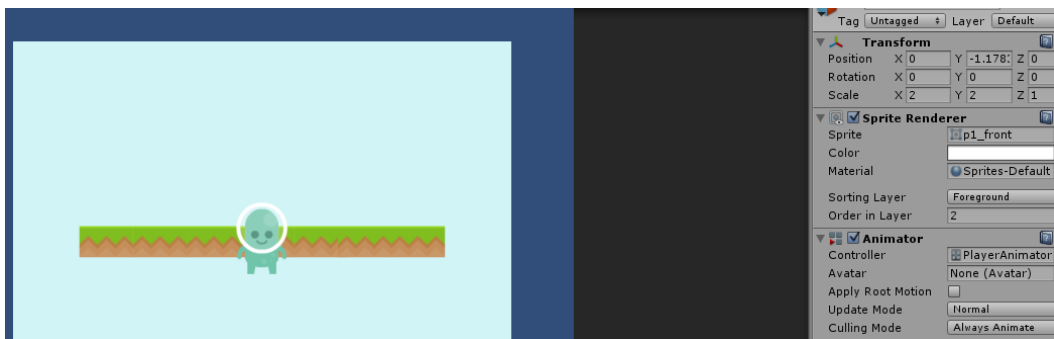
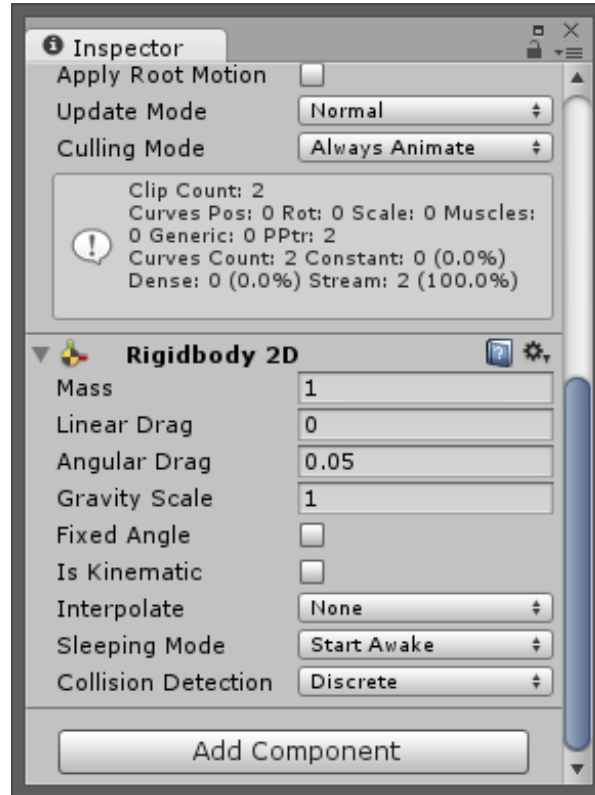


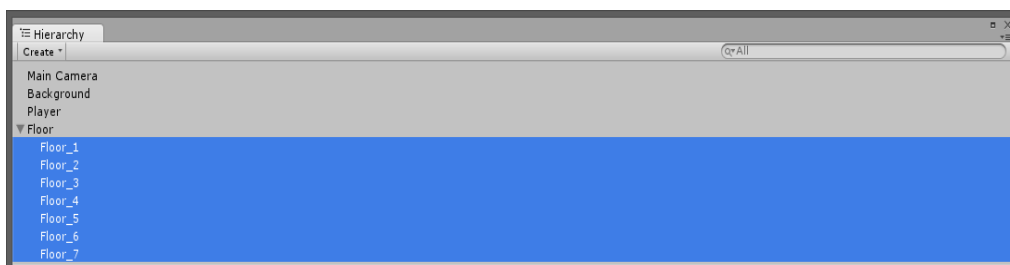
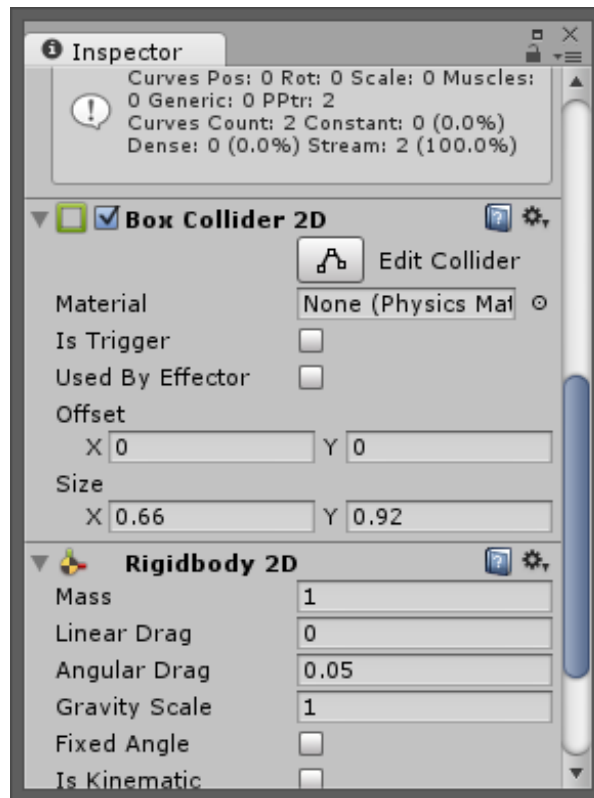


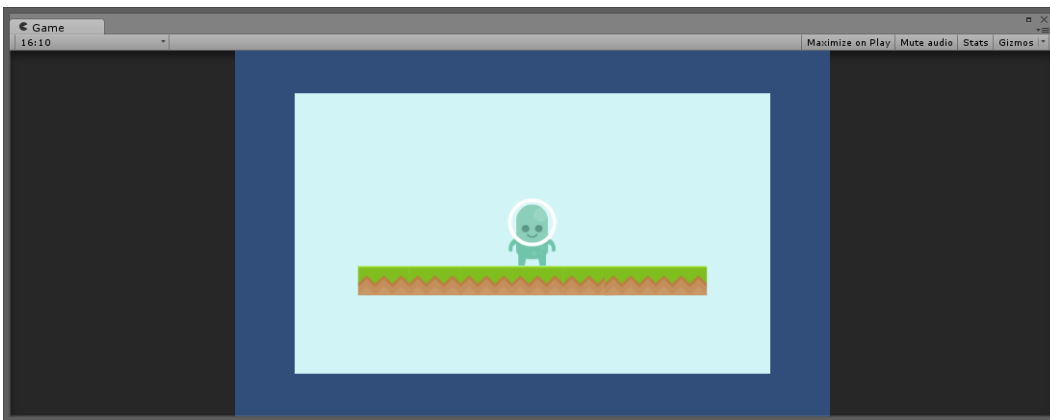
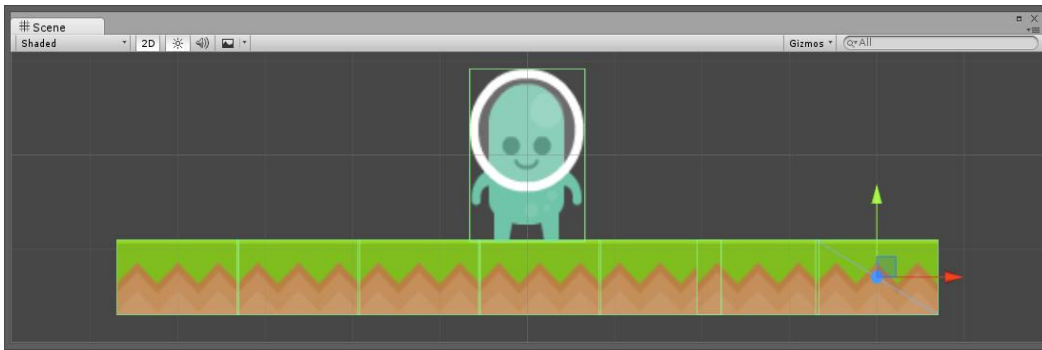


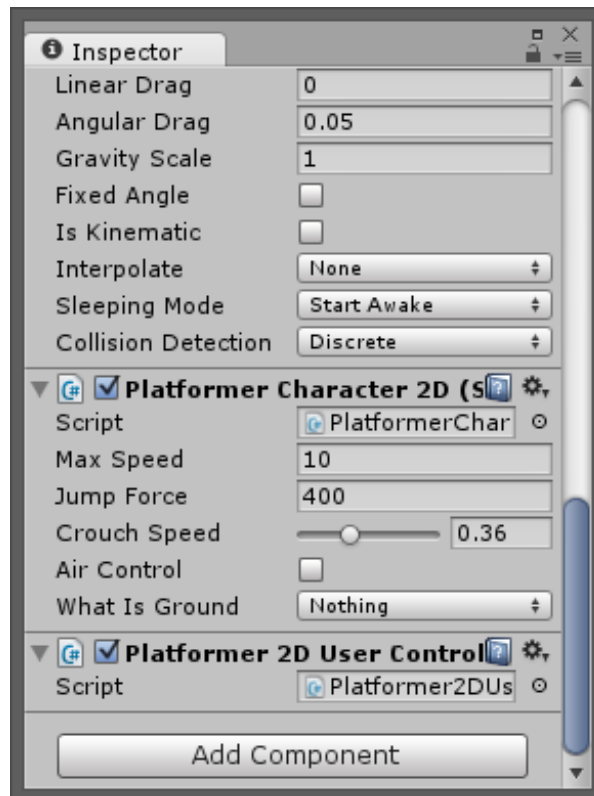


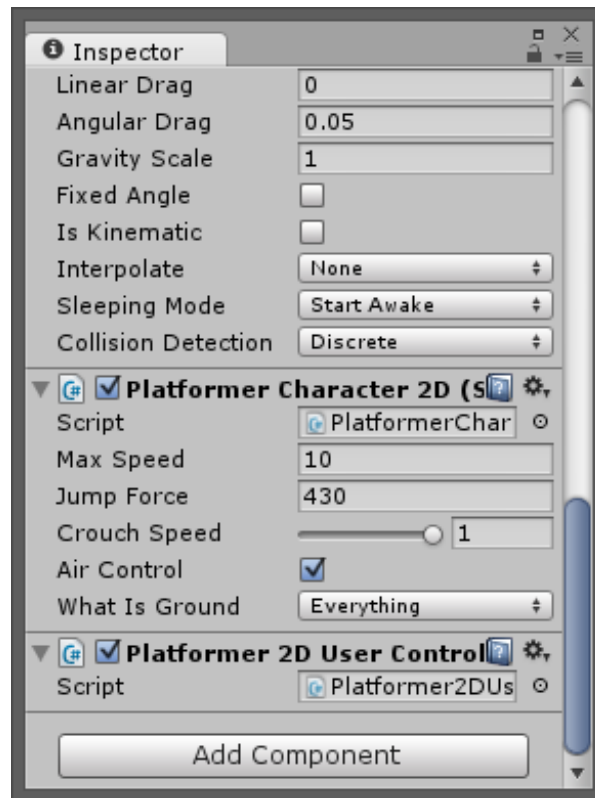
## Chapter 3: Physics



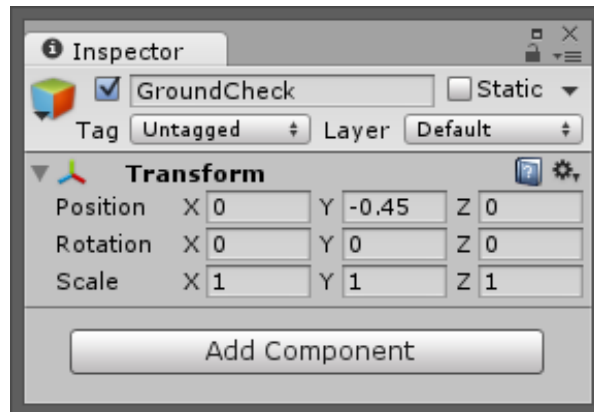
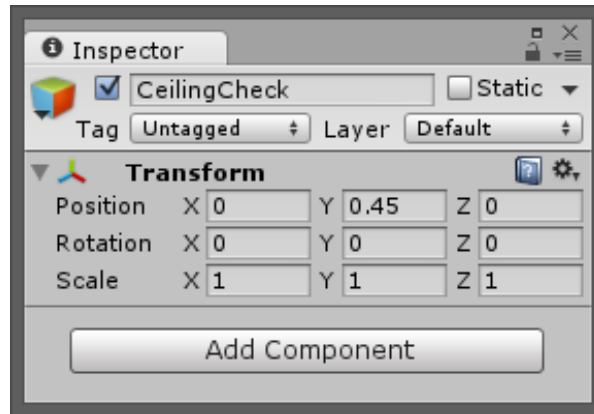


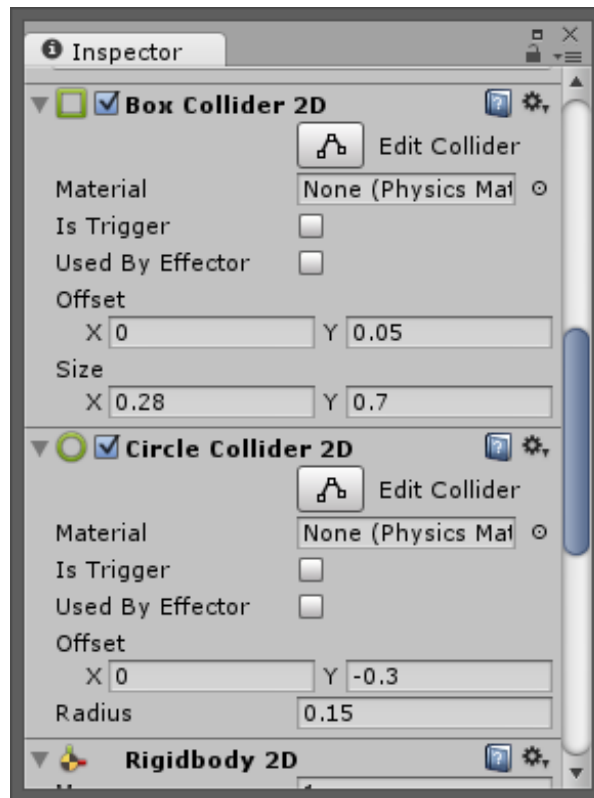




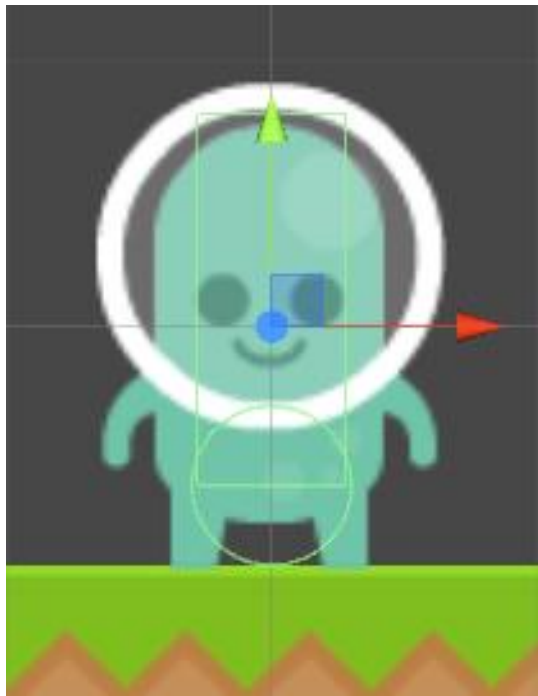


▼ Player  
CeilingCheck  
GroundCheck

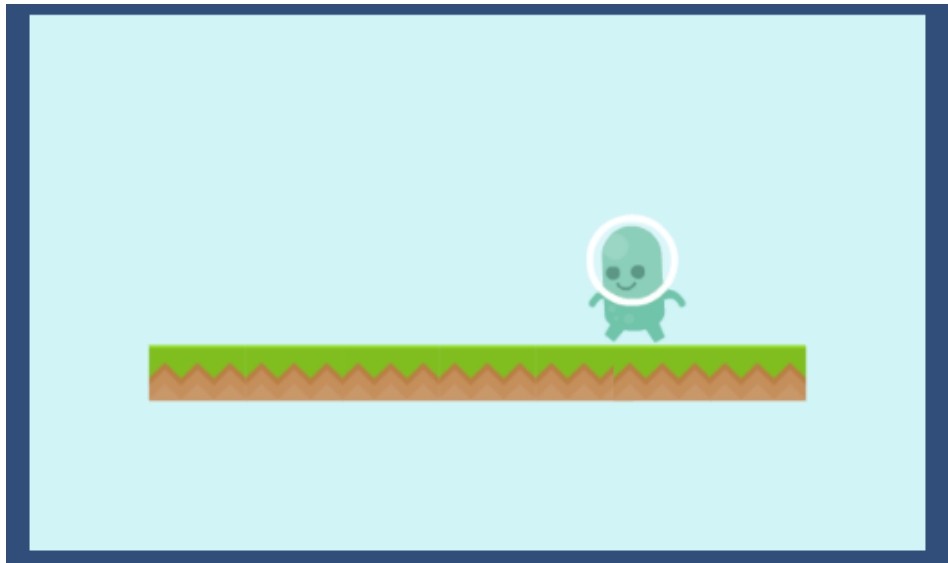
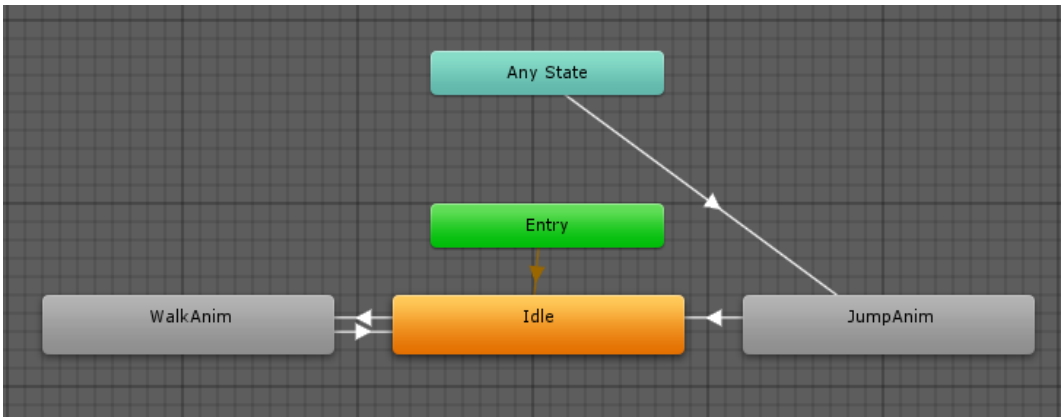


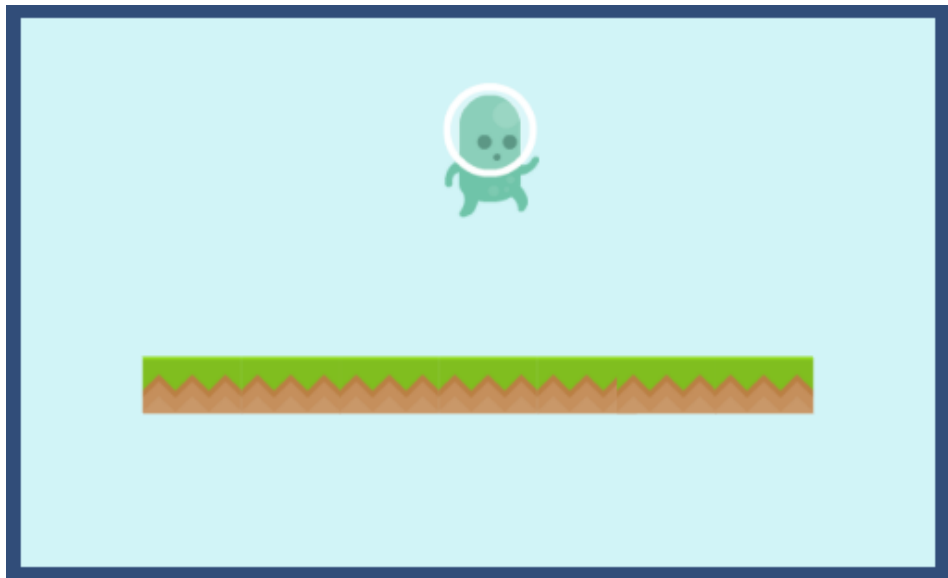




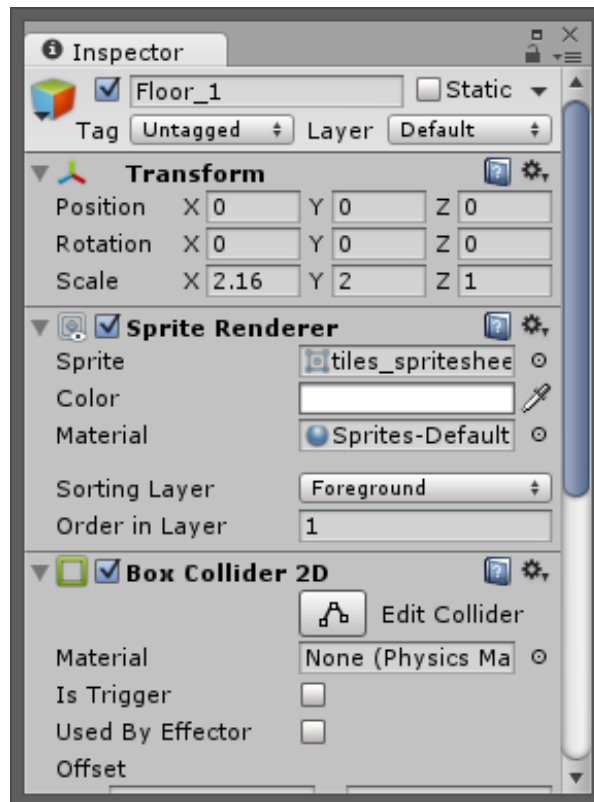


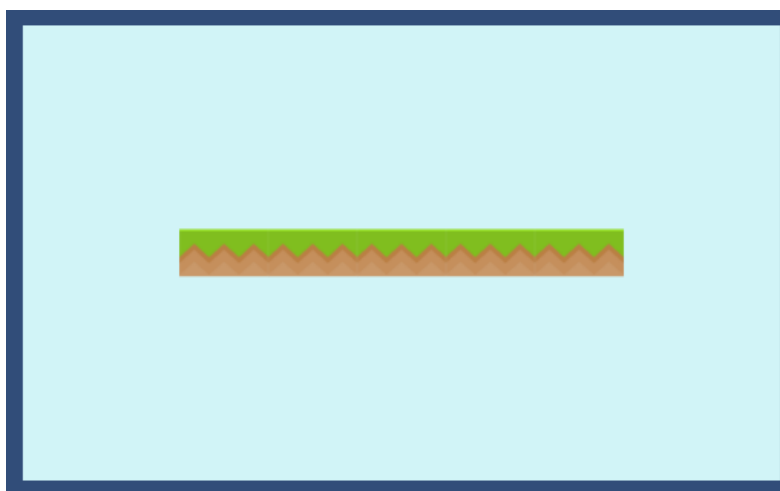
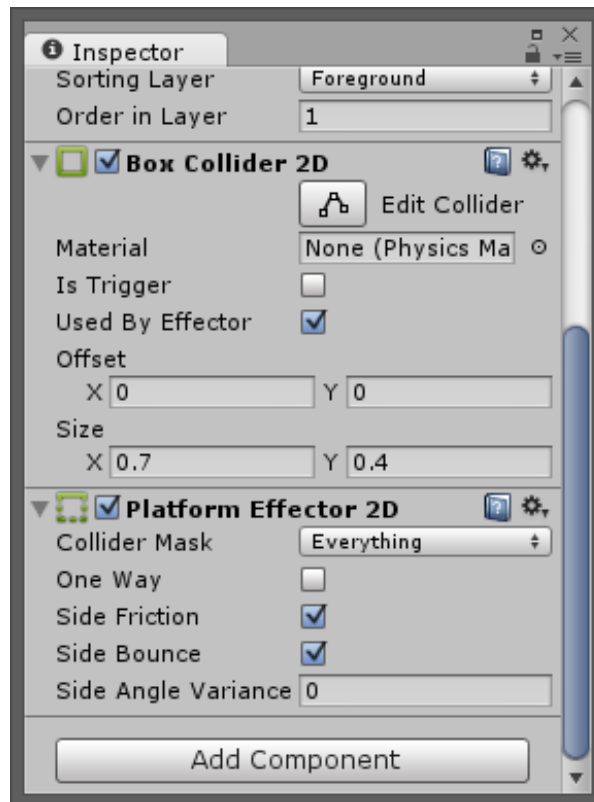
Layers	Parameters	
Q Name		
Speed		0.0
Ground		<input type="checkbox"/>
Crouch		<input type="checkbox"/>
vSpeed		0.0





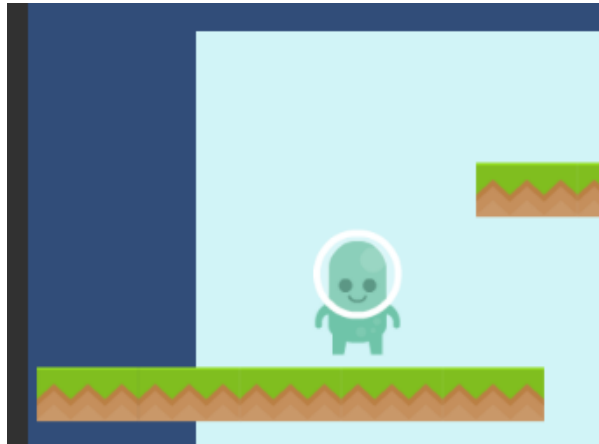
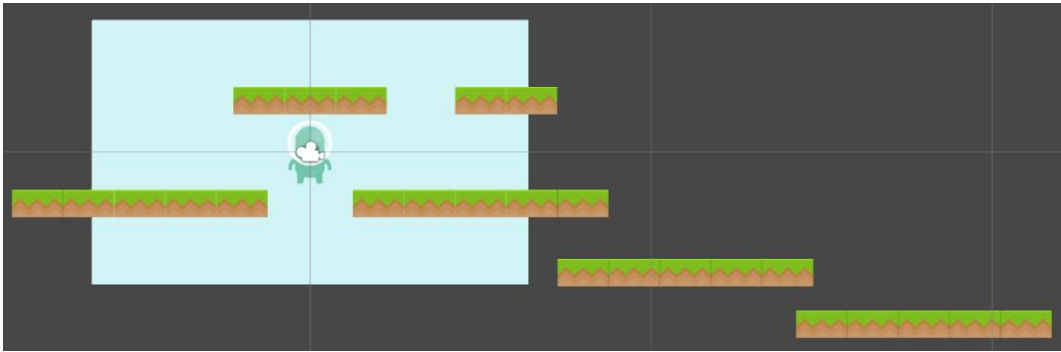
```
▼ Floor  
  ▼ Floors_1  
    Floor_1
```

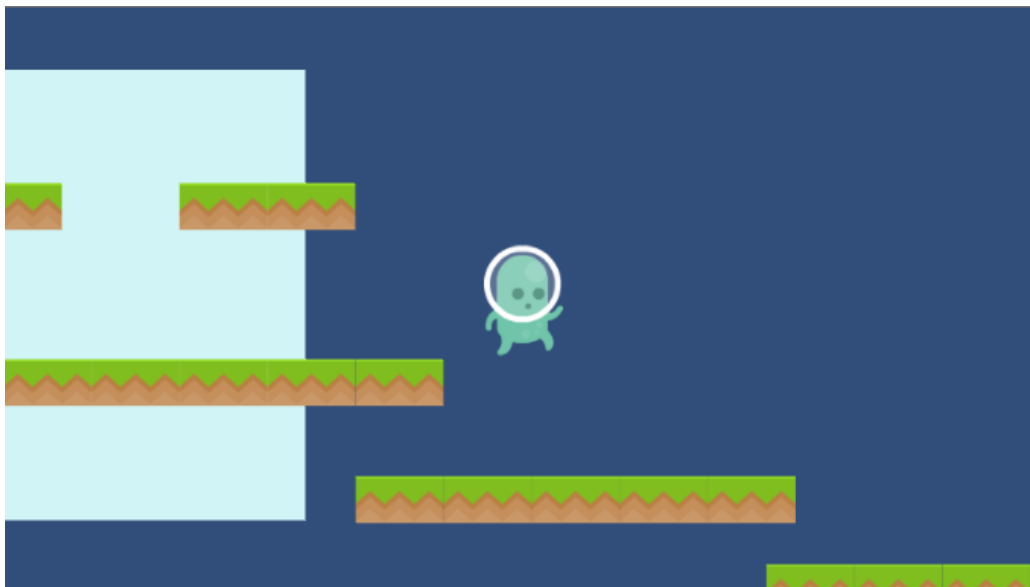
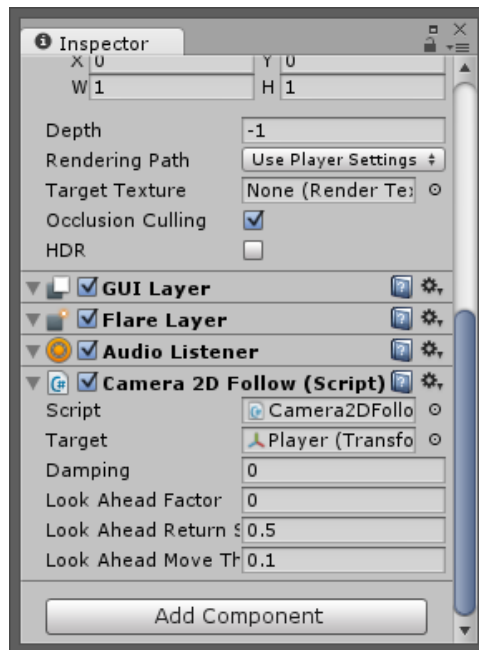




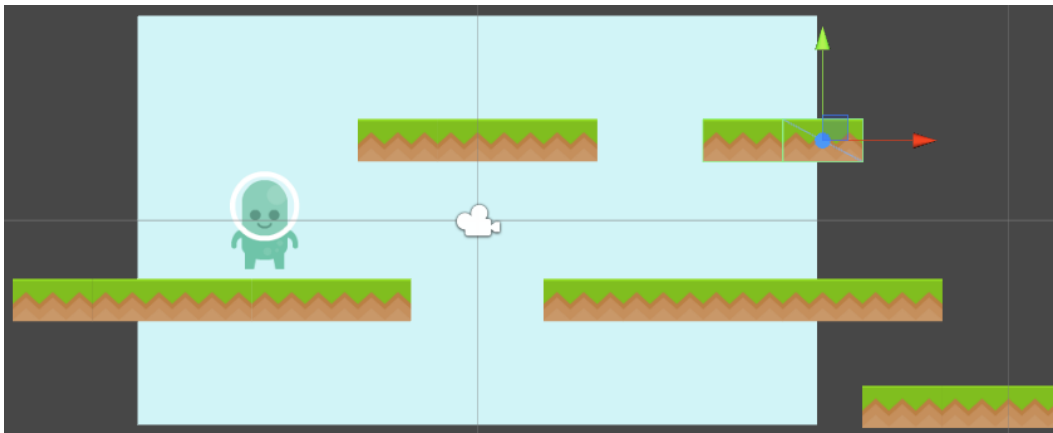
- ▼ Floor
  - ▼ Floors\_1
    - Floor\_1
    - Floor\_2
    - Floor\_3
    - Floor\_4
    - Floor\_5











Inspector

Sorting Layer:

Order in Layer:

**Box Collider 2D**

Material:

Is Trigger:

Used By Effector:

Offset

X:  Y:

Size

X:  Y:

**Platform Effector 2D**

Collider Mask:

One Way:

Side Friction:

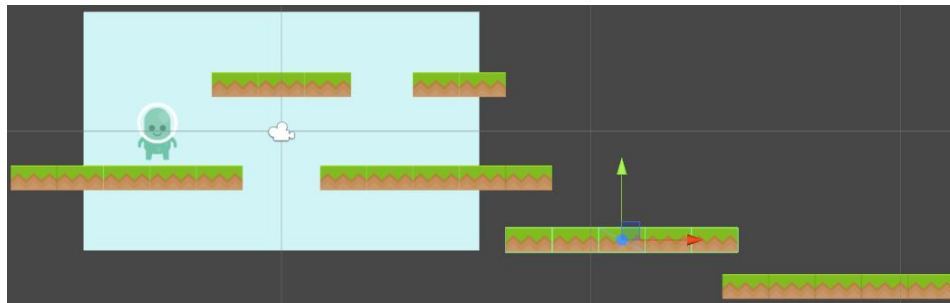
Side Bounce:

Side Angle Variance:

Player

Floor

- Floors\_1
- Floors\_2
- Floors\_3
- Floors\_4
- Floor\_1**
- Floor\_2**
- Floors\_5
- Floors\_6



Inspector

- ▶ Player
- ▼ Floor
  - ▶ Floors\_1
  - ▶ Floors\_2
  - ▶ Floors\_3
  - ▶ Floors\_4
  - ▼ Floors\_5
    - Floor\_1
    - Floor\_2
    - Floor\_3
    - Floor\_4
    - Floor\_5
  - ▶ Floors\_6

Inspector

Material: Sprites-Default

Sorting Layer: Foreground

Order in Layer: 1

Box Collider 2D

Material: Slippery

Is Trigger:

Used By Effector:

Offset: X 0 Y 0

Size: X 0.7 Y 0.4

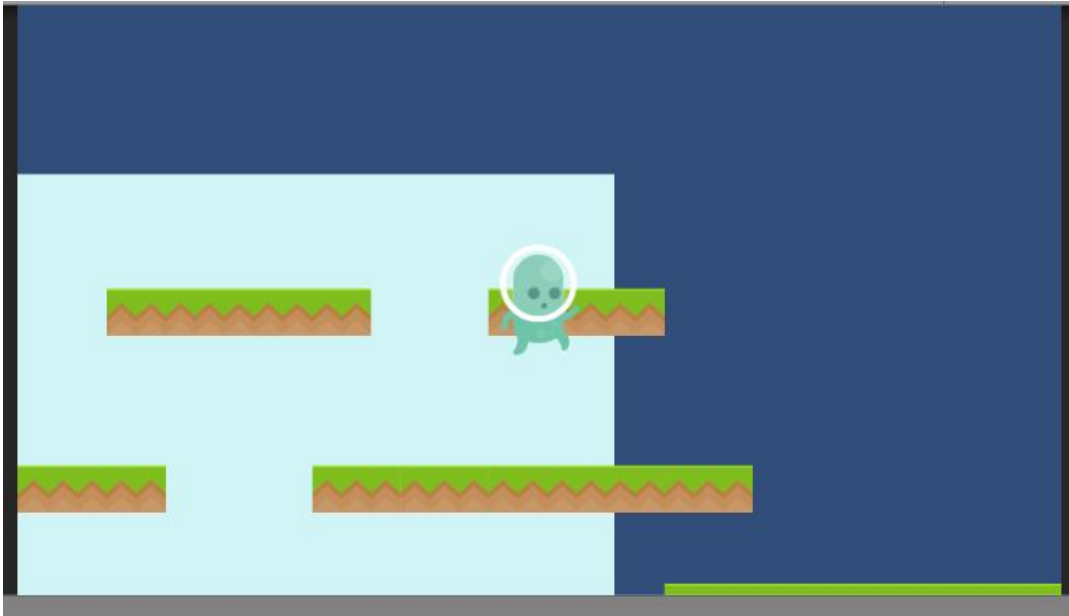
Surface Effector 2D

Collider Mask: Everything

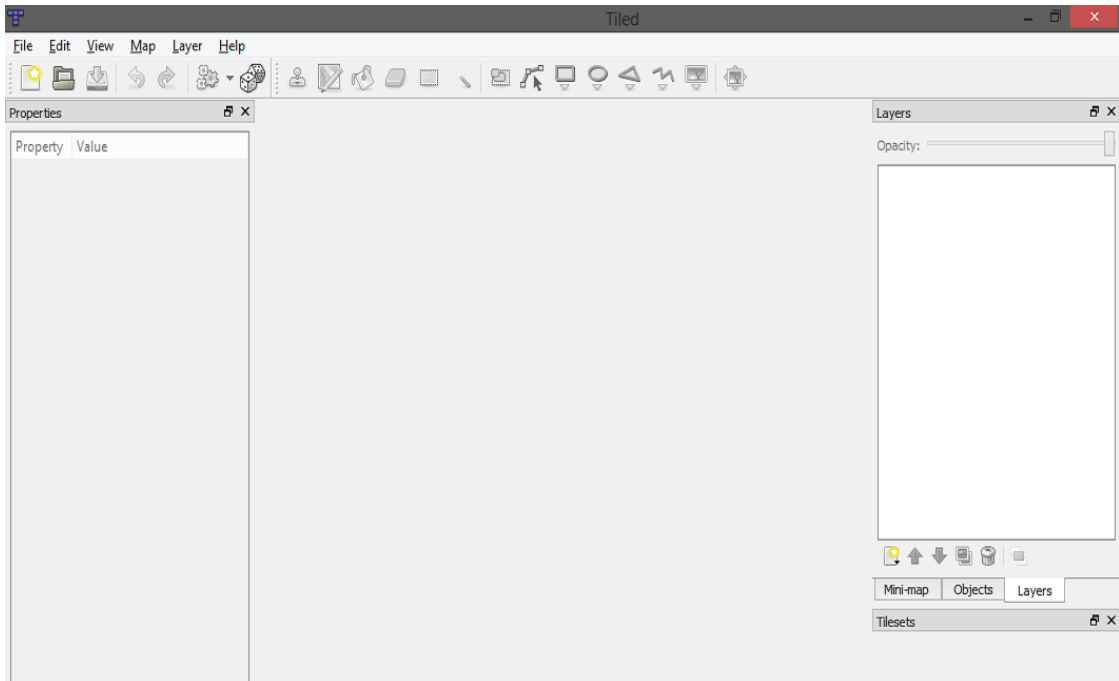
Speed: 5

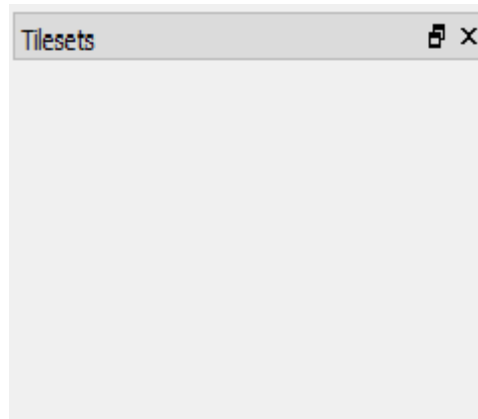
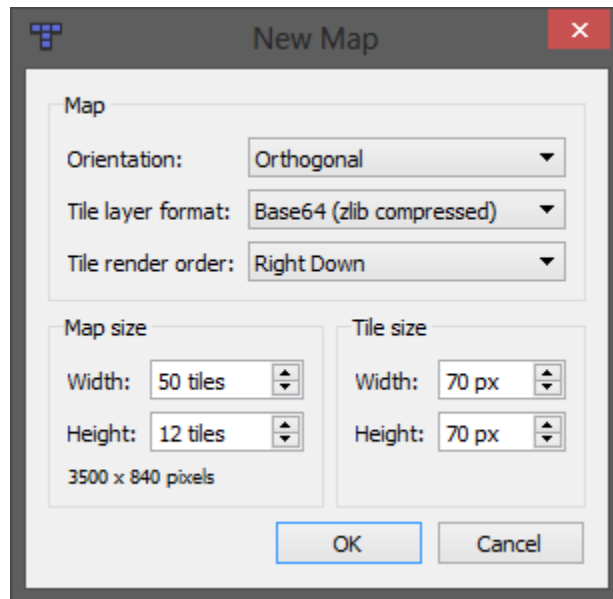
Speed Variation: 0

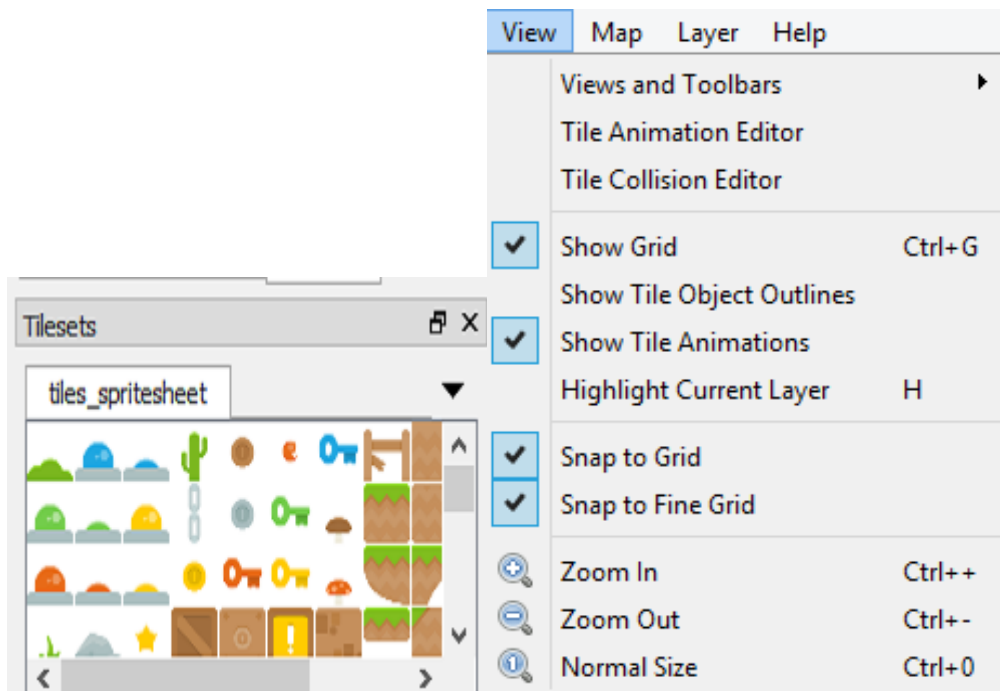
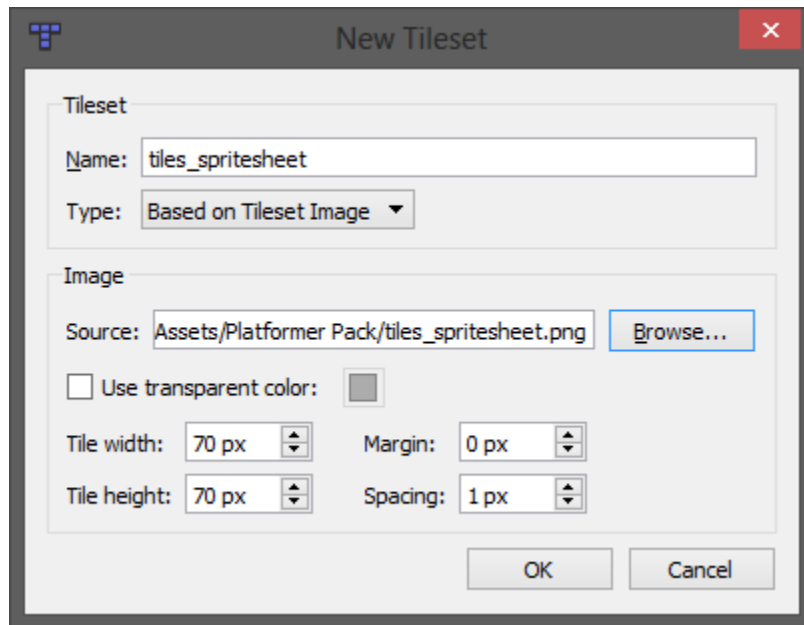
Add Component

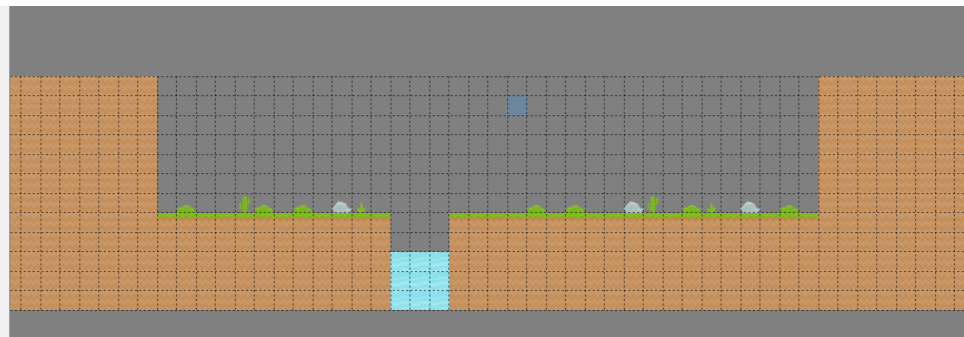
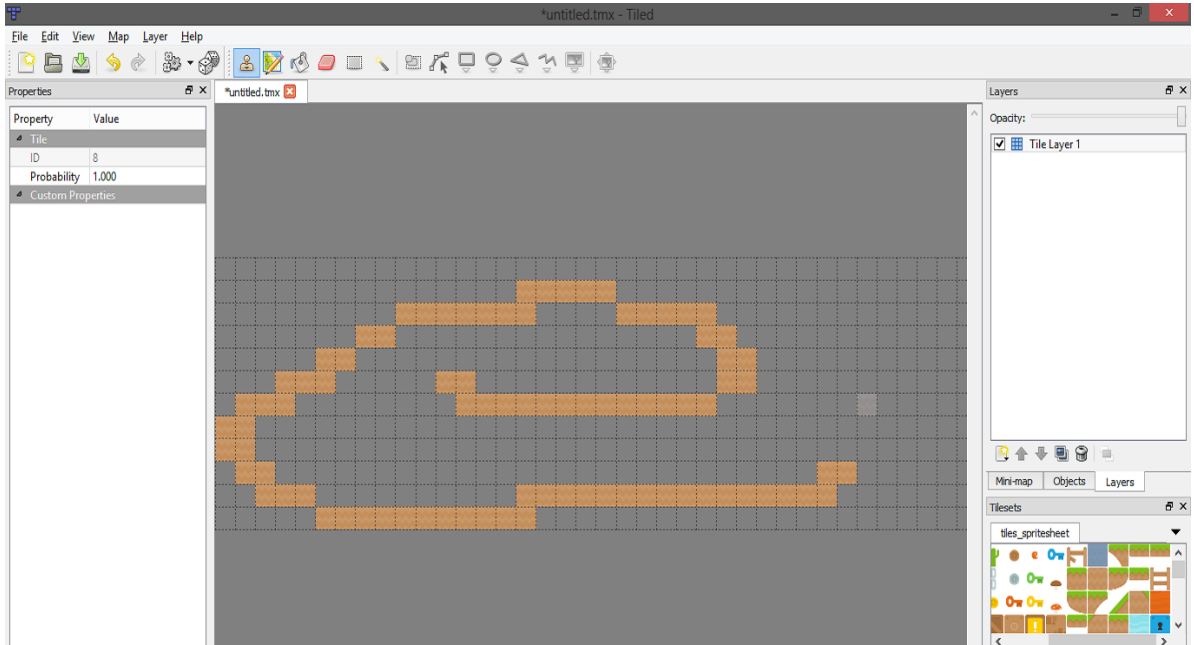


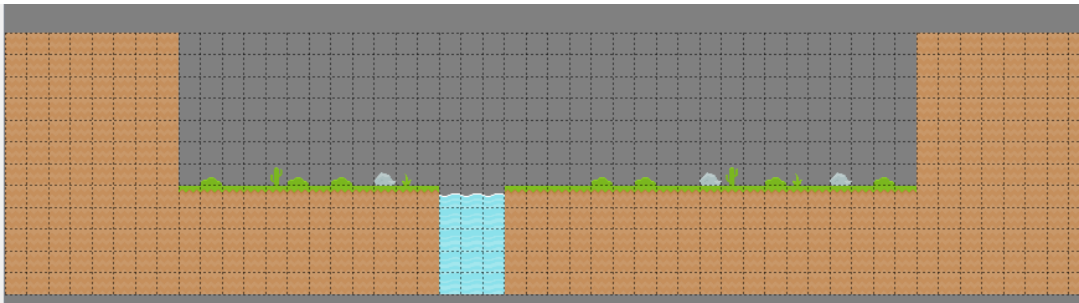
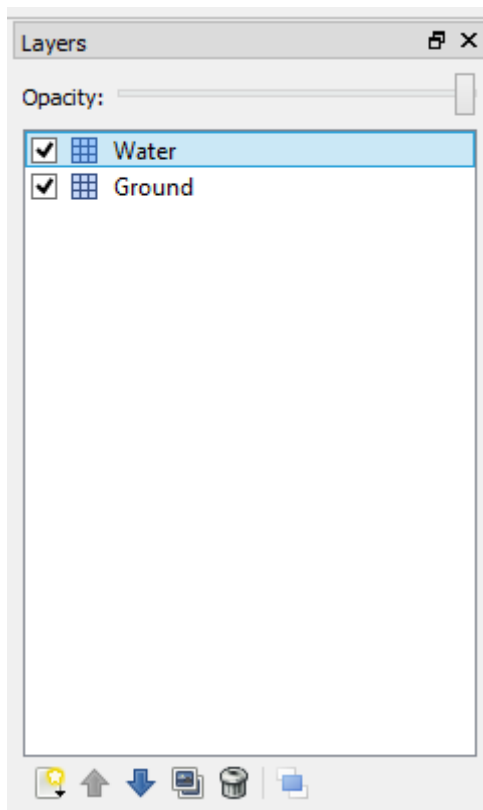
## Chapter 4: Level Design







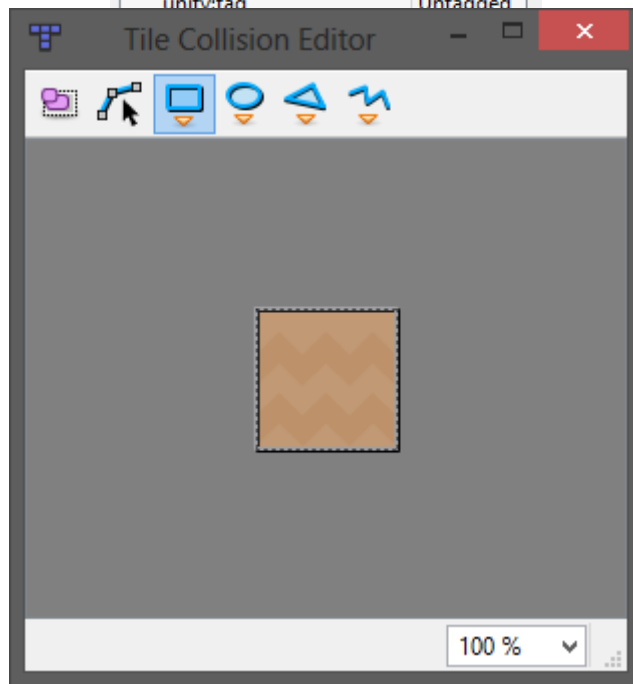


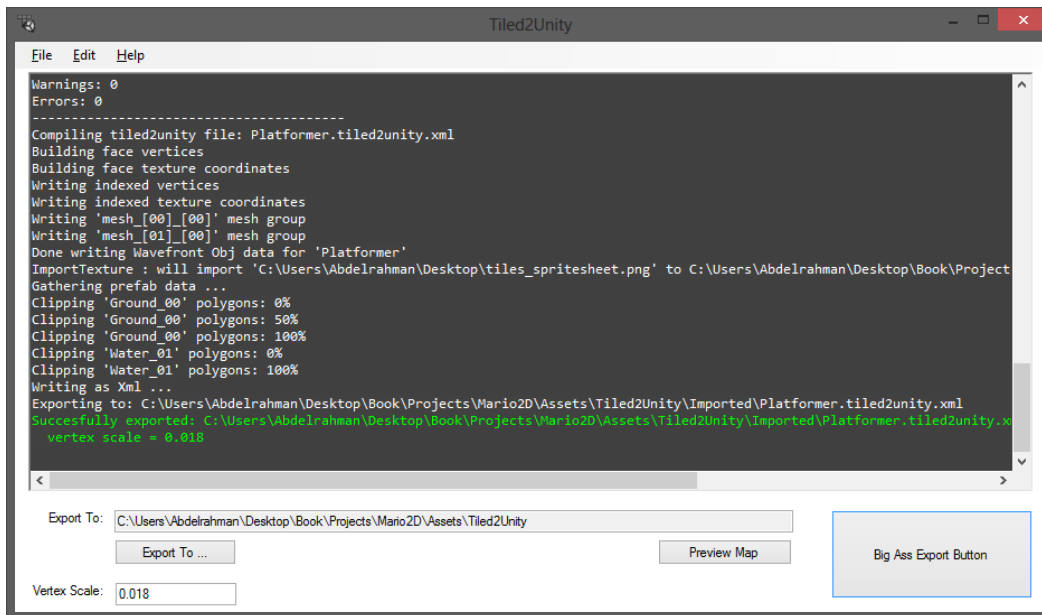
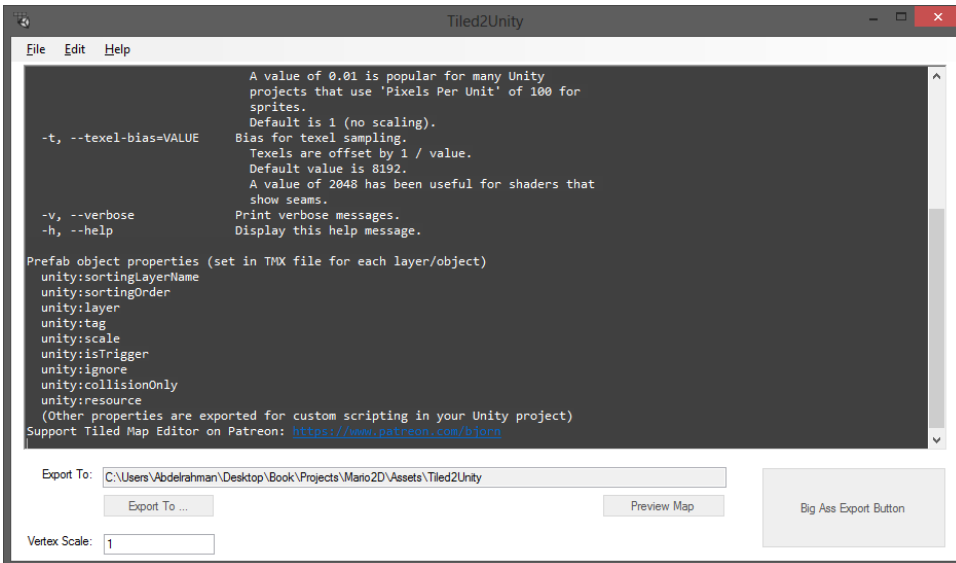


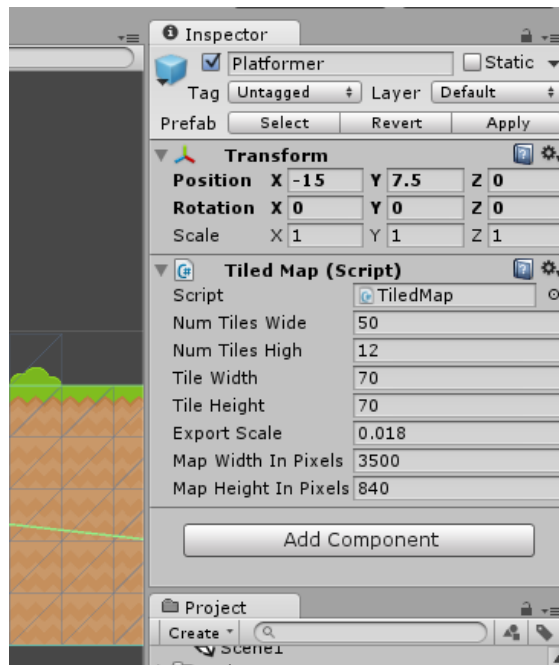
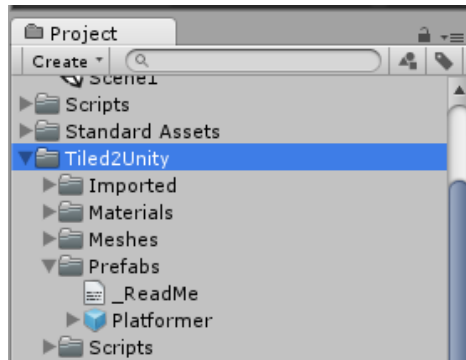


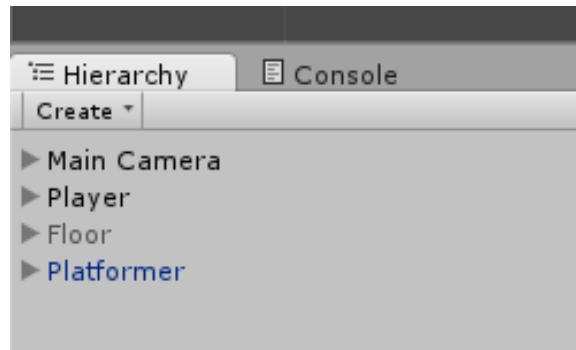
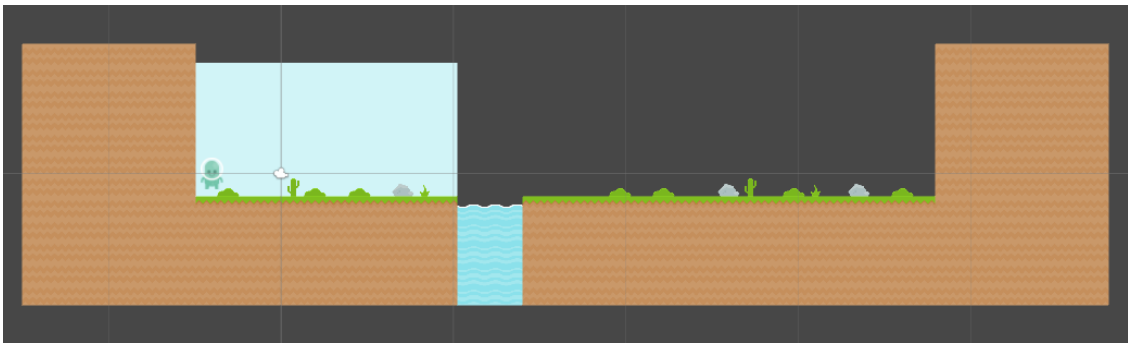
Properties

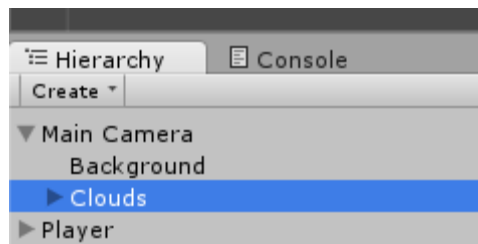
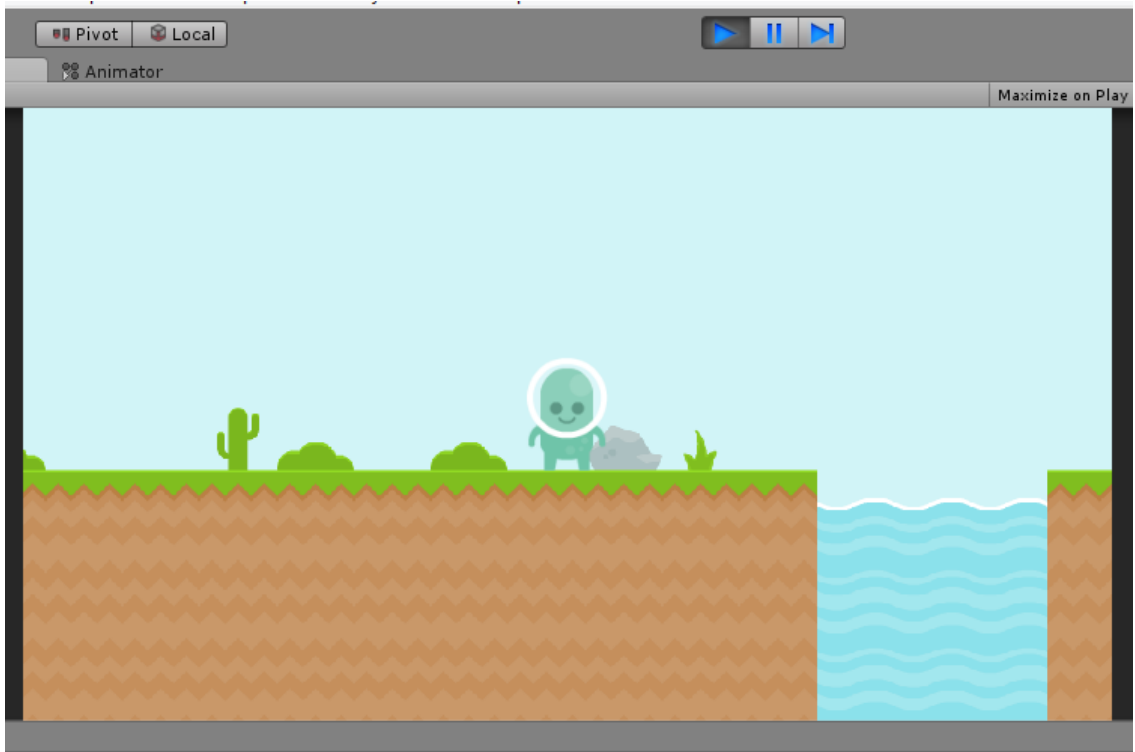
Property	Value
Tile Layer	
Name	Ground
Visible	<input checked="" type="checkbox"/>
Opacity	1.00
Custom Properties	
unity:isTrigger	false
unity:layer	Default
unity:sortingLayerName	Foreground
unity:sortingOrder	0
unity:tag	Untagged

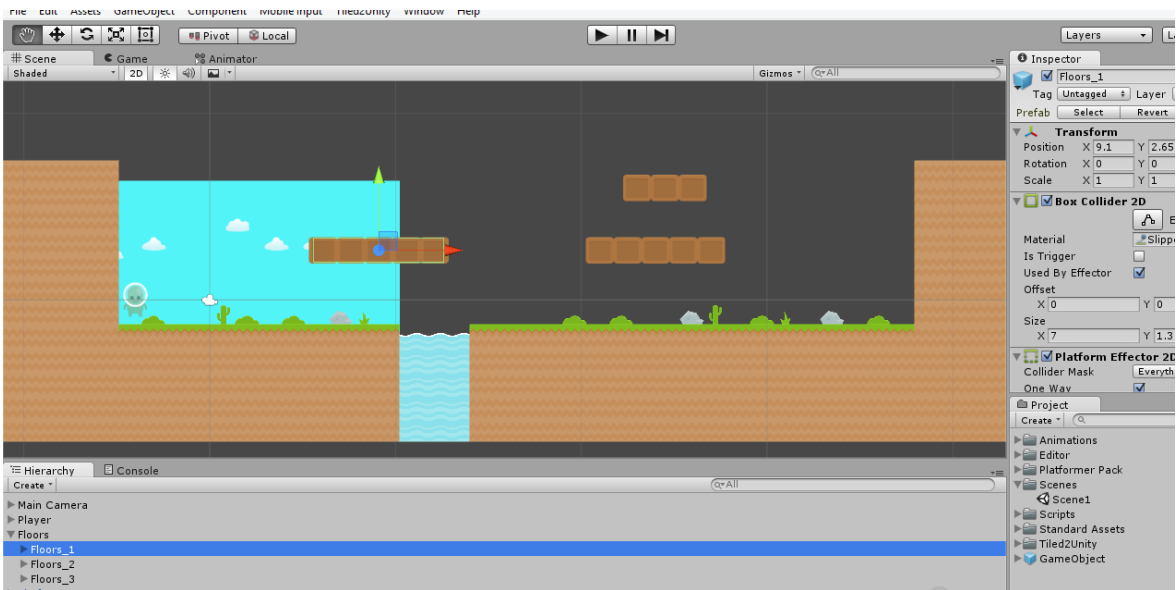
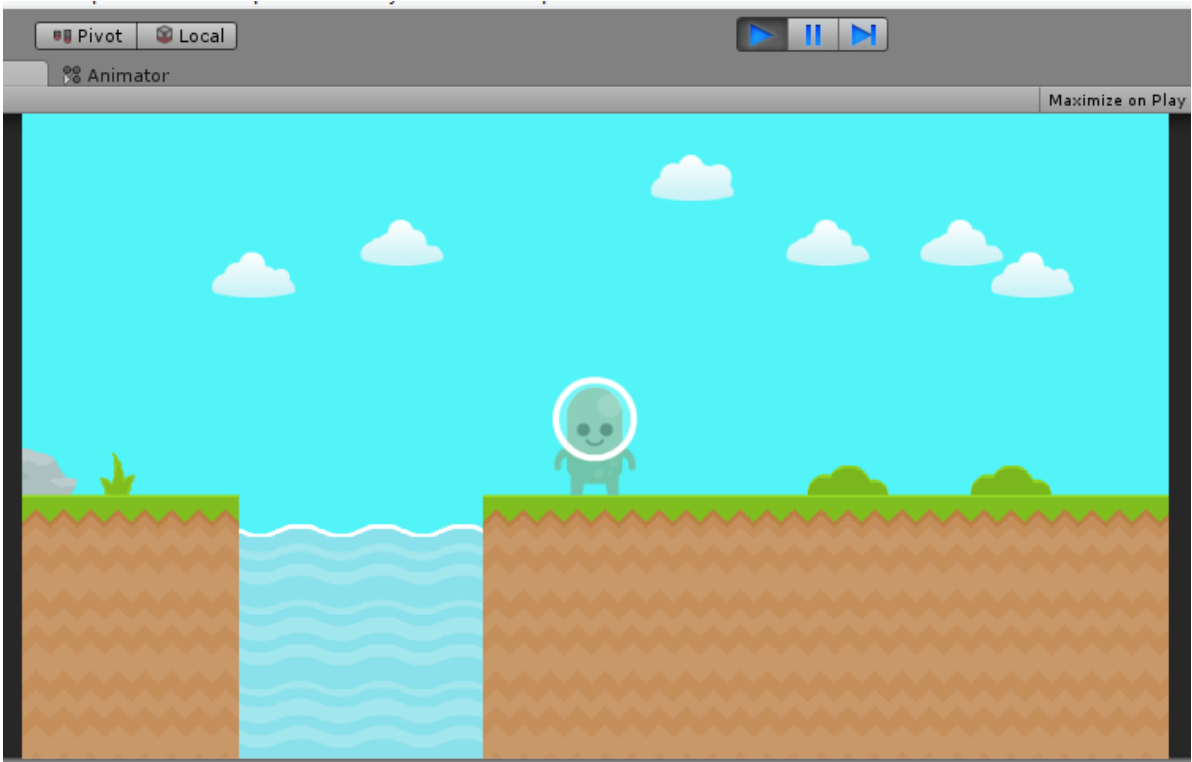


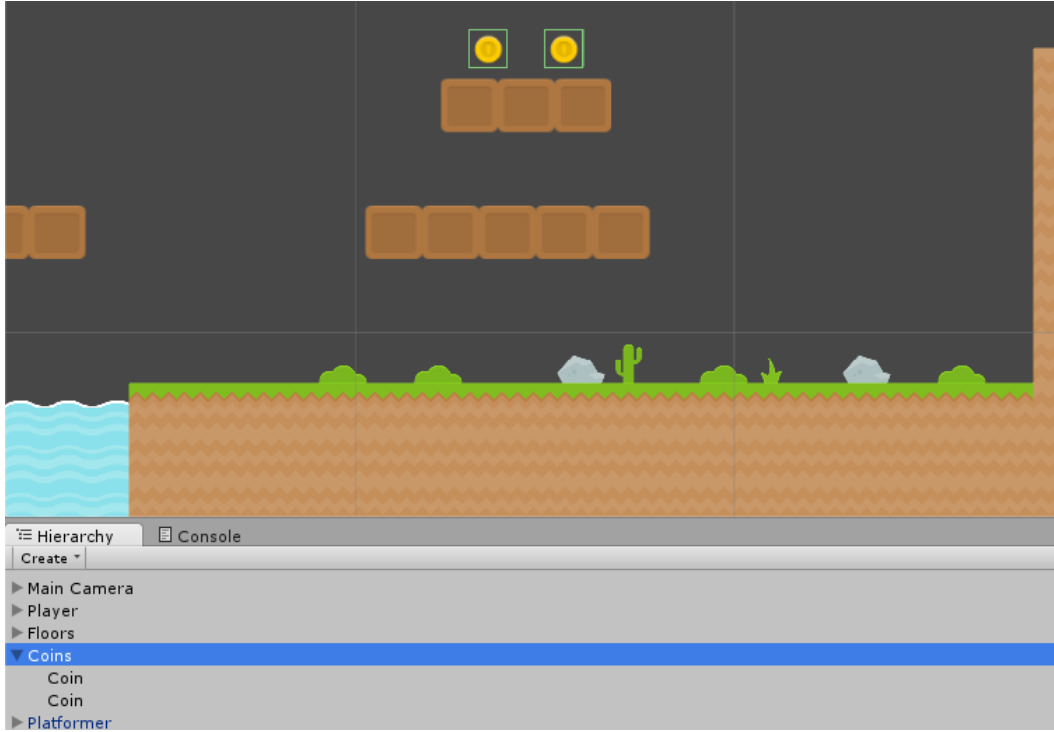


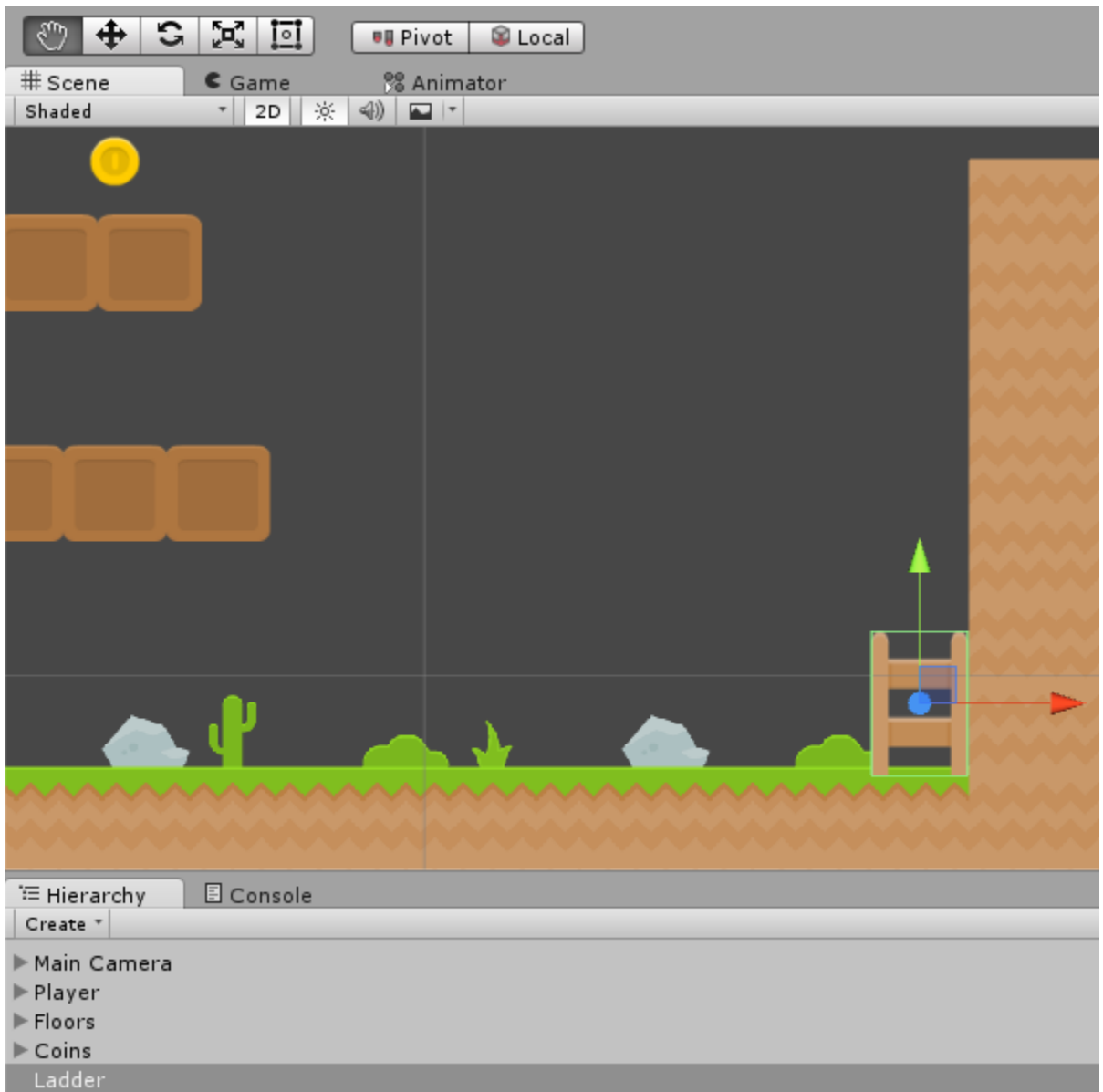




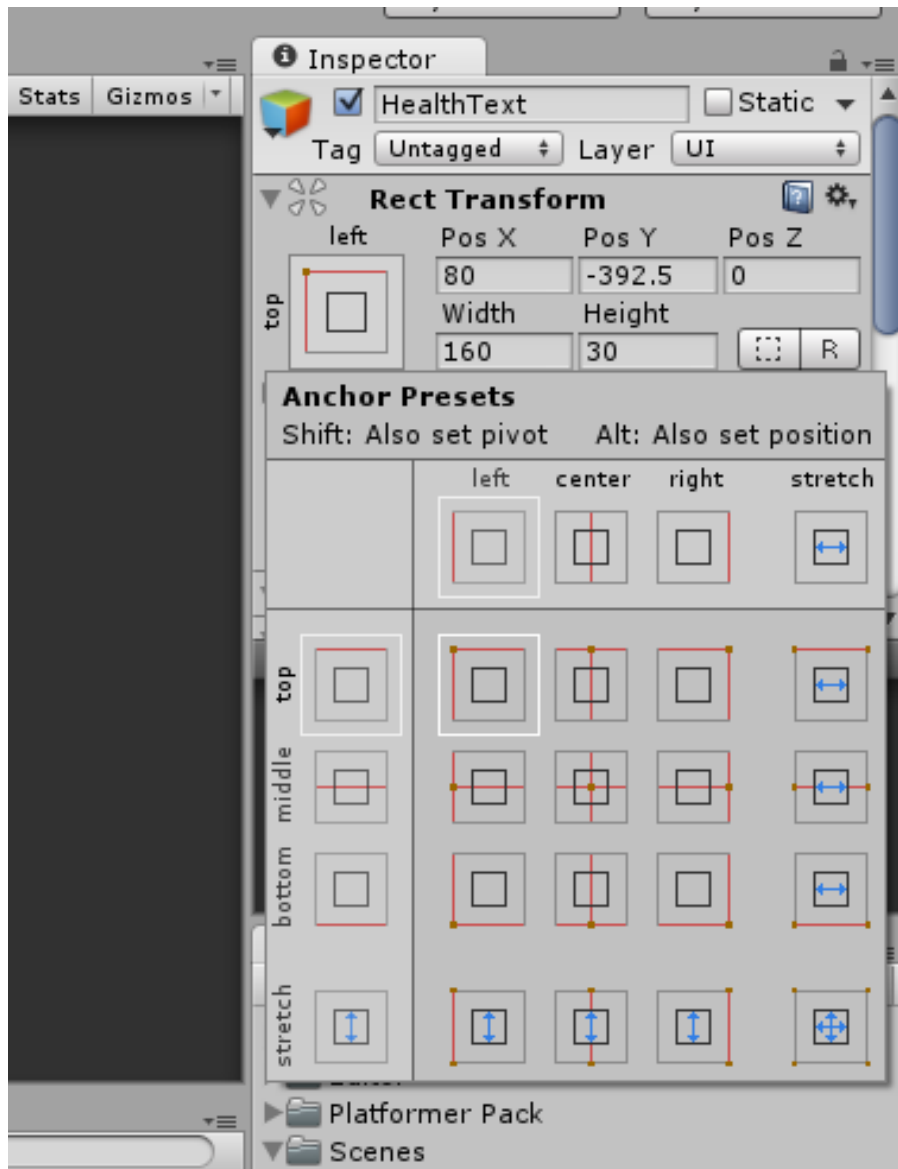


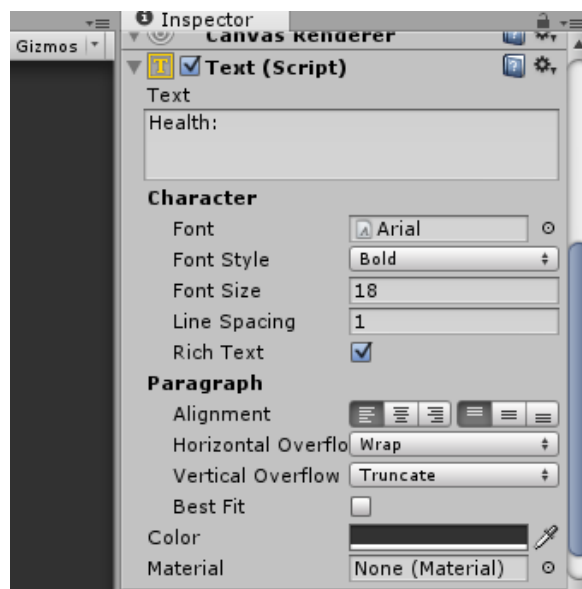
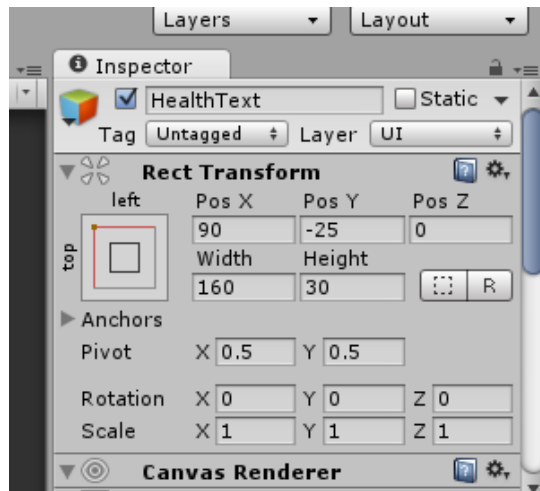


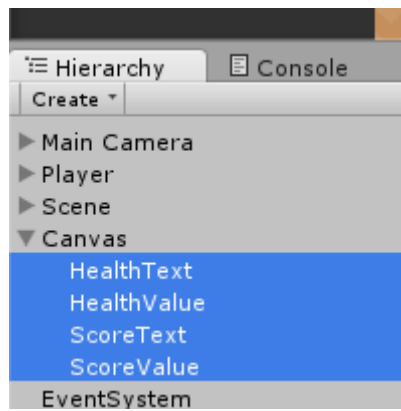
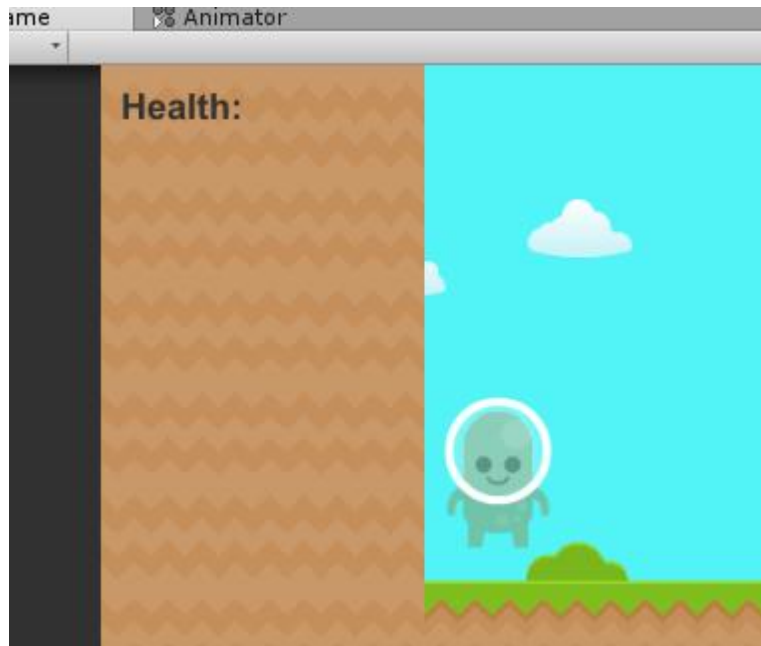


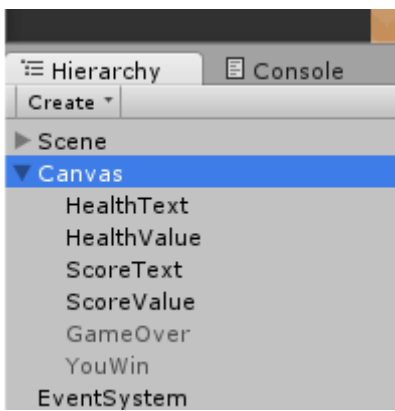


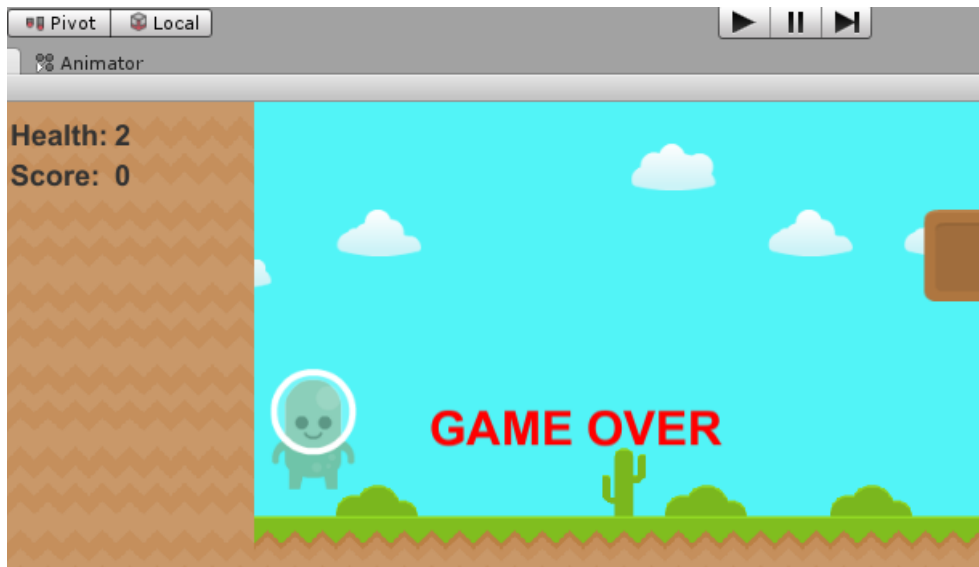


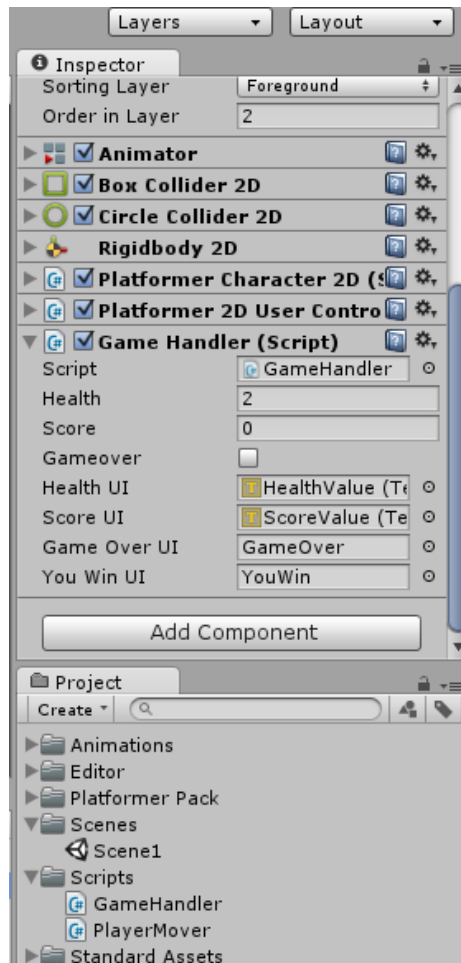












Inspector

Enemy1  Static

Tag Untagged Layer Default

**Transform**

Position X 0 Y 0 Z 0  
Rotation X 0 Y 0 Z 0  
Scale X -3 Y 3 Z 3

**Sprite Renderer**

Sprite snailWalk1  
Color  
Material Sprites-Default  
Sorting Layer Foreground  
Order in Layer 5

**Animator**

Controller TestEnemy4  
Avatar None (Avatar)  
Apply Root Motion  
Update Mode Normal  
Culling Mode Always Animate

Clip Count: 1  
Curves Pos: 0 Rot: 0 Scale: 0 Muscles: 0  
Generic: 0 PPtr: 1  
Curves Count: 1 Constant: 0 (0.0%)  
Dense: 0 (0.0%) Stream: 1 (100.0%)

**Box Collider 2D**

Material None (Physics Ma)  
Is Trigger

Inspector

Update Mode Normal  
Culling Mode Always Animate

Clip Count: 1  
Curves Pos: 0 Rot: 0 Scale: 0 Muscles: 0  
Generic: 0 PPtr: 1  
Curves Count: 1 Constant: 0 (0.0%)  
Dense: 0 (0.0%) Stream: 1 (100.0%)

**Box Collider 2D**

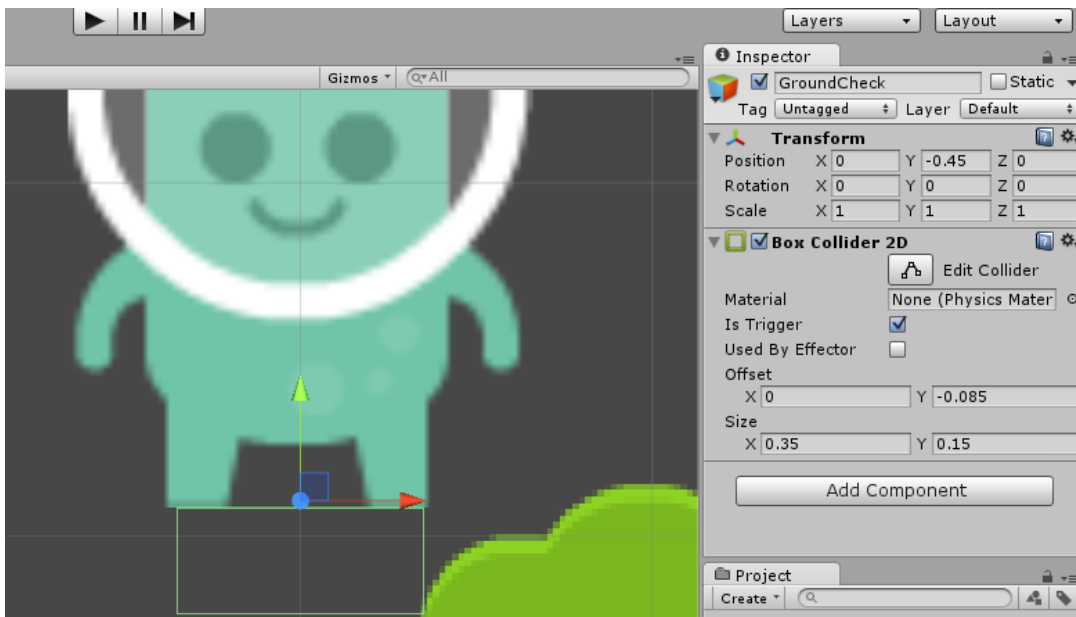
Edit Collider

Material None (Physics Ma)  
Is Trigger  
Used By Effector  
Offset X 0 Y 0  
Size X 0.54 Y 0.31

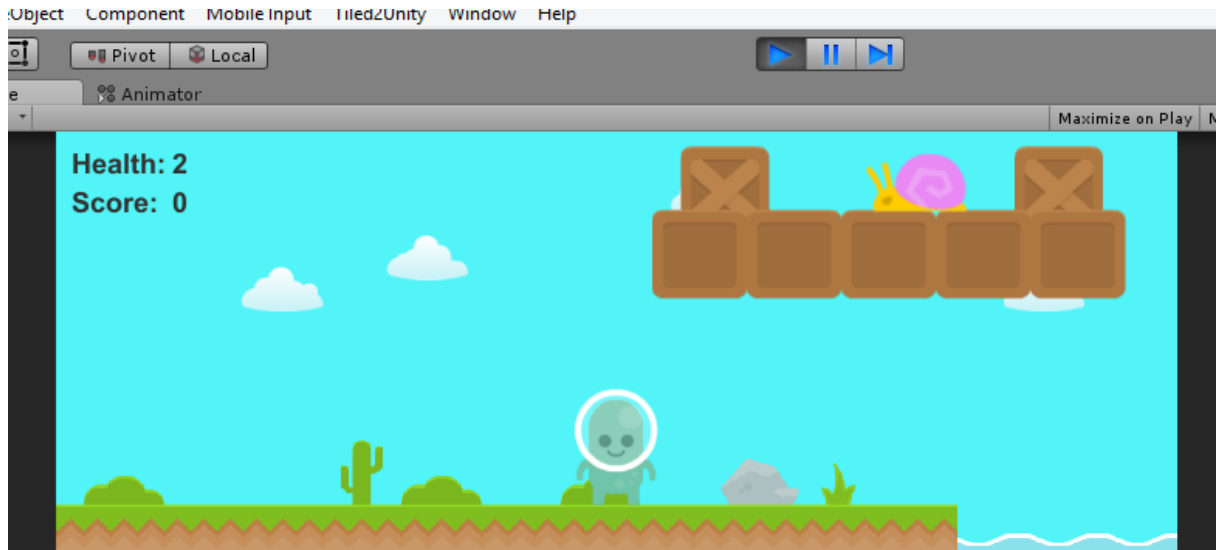
**Rigidbody 2D**

Mass 1  
Linear Drag 0  
Angular Drag 0.05  
Gravity Scale 1  
Fixed Angle  
Is Kinematic  
Interpolate None  
Sleeping Mode Start Awake  
Collision Detection Discrete

Add Component



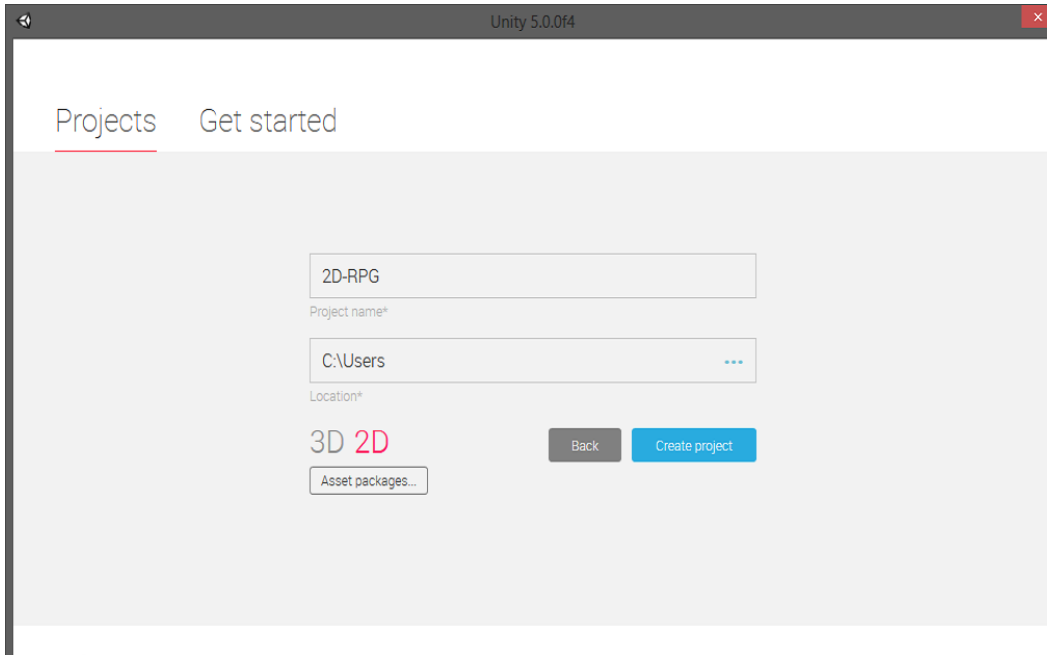


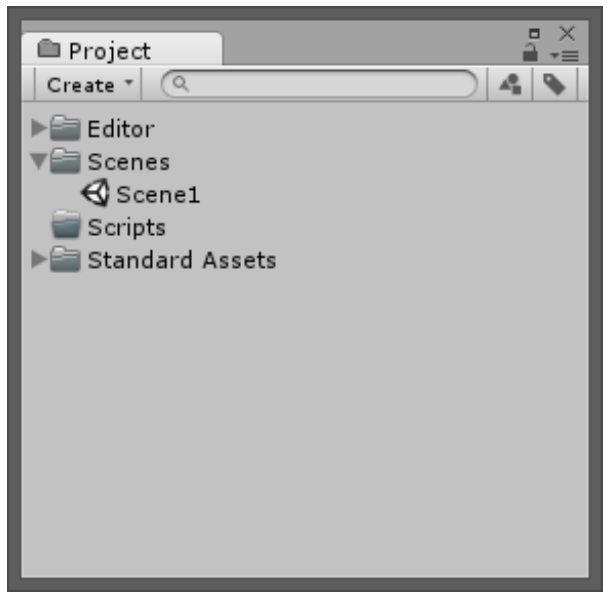
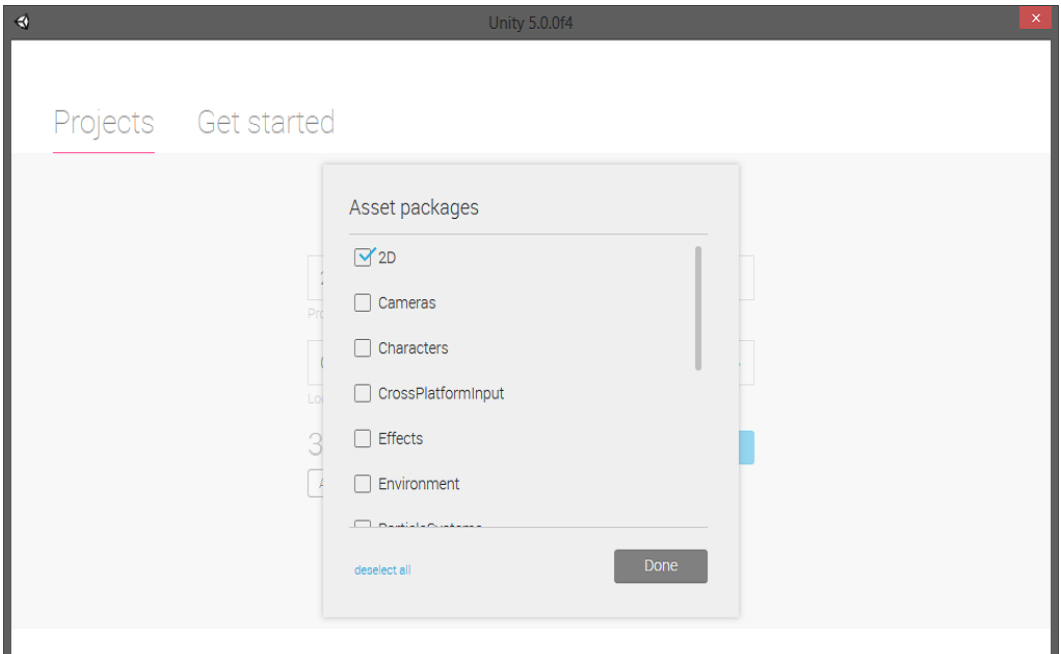


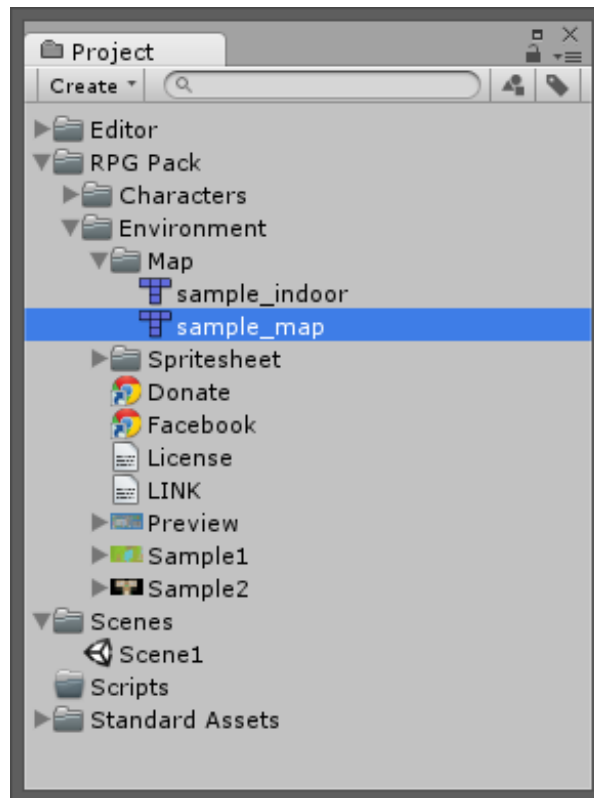


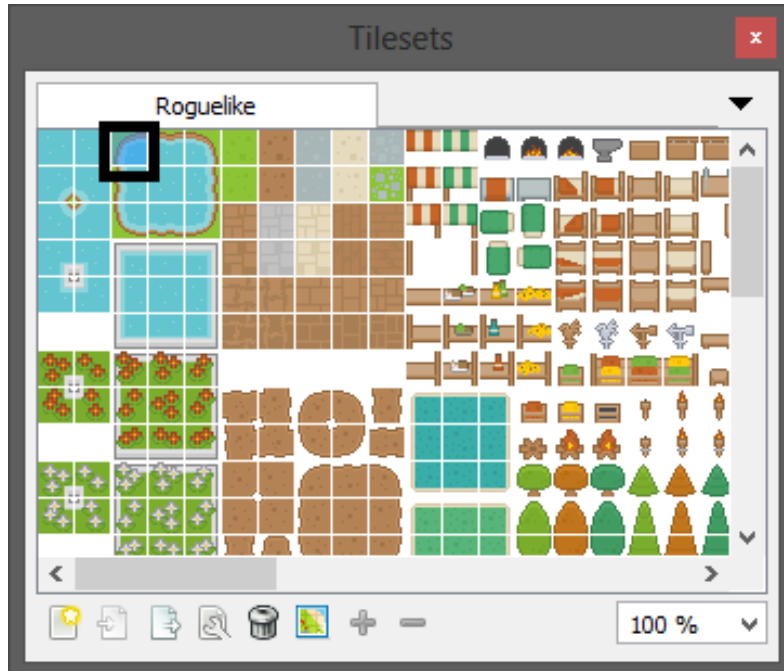
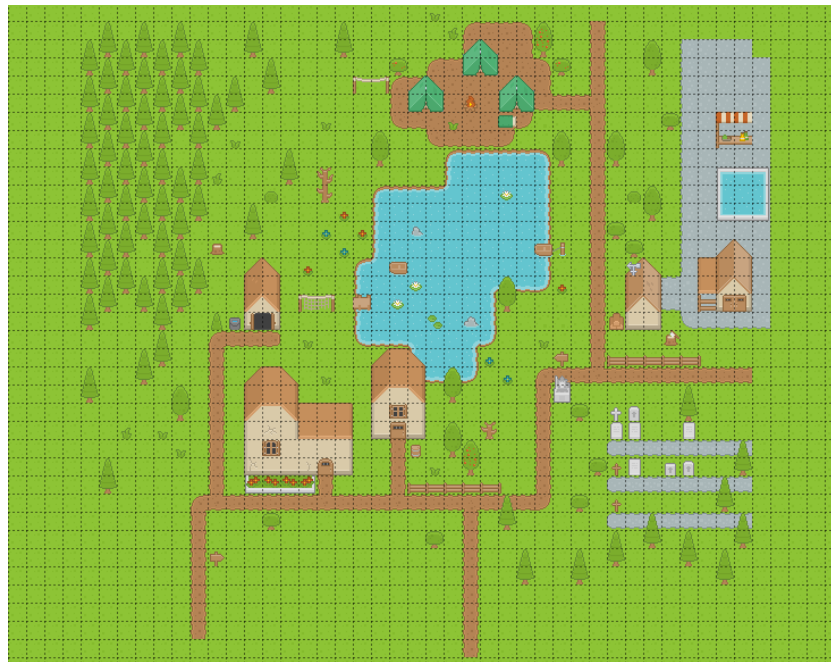


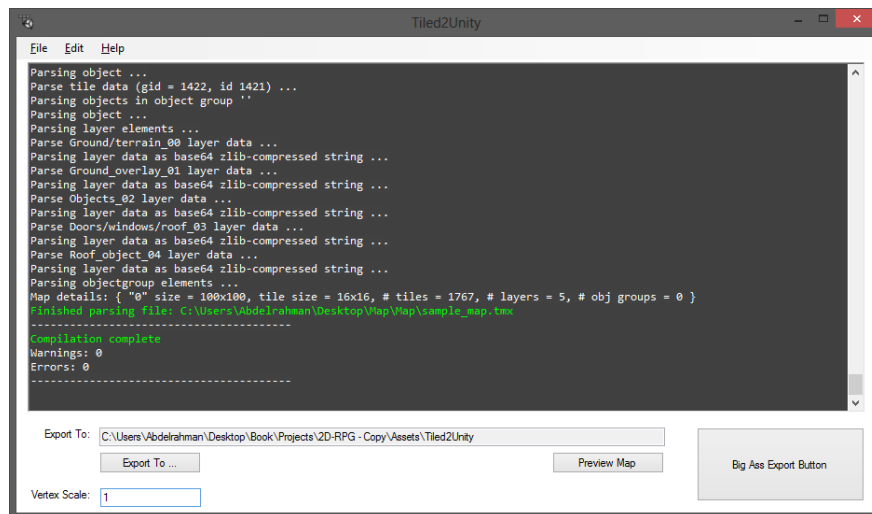
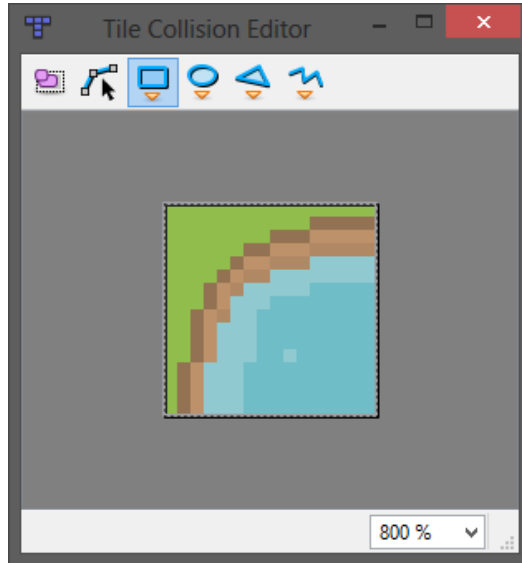
## Chapter 5: Creating Our Own RPG



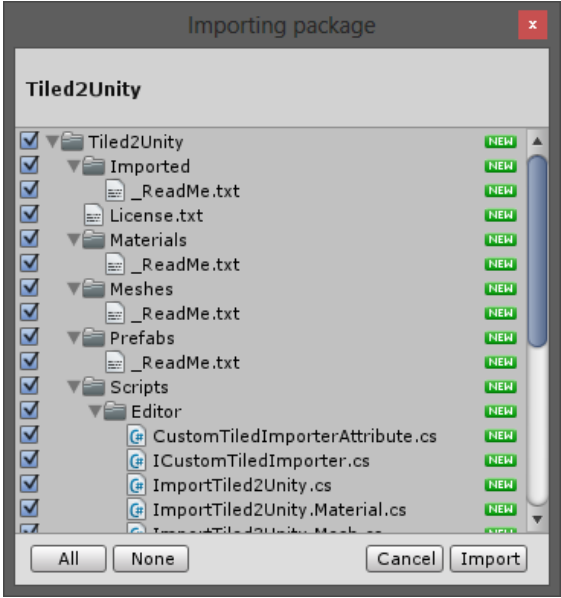












**Inspector**

Map  Static

Tag: Untagged Layer: Default

Prefab: Select Revert Apply

**Transform**

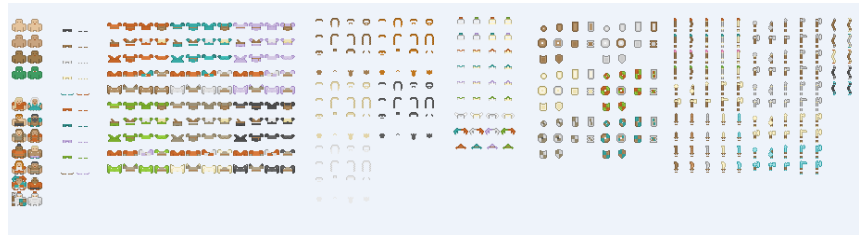
Position	X	-18.5	Y	25	Z	0
Rotation	X	0	Y	0	Z	0
Scale	X	2	Y	2	Z	1

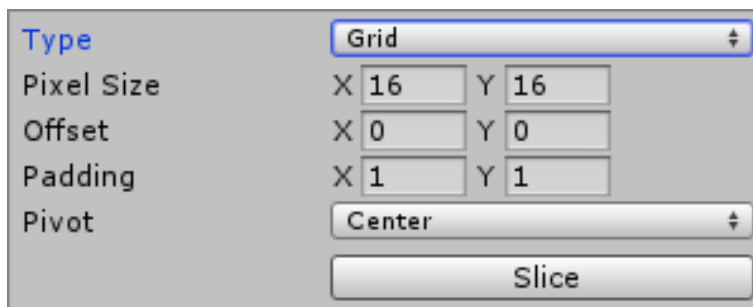
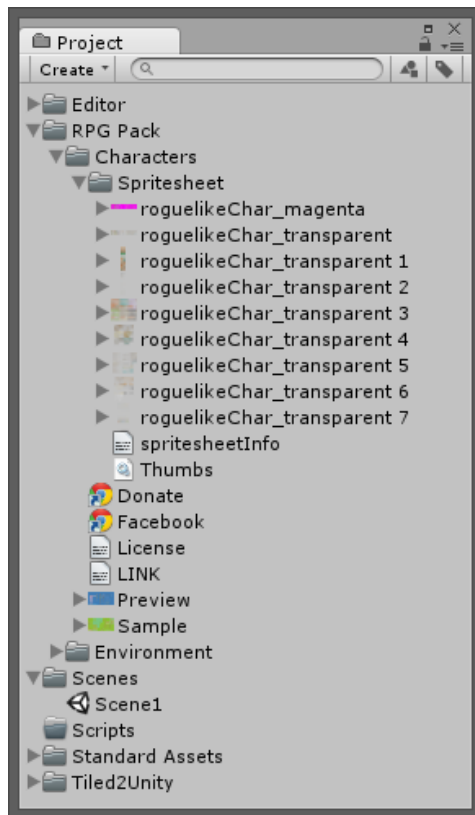
**Tiled Map (Script)**

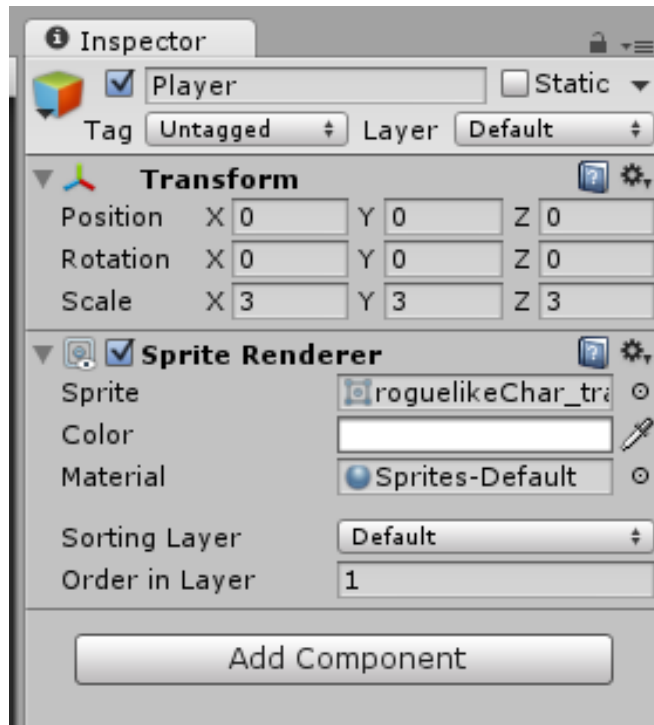
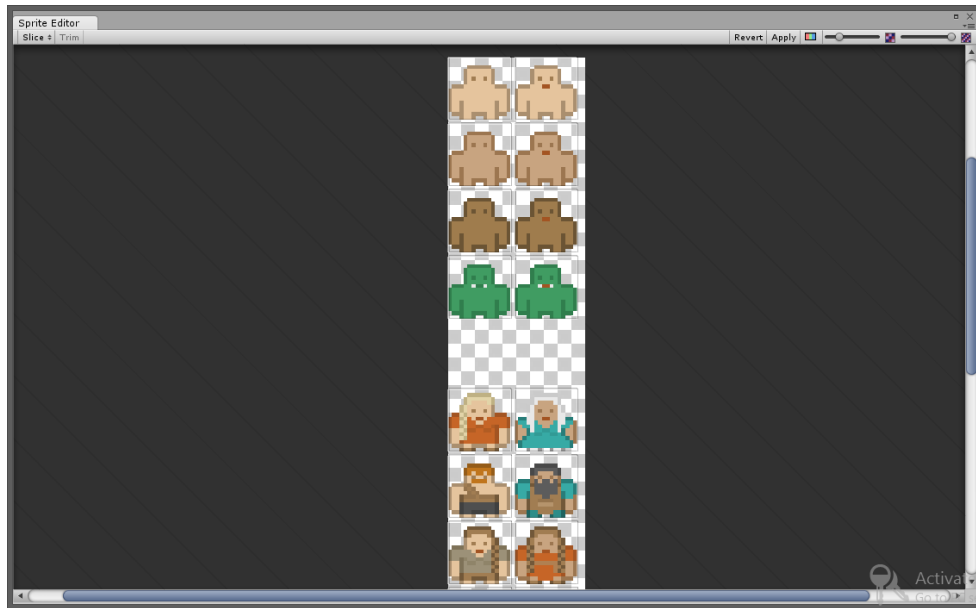
Script: TiledMap

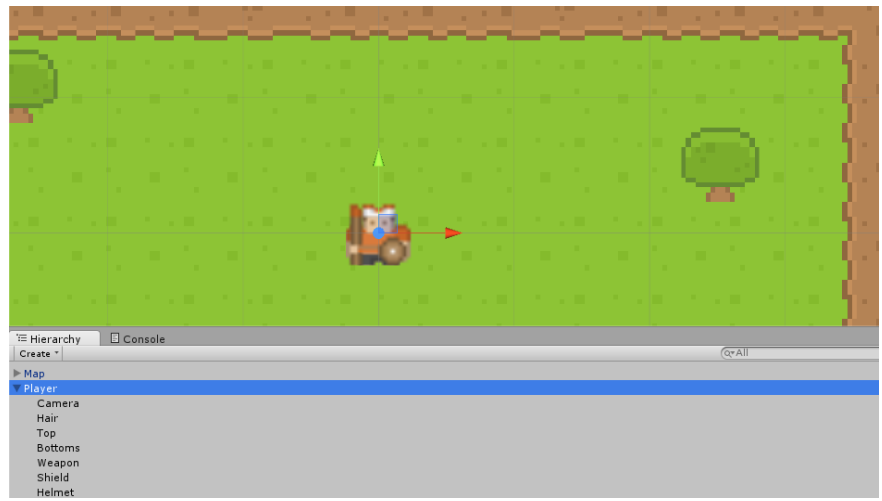
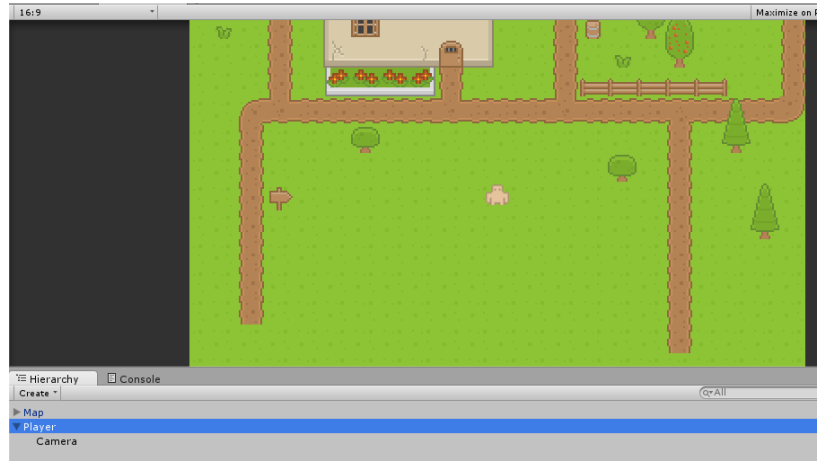
Num Tiles Wide	100
Num Tiles High	100
Tile Width	16
Tile Height	16
Export Scale	0.018
Map Width In Pixels	1600
Map Height In Pixels	1600

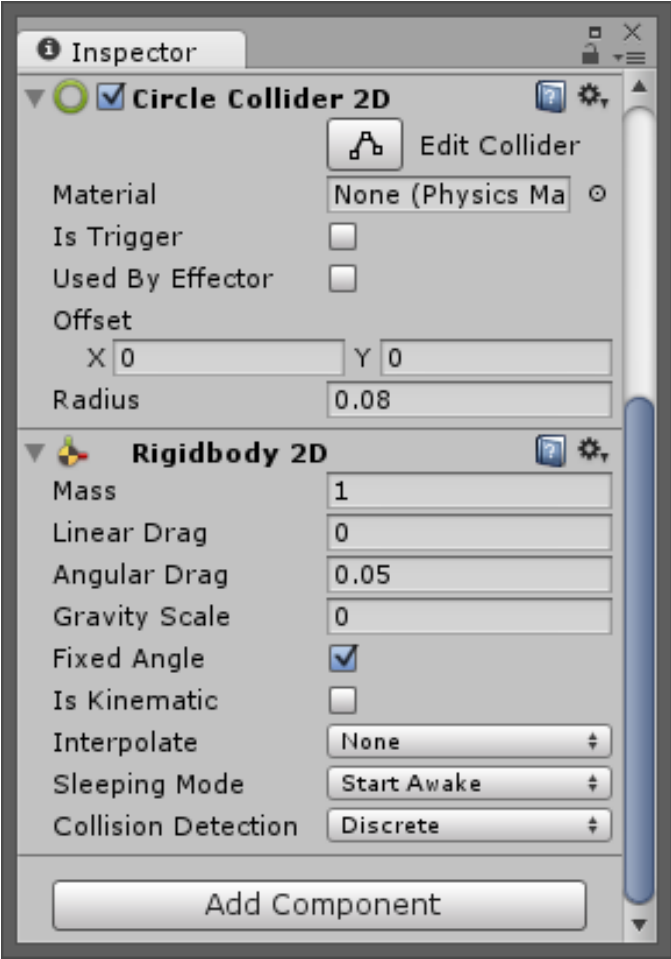
Add Component

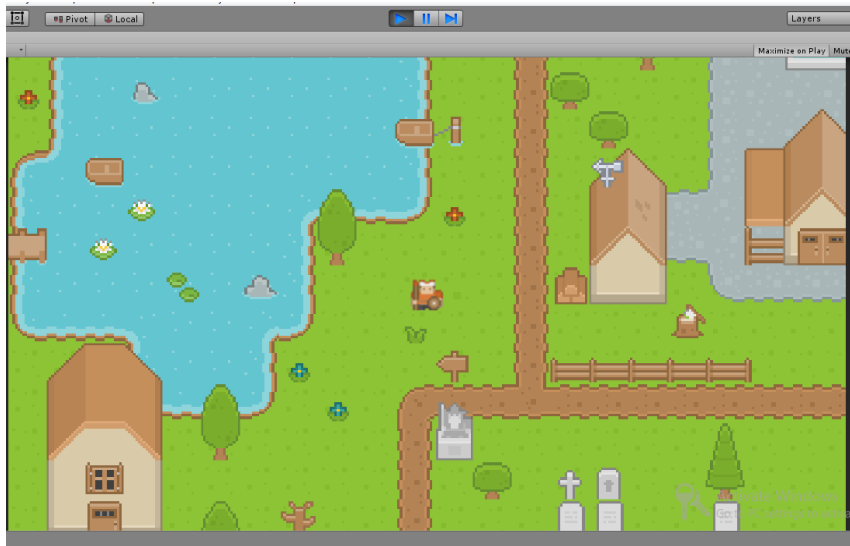
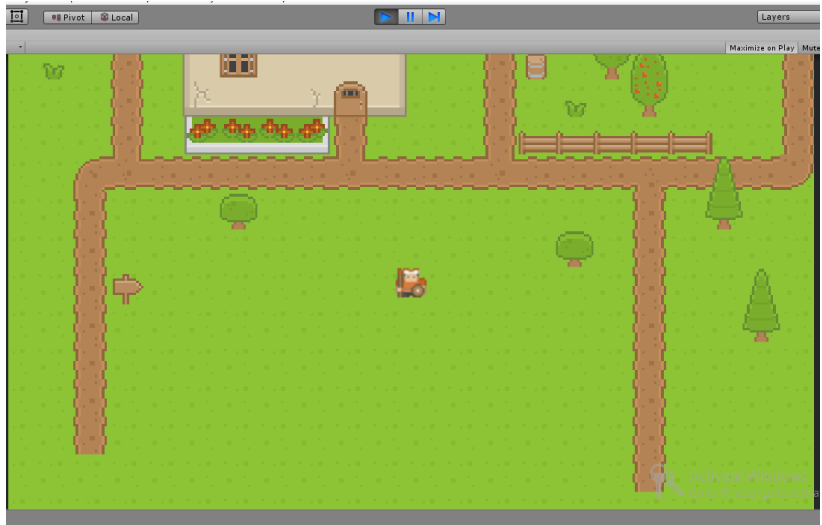




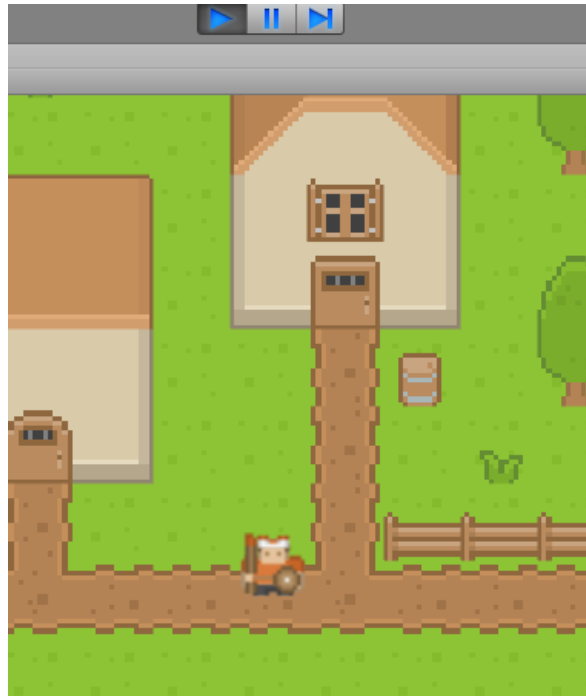
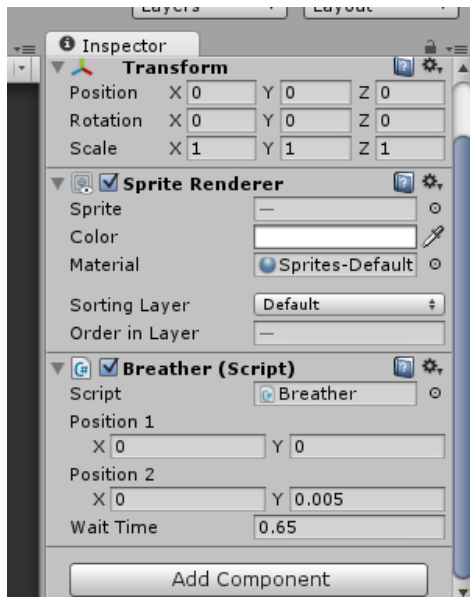






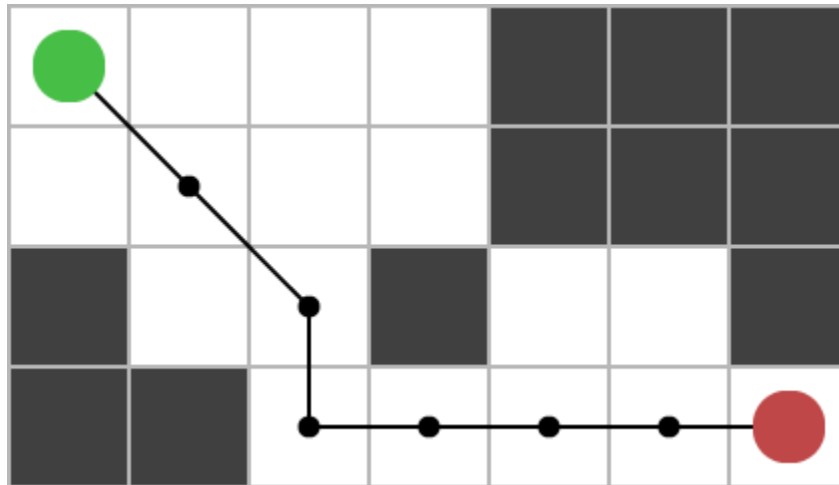








## Chapter 6: AI and Pathfinding



arongranberg.com/astar/download

The A\* Pathfinding Project is compatible with Unity 5!

### Free Version

Free version of the project. Slightly more limited than the pro version, but still very powerful. Go ahead and try it out!  
Includes several example scenes showing how to use the system.

Download (version: 3.7.4, last updated: 13 Sep 2015 (last month))

### Beta Version (Free)

Lots of cool new features and fixes in this version, check out the [changelog](#)

Download (version: 3.7.1, downloads: 3148, last updated: 01 Aug 2015)

### Pro Version

Pro version with more features, automatic navmesh calculation, and more.  
[free vs pro comparison page](#)

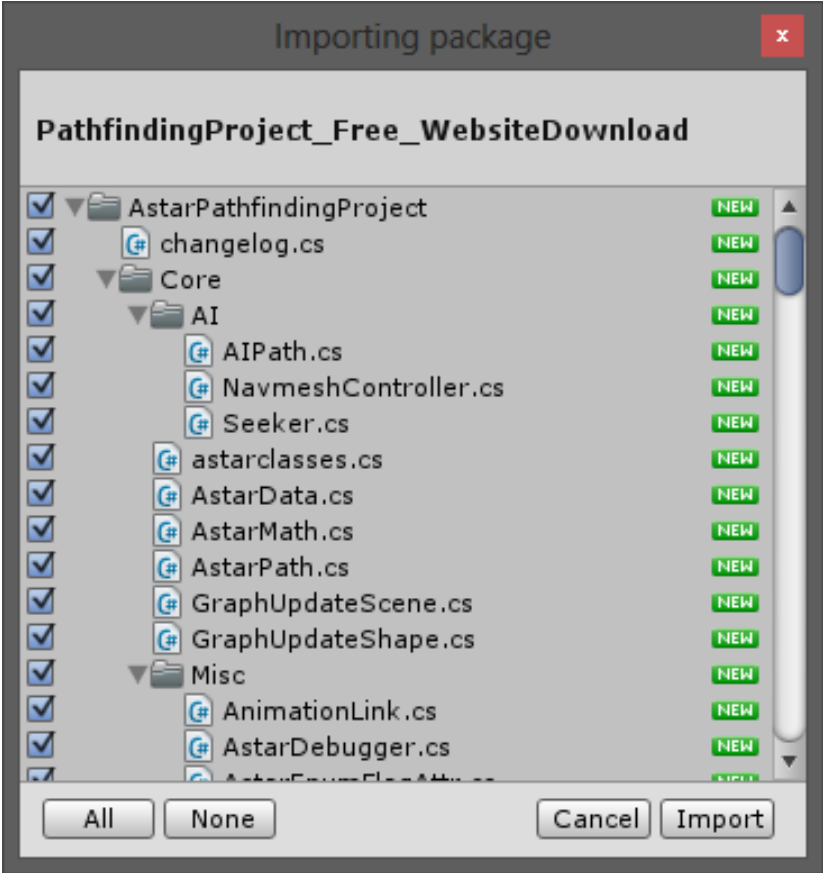
Requires Pro (version: 3.7.4)

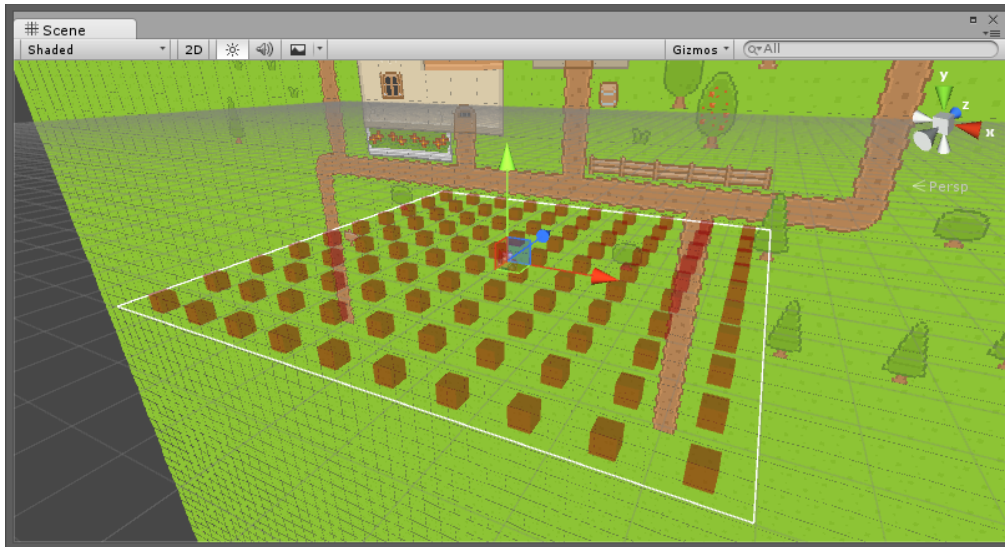
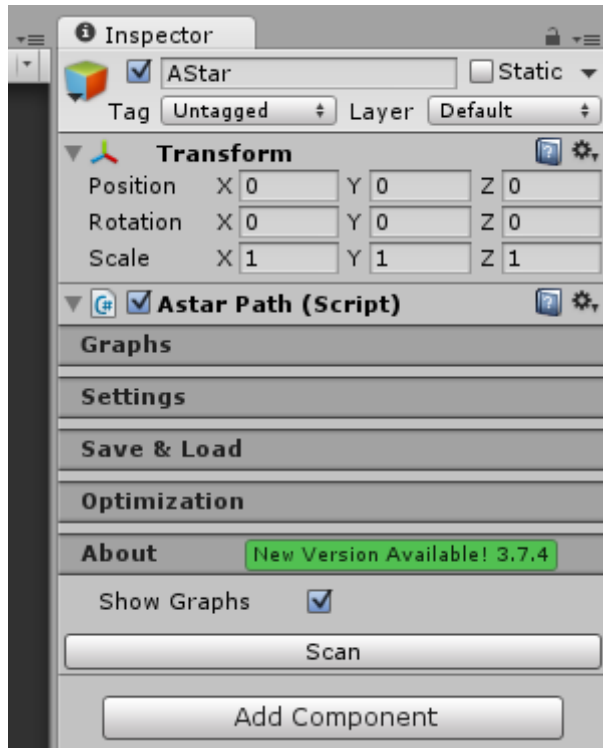
### Beta Version (Free)

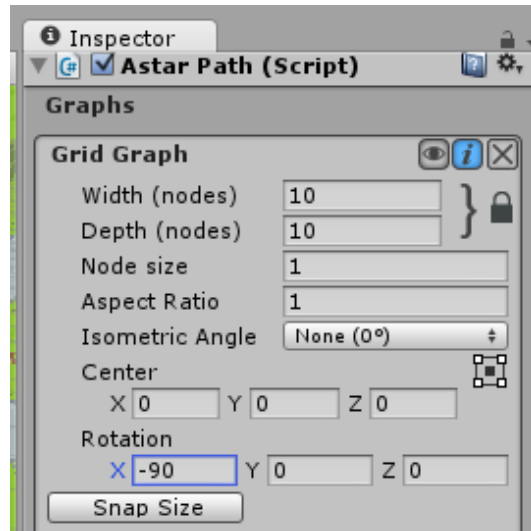
Lots of cool new features and fixes in this version, check out the [changelog](#)

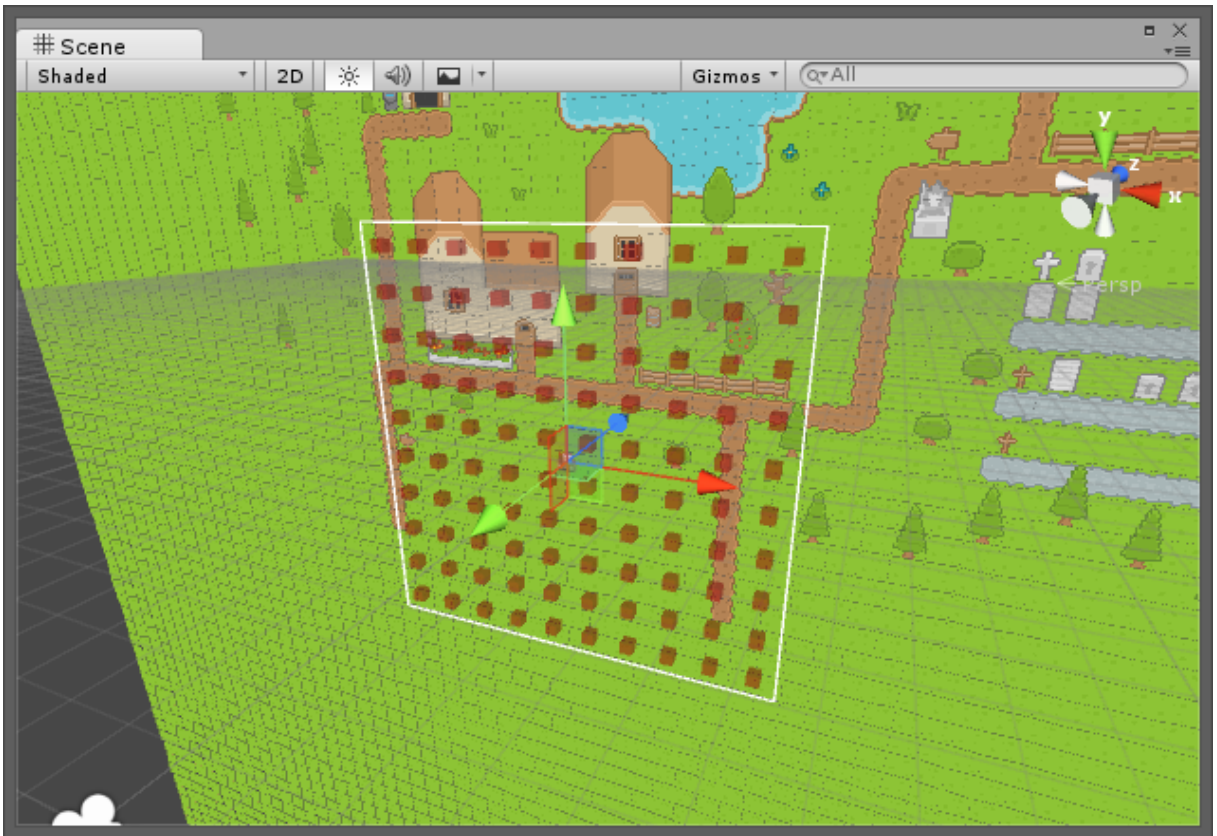
Requires Pro (version: 3.7.1)

The A\* Pathfinding Project works with Unity 4.6 and up. If you need an older version of the project that is compatible with Unity 4.5, please use the [Unity 4.5 version](#).









**Inspector**  
Grid Graph

**Grid Graph**

Width (nodes) 10 }  
Depth (nodes) 10 }  
Node size 1  
Aspect Ratio 1  
Isometric Angle None (0°)  
Center X 0 Y 0 Z 0  
Rotation X 270 Y 0 Z 0  
Snap Size

Connections Eight  
Cut Corners   
Max Climb 0.4  
Climb Axis Y

Max Slope 90  
Erosion iterations 0

Use 2D Physics

**Collision testing**

Collider type Capsule  
Diameter 1  
Height/Length 2  
Offset 0  
Mask Nothing

**Height testing**

Ray length 100  
Mask Everything  
Thick Raycast   
Unwalkable when



Inspector

**Astar Path (Script)**

**Graphs**

**Grid Graph**

Width (nodes) 65

Depth (nodes) 65

Node size 1

Aspect Ratio 1

Isometric Angle None (0°)

Center

X 10 Y -5 Z 0

Rotation

X 270 Y 0 Z 0

Snap Size

Connections Eight

Cut Corners

Max Climb 0

Climb Axis Z

Erosion iterations 0

Use 2D Physics

**Collision testing**

Collider type Ray

Diameter 1

Height/Length 2

Offset 0

Mask Everything

**Height testing**

Ray length 100

Mask Everything

Thick Raycast

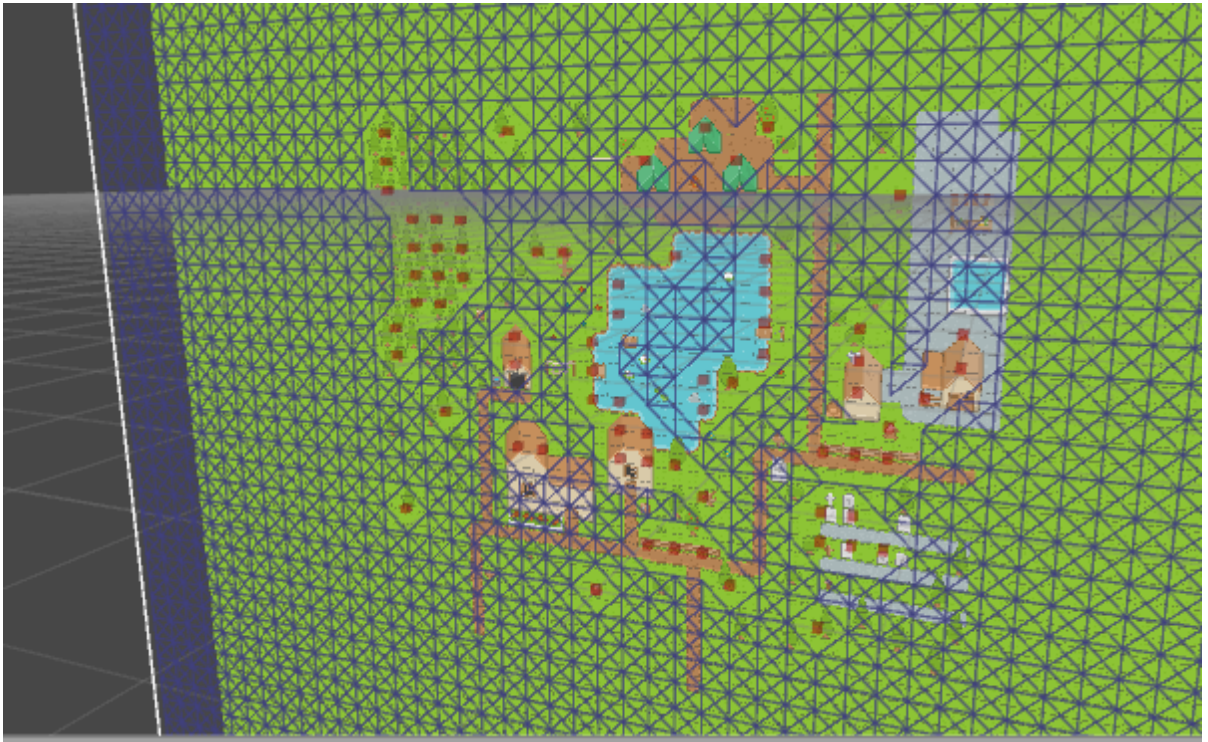
Unwalkable when

**Advanced**

► Penalty Modifications

Initial Penalty 0

**Add New Graph**





Inspector

Soldier  Static

Tag Untagged Layer Default

**Transform**

Position X -0.4 Y 2.25 Z 0

Rotation X 0 Y 0 Z 0

Scale X 3 Y 3 Z 3

**Sprite Renderer**

Sprite roguelikeChar\_

Color

Material Sprites-Default

Sorting Layer Default

Order in Layer 10

**Circle Collider 2D**

Material None (Physics Ma)

Is Trigger

Used By Effector

Offset X 0 Y 0

Radius 0.08

**Rigidbody 2D**

Mass 1

Linear Drag 0

Angular Drag 0.05

Gravity Scale 0

Fixed Angle

Is Kinematic

Interpolate None

Sleeping Mode Start Awake

Collision Detection Discrete



**Seeker (Script)**

Script: Seeker

Draw Gizmos:

Detailed Gizmos:

Start End Modifier

Traversable Tags Compatibility

Valid Tags: Everything

Tag Penalties

Modifiers Priorities

---

**Enemy AI (Script)**

Script: EnemyAI

Target: Player (Transfo)

Speed: 85

Update Rate: 2

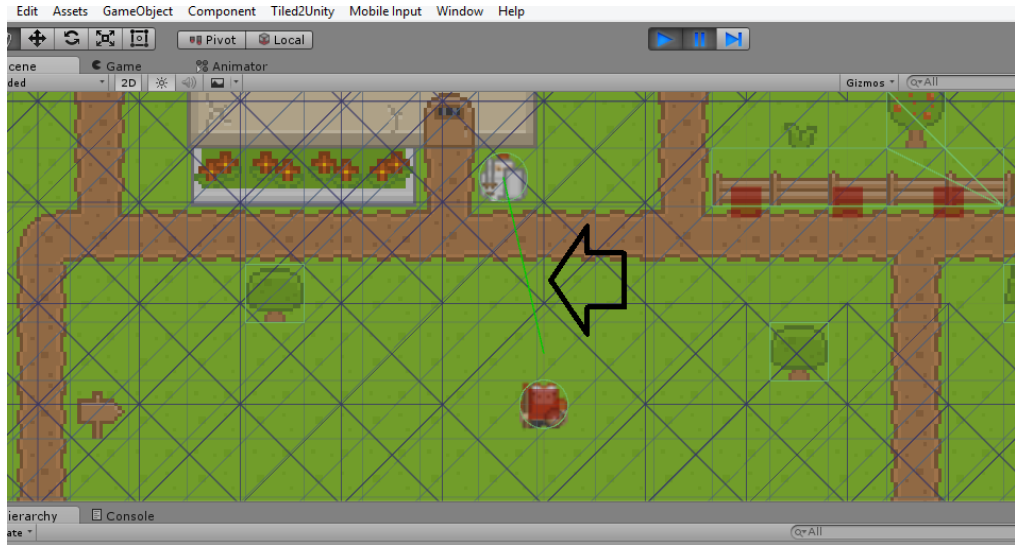
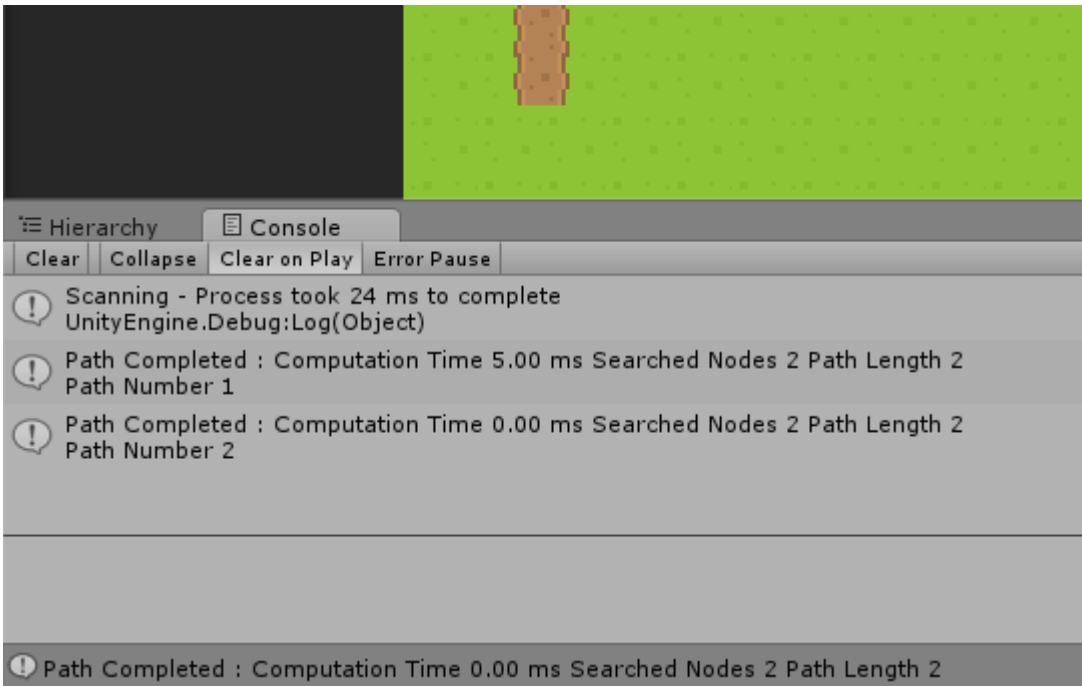
Next Waypoint: 0.3

End Distance: 0.8

Path Ended:

Add Component



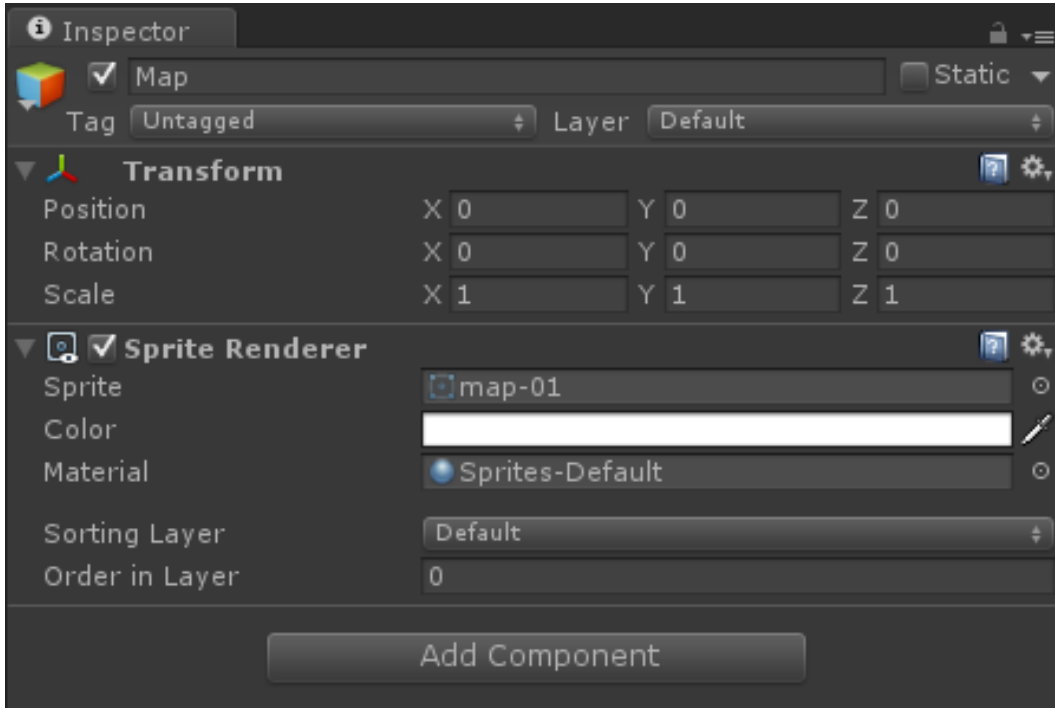


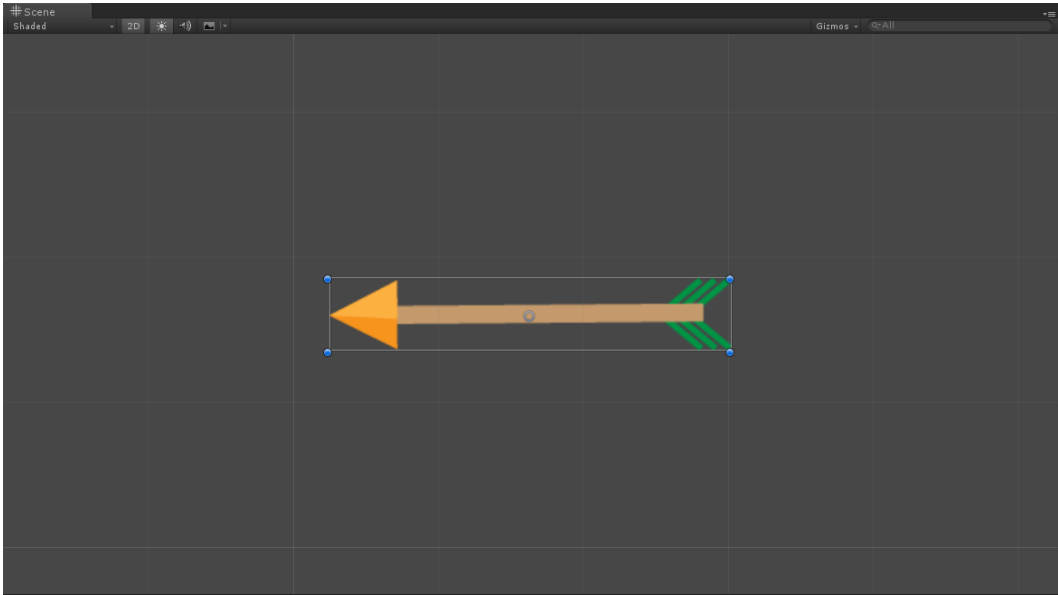
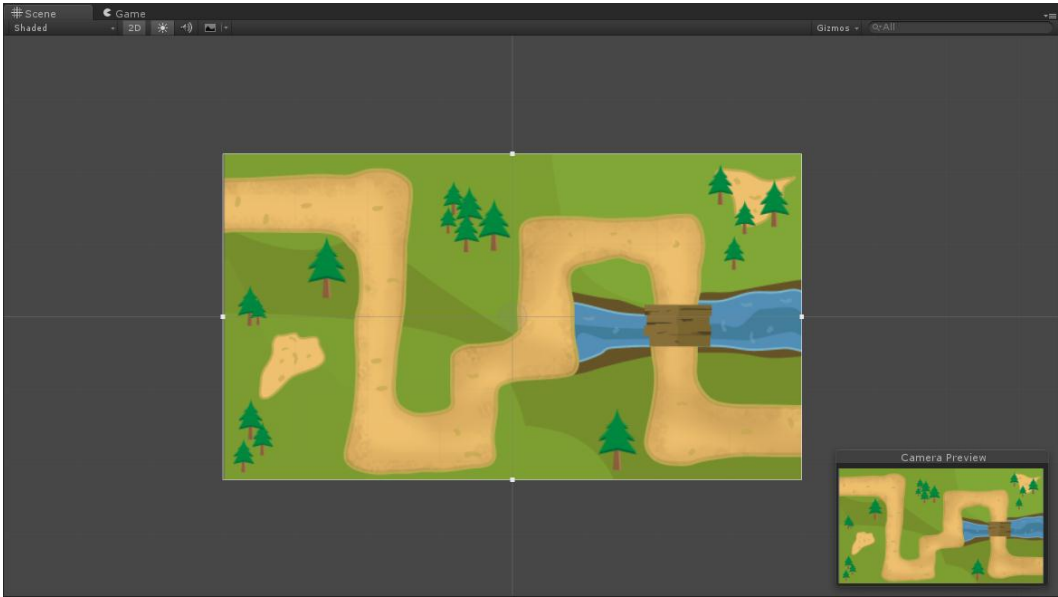


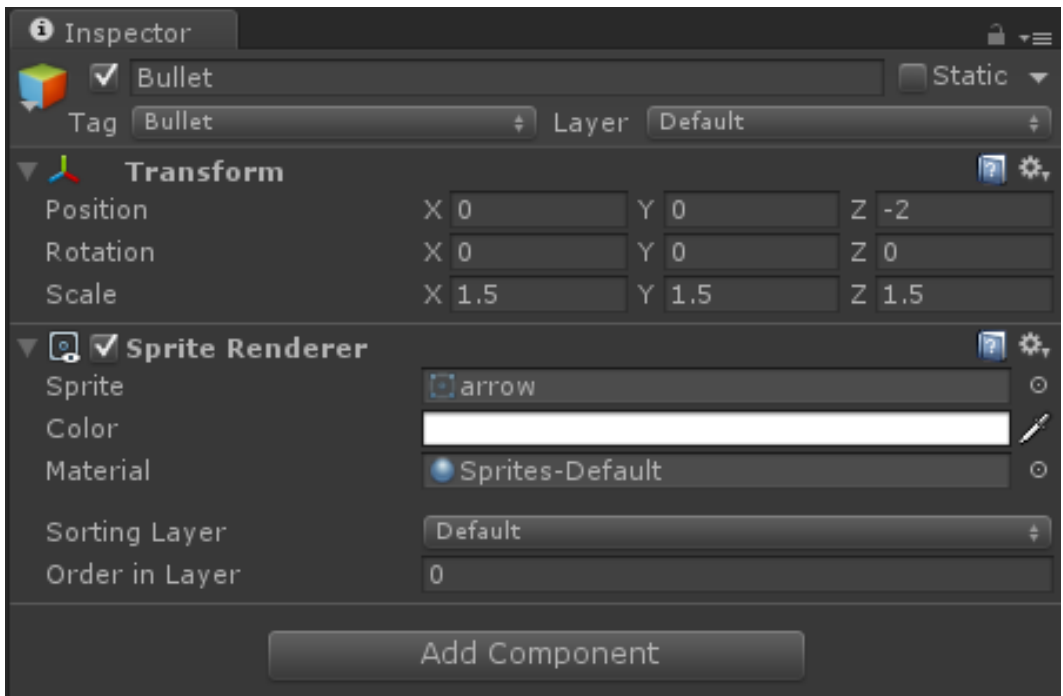
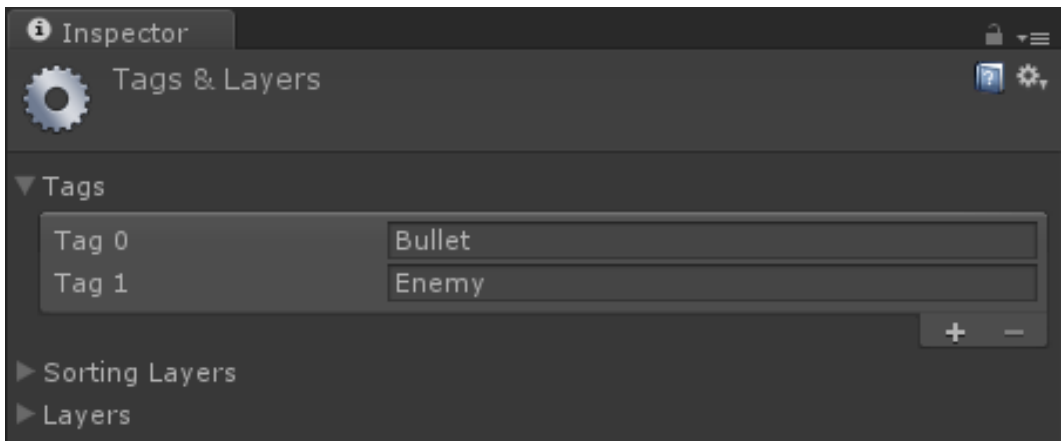
## **Chapter 7: Tower Defense Basics**

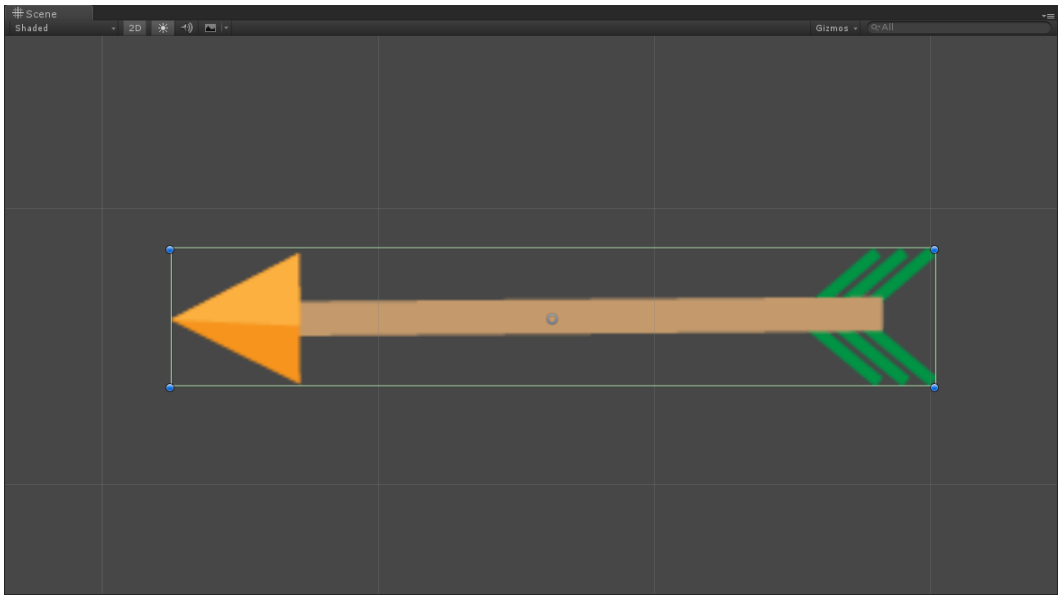












**Box Collider 2D** ? ⚙

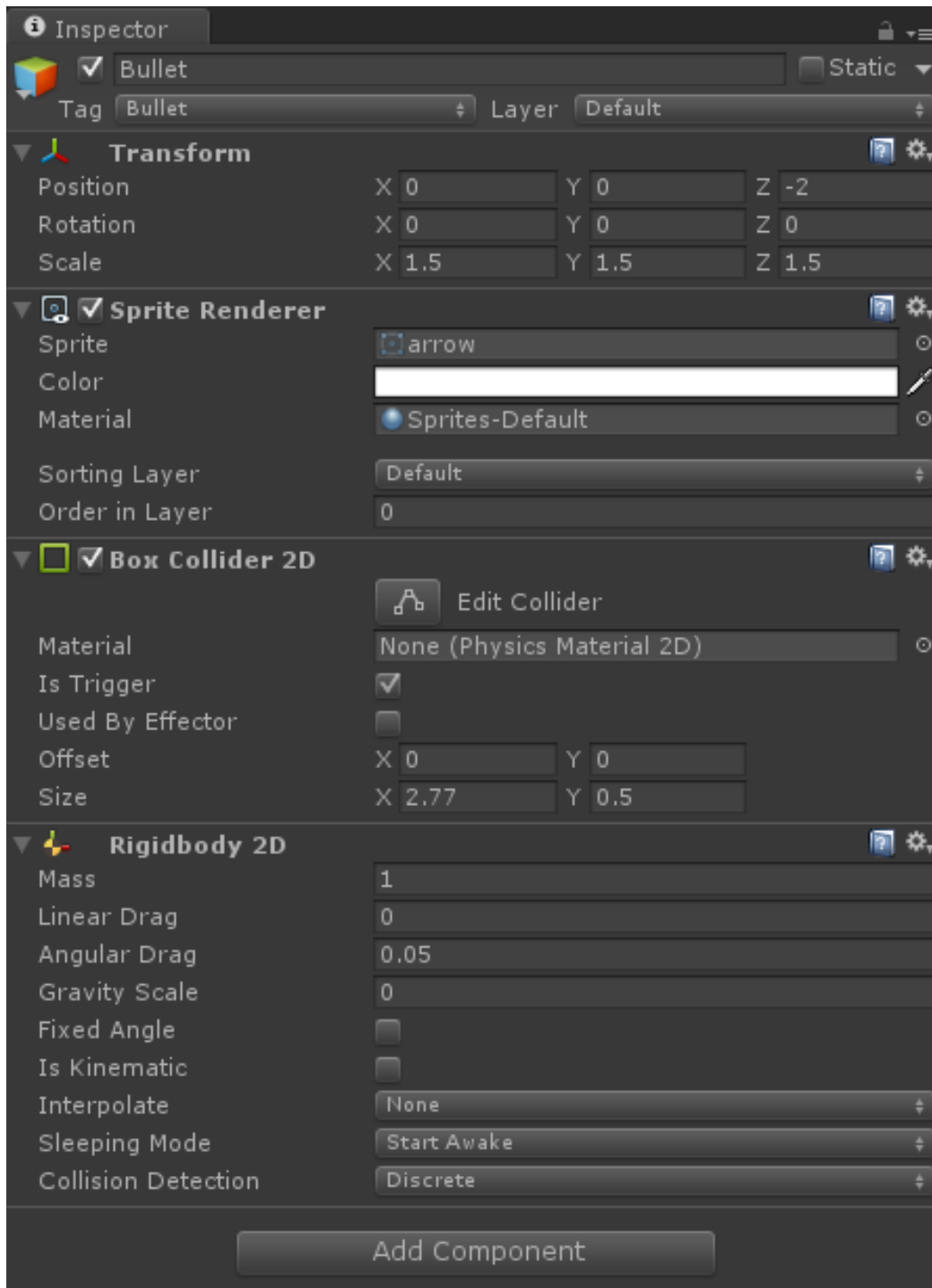
Material:

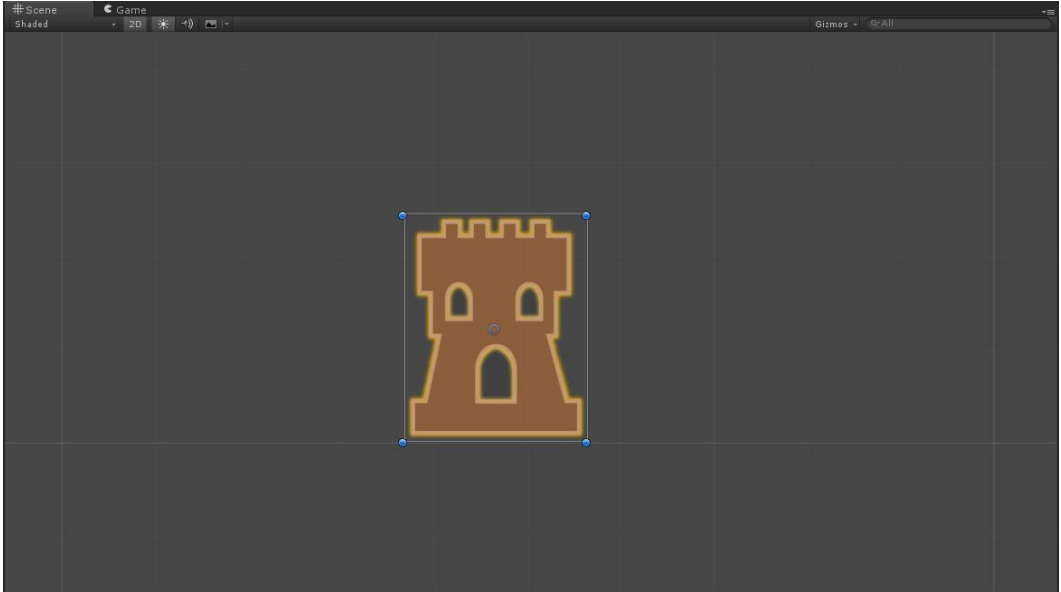
Is Trigger:

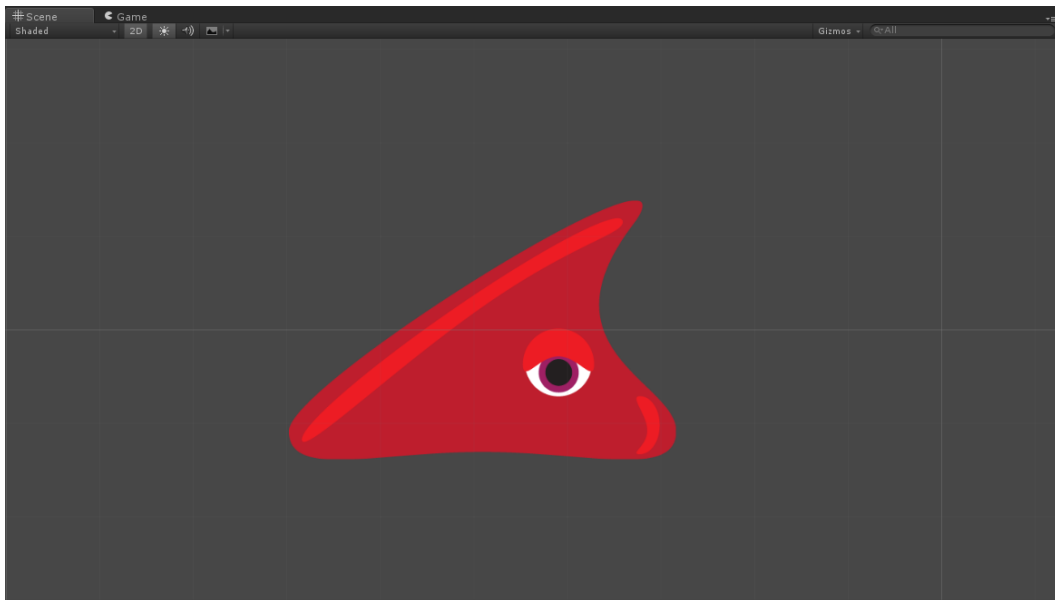
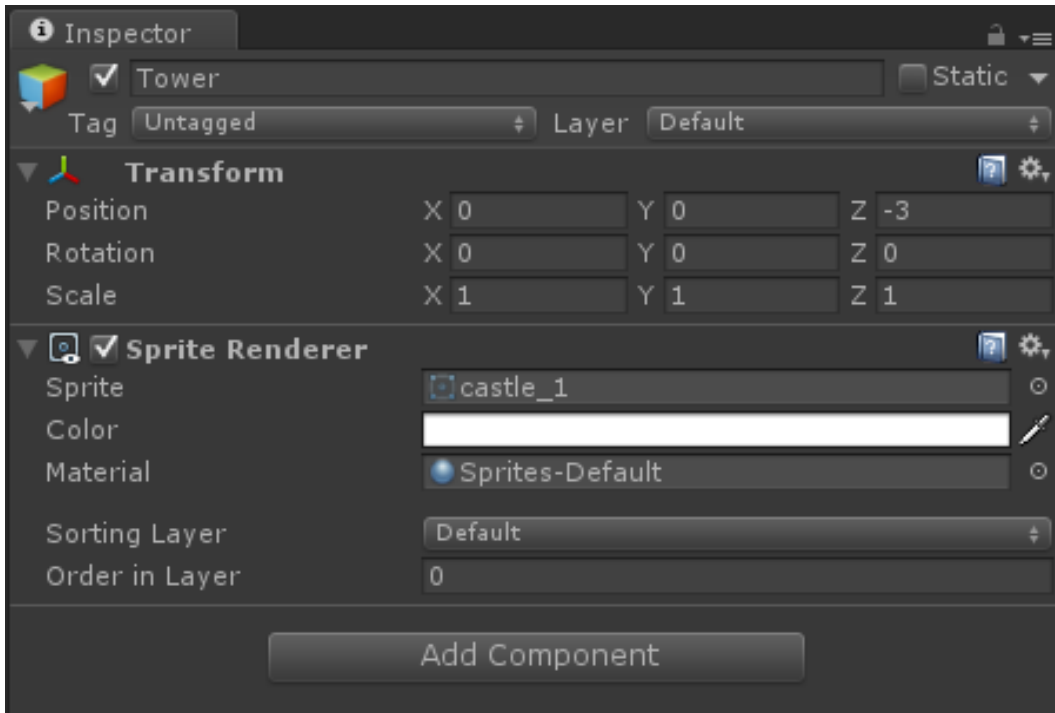
Used By Effector:

Offset: X  Y

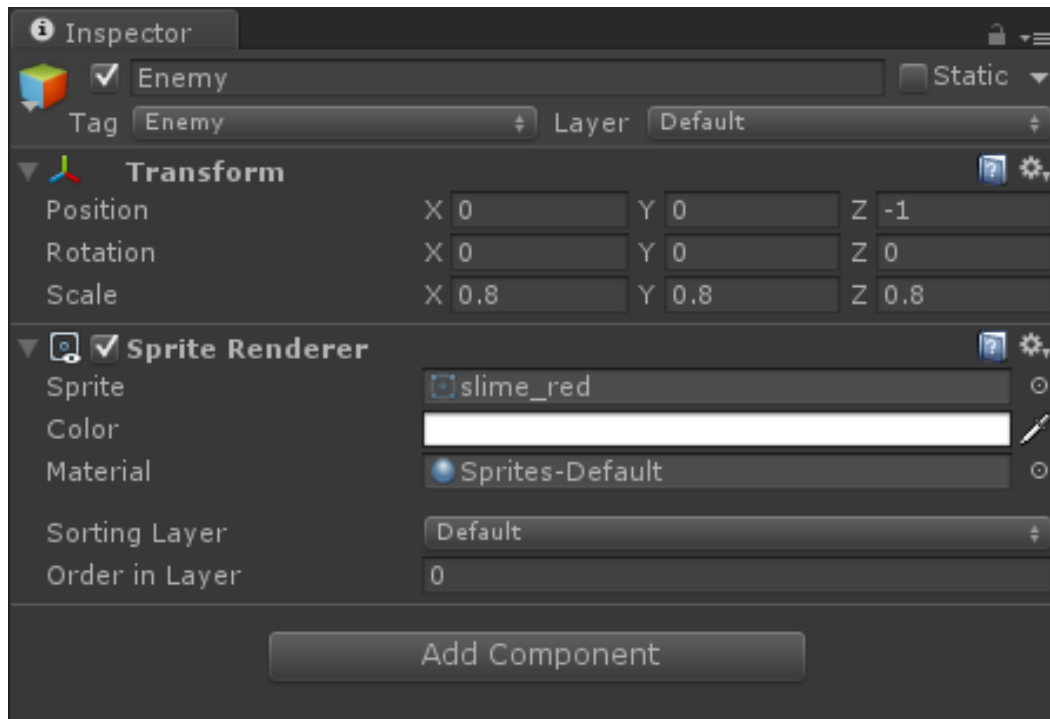
Size: X  Y

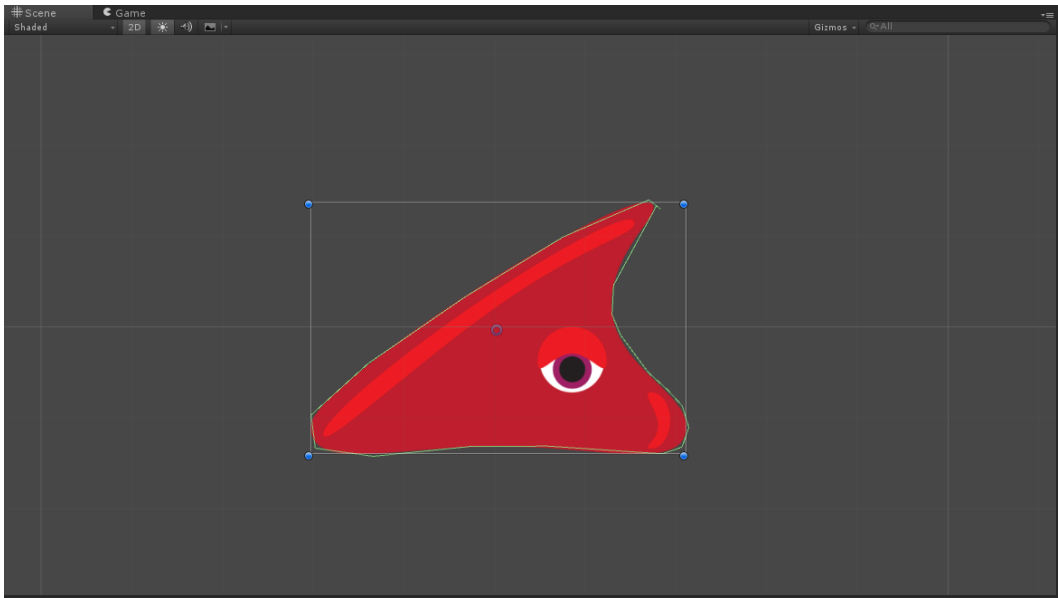
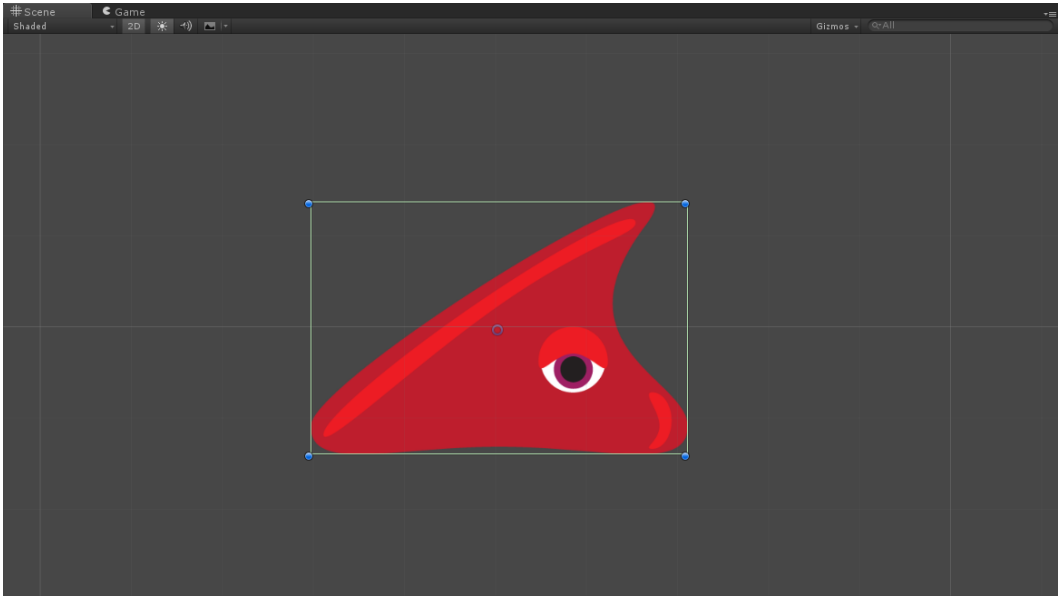






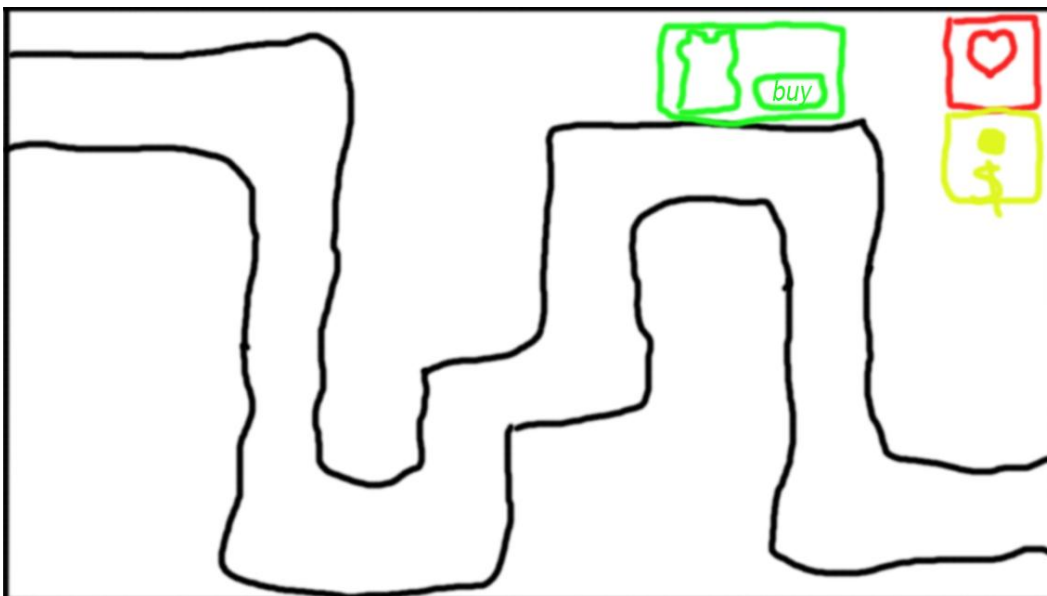
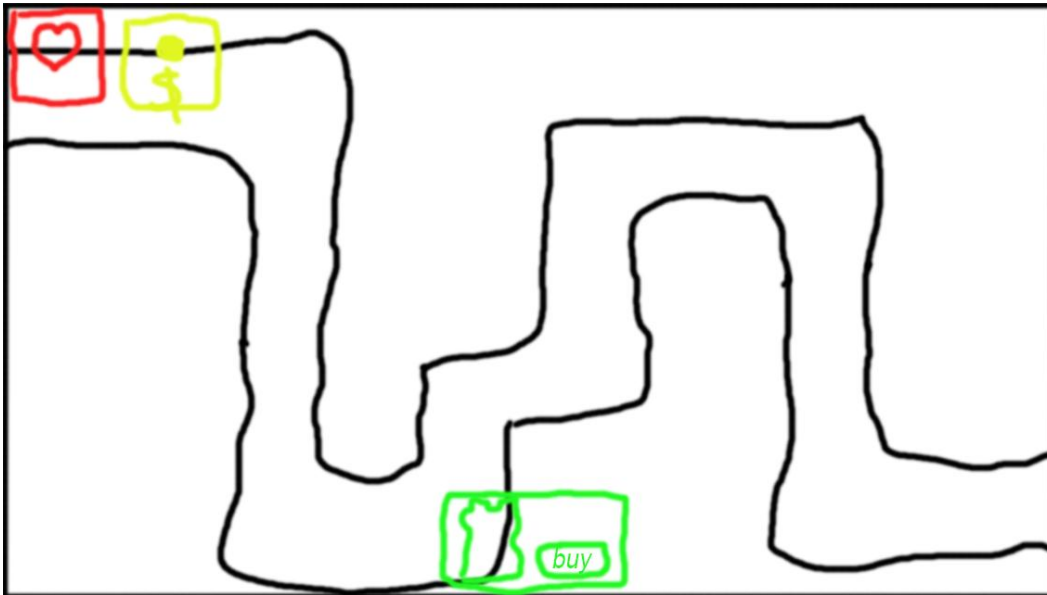








## Chapter 8: User Interface for the Tower Defense game





**T**  Text (Script) ? ⚙️

Text  
100

**Character**

Font: Arial

Font Style: Normal

Font Size: 17

Line Spacing: 1

Rich Text:

**Paragraph**

Alignment: ☰ ☰ ☰ ☰ ☰

Horizontal Overflow: Wrap




Vertical Overflow: Truncate



Best Fit:

Color: ████████████████████ ✎

Material: None (Material)



▼   **Lives Counter Script (Script)**  

Script	 LivesCounterScript 
Max Lives	100



**T**  Text (Script) ? ⚙️

Text  
\$1200

**Character**

Font: Arial

Font Style: Normal

Font Size: 17

Line Spacing: 1

Rich Text:

**Paragraph**

Alignment: ☰ ☰ ☰ ☰ ☰

Horizontal Overflow: Wrap

Vertical Overflow: Truncate

Best Fit:

Color: ████████████████████ ✎

Material: None (Material)







**T**  Text (Script) ? ⚙️

Text  
\$1200

**Character**

Font: Arial

Font Style: Normal

Font Size: 17

Line Spacing: 1

Rich Text:

**Paragraph**

Alignment: ☰ ☰ ☰ ☰ ☰

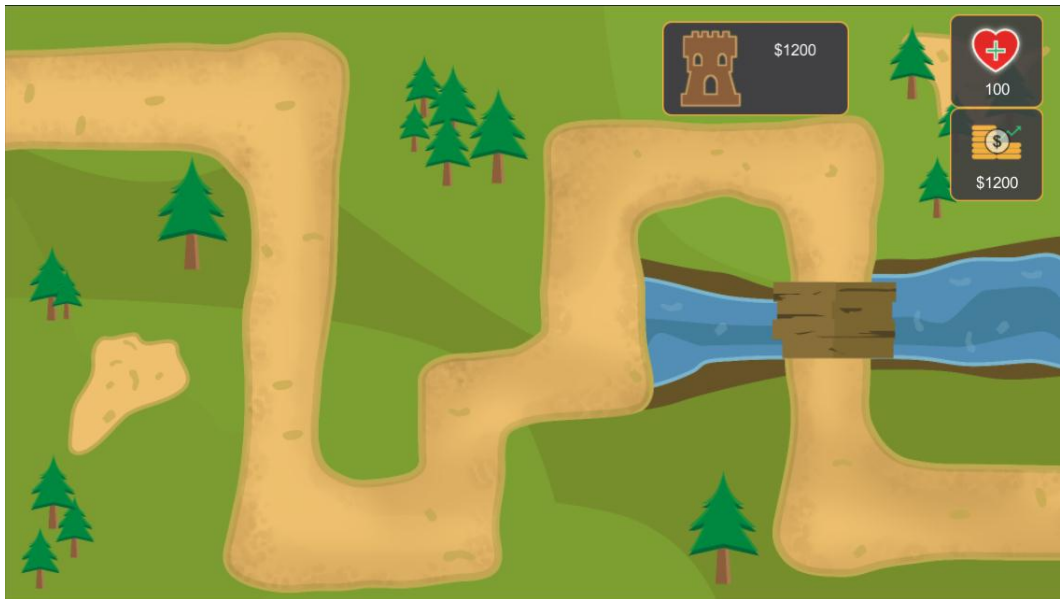
Horizontal Overflow: Wrap

Vertical Overflow: Truncate

Best Fit:

Color: ████████████████████ ✎

Material: None (Material)



▼ **T** ✓ **Text (Script)** ? ⚙️

Text  
buy

**Character**

Font  ⊙

Font Style  ⬇

Font Size

Line Spacing

Rich Text

**Paragraph**

Alignment

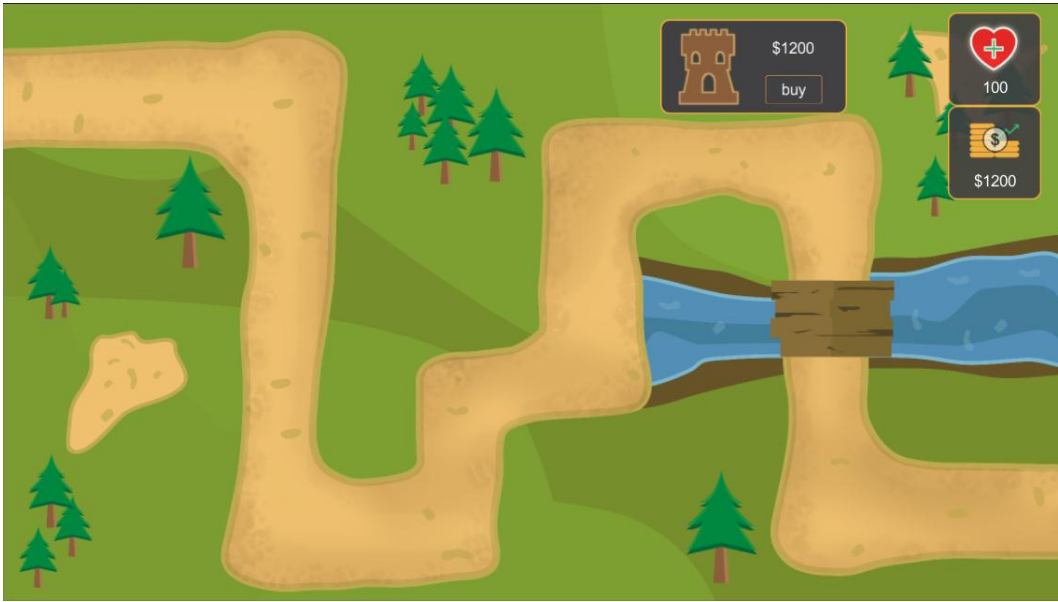
Horizontal Overflow  ⬇

Vertical Overflow  ⬇

Best Fit

Color  ✎

Material  ⊙



**Button (Script)**

Interactable

Transition: Color Tint

Target Graphic: BuyButton (Image)

Normal Color: [Color Picker]

Highlighted Color: [Color Picker]

Pressed Color: [Color Picker]

Disabled Color: [Color Picker]

Color Multiplier: 1

Fade Duration: 0.1

Navigation: Automatic

Visualize

On Click ()

Runtime Only BuyTowerScript.OnClick

BuyButton (Buy)

**Buy Tower Script (Script)**

Script: BuyTowerScript

Ui Price: PriceText (Text)




Price: 1200








Tower Prefab: Tower

















```
▼ TowerMenu
  ▼ UpgradeButton
    UpgradeButtonText
    UpgradePriceText
  ▼ SellButton
    SellButtonText
    SellPriceText
```




▼   **Tower Menu Script (Script)**  


Script	 TowerMenuScript	
Upgrade Price Text	None (Text)	
Sell Price Text	None (Text)	
<b>Level 0 Settings</b>		
Menu Level 0	None (Sprite)	
Upgrade Price Level 0	0	
Sell Price Level 0	0	
<b>Level 1 Settings</b>		
Menu Level 1	None (Sprite)	
Upgrade Price Level 1	0	
Sell Price Level 1	0	
<b>Level 2 Settings</b>		
Menu Level 2	None (Sprite)	
Sell Price Level 2	0	





▼   **Tower Menu Script (Script)**  

Script	 TowerMenuScript 
Upgrade Price Text	 UpgradePriceText (Text) 
Sell Price Text	 SellPriceText (Text) 
<b>Level 0 Settings</b>	
Menu Level 0	None (Sprite) 
Upgrade Price Level 0	0
Sell Price Level 0	0
<b>Level 1 Settings</b>	
Menu Level 1	None (Sprite) 
Upgrade Price Level 1	0
Sell Price Level 1	0
<b>Level 2 Settings</b>	
Menu Level 2	None (Sprite) 
Sell Price Level 2	0


▼   **Tower Menu Script (Script)**  

Script  

Upgrade Price Text  

Sell Price Text  


**Level 0 Settings**

Menu Level 0  

Upgrade Price Level 0

Sell Price Level 0


**Level 1 Settings**

Menu Level 1  

Upgrade Price Level 1

Sell Price Level 1

**Level 2 Settings**

Menu Level 2  

Sell Price Level 2

**Tower Menu Script (Script)**

Script: TowerMenuScript

Upgrade Price Text: UpgradePriceText (Text)

Sell Price Text: SellPriceText (Text)

**Level 0 Settings**

Menu Level 0: tower1\_rect

Upgrade Price Level 0: 500

Sell Price Level 0: 650

**Level 1 Settings**

Menu Level 1: tower2\_rect 2

Upgrade Price Level 1: 900

Sell Price Level 1: 1100

**Level 2 Settings**

Menu Level 2: tower3\_rect

Sell Price Level 2: 1500

**Inspector**

TowerMenu

Static

Tag: Untagged

Layer: UI

**Button (Script)**

Interactable

Transition: Color Tint

Target Graphic: UpgradeButton (Image)

Normal Color: [Color Picker]

Highlighted Color: [Color Picker]

Pressed Color: [Color Picker]

Disabled Color: [Color Picker]

Color Multiplier: 1

Fade Duration: 0.1

Navigation: Automatic

Visualize

On Click ()

Runtime Only TowerMenuScript.upgrade

TowerMenu (Tov)

**Button (Script)**

Interactable

Transition: Color Tint

Target Graphic: SellButton (Image)

Normal Color: [Color Picker]

Highlighted Color: [Color Picker]

Pressed Color: [Color Picker]

Disabled Color: [Color Picker]

Color Multiplier: 1

Fade Duration: 0.1

Navigation: Automatic

Visualize

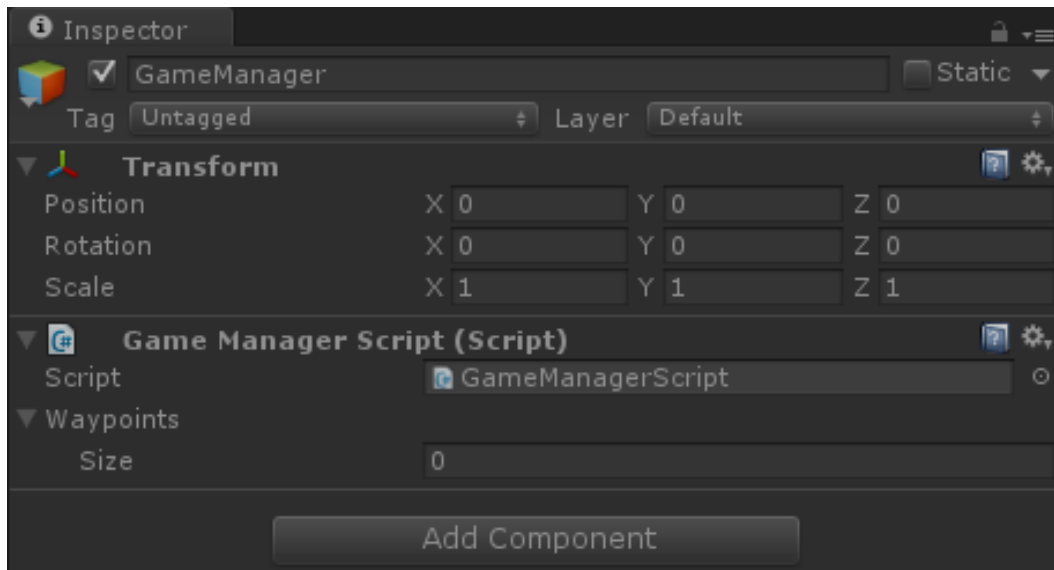
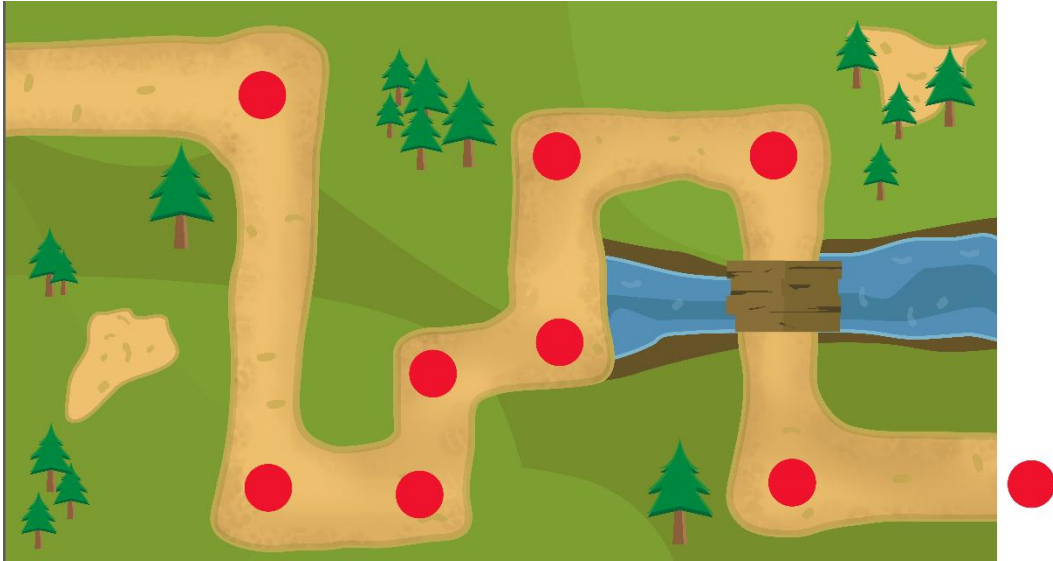
On Click ()

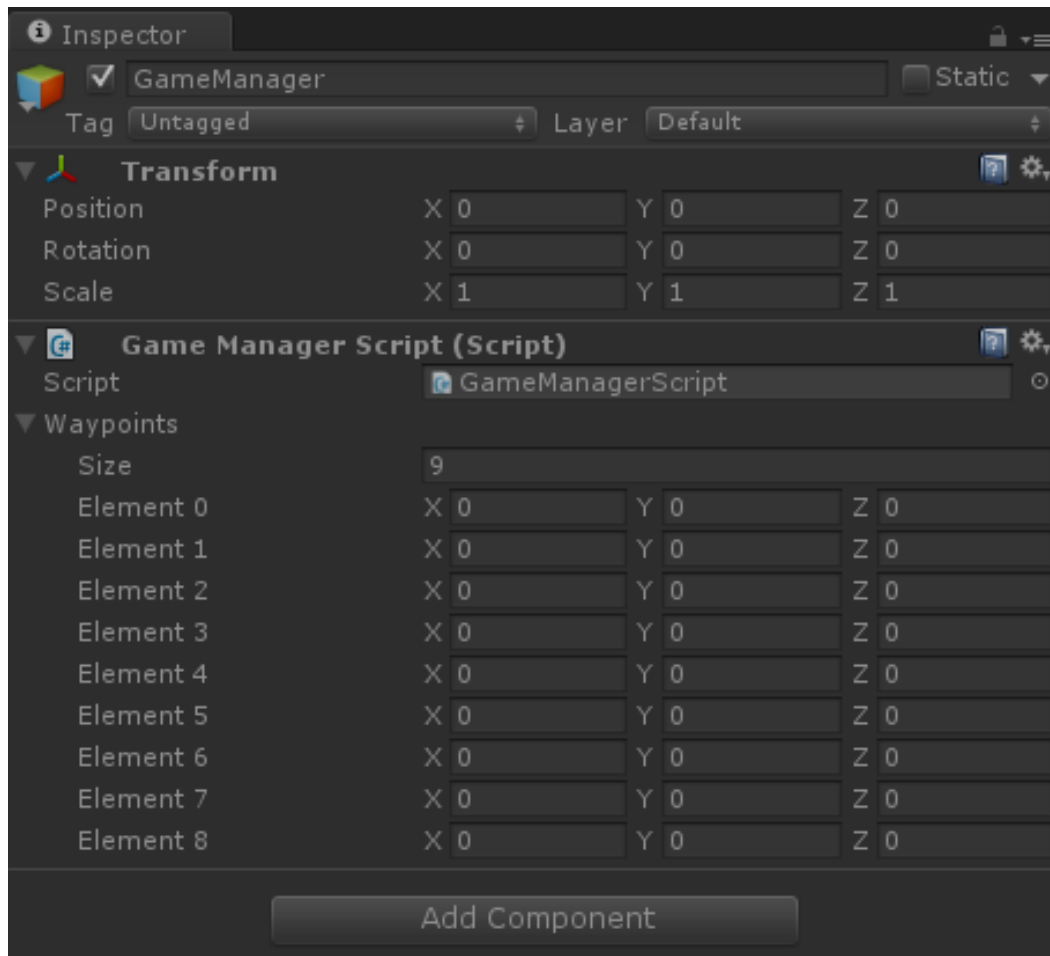
Runtime Only TowerMenuScript.sell

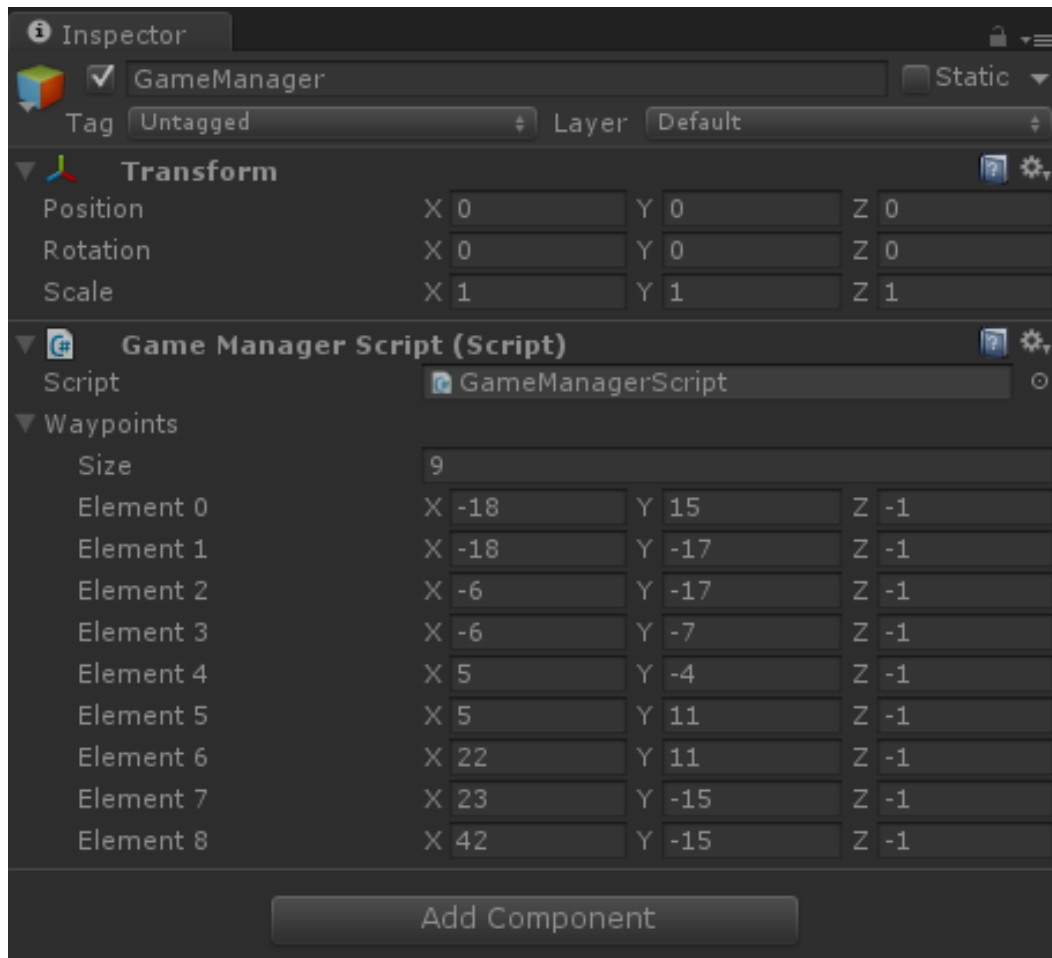
TowerMenu (Tov)

+ -

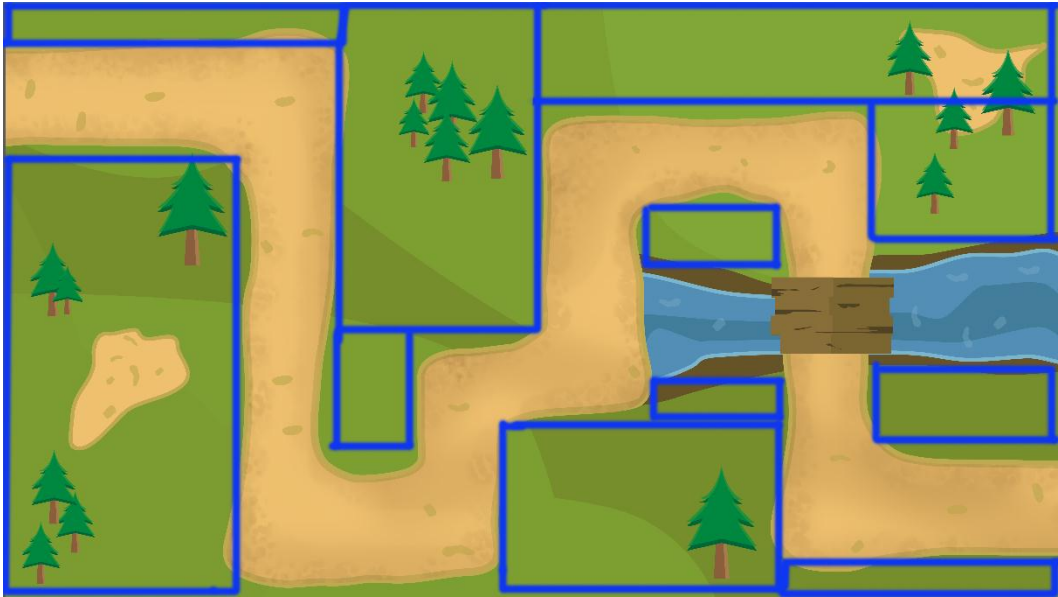
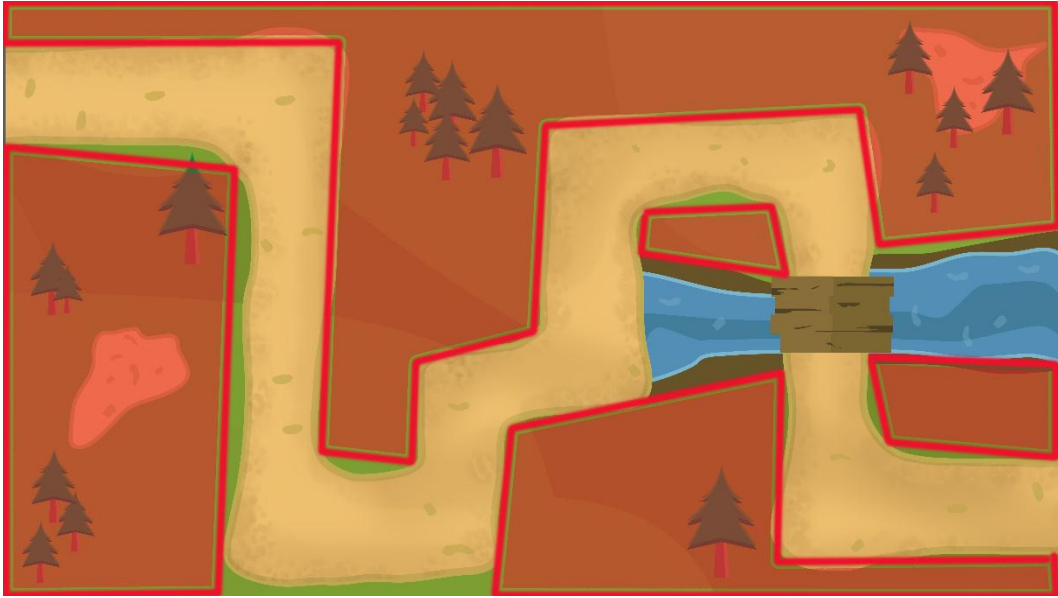
## Chapter 9: Finishing the Tower Defense Game











▼  **Box Collider 2D** ? ⚙

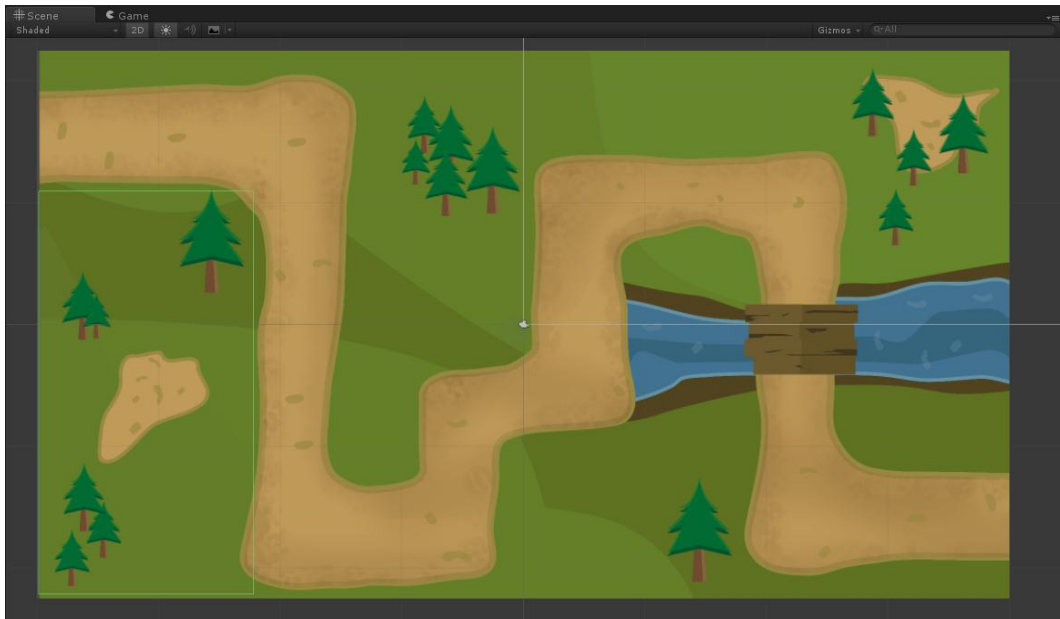
Material: None (Physics Material 2D) ○

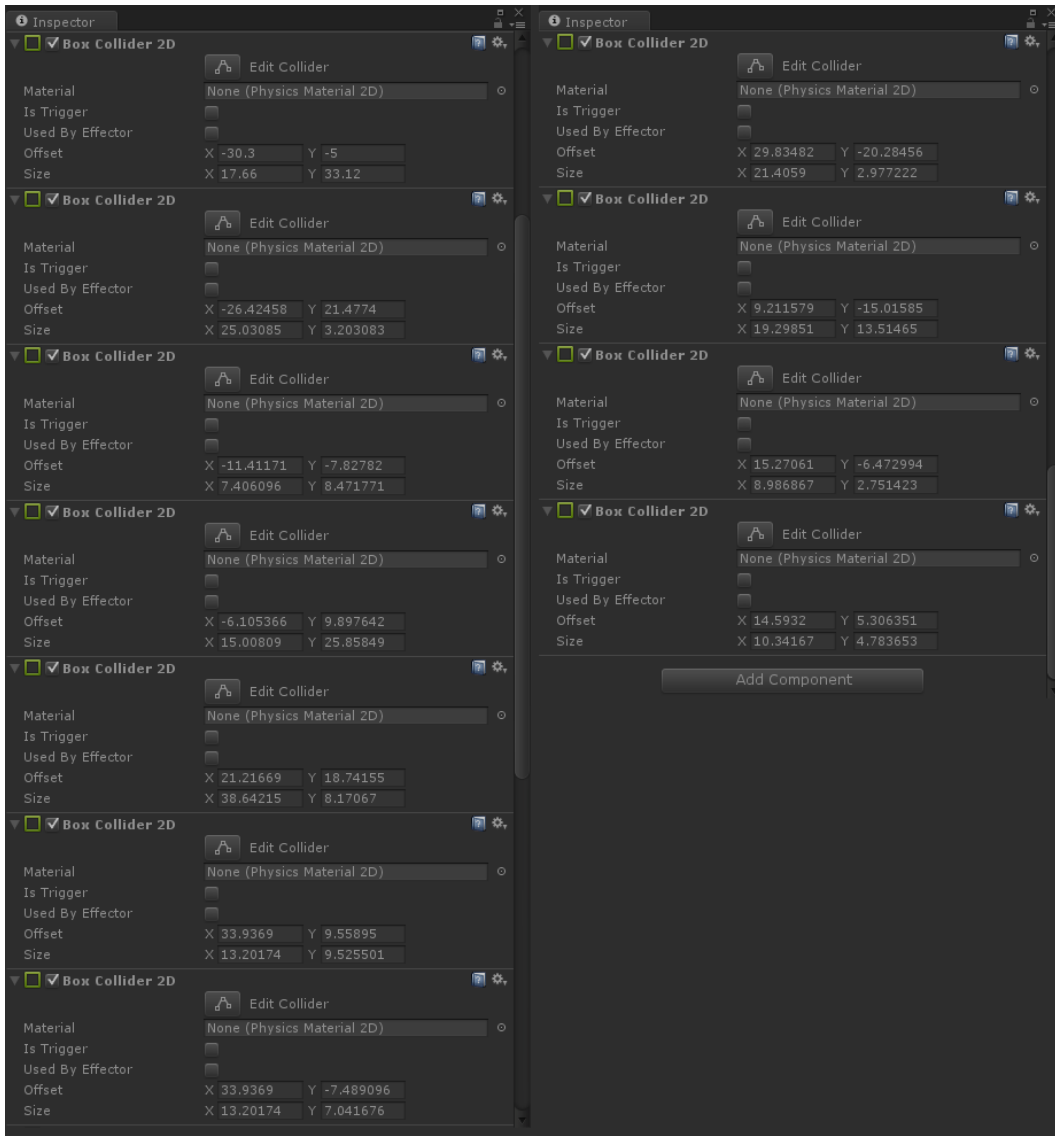
Is Trigger:

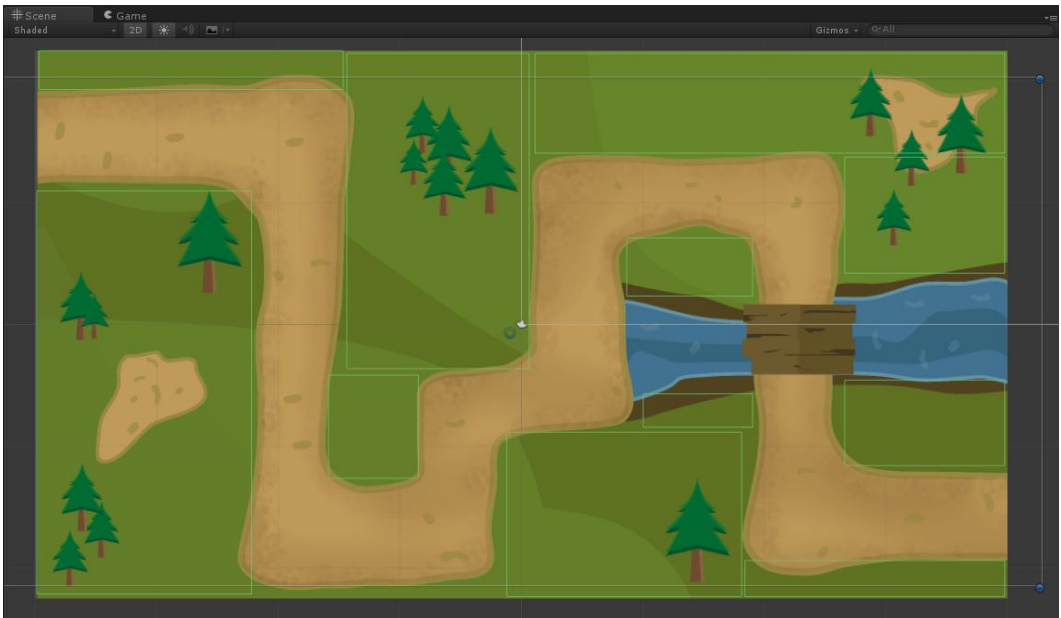
Used By Effector:

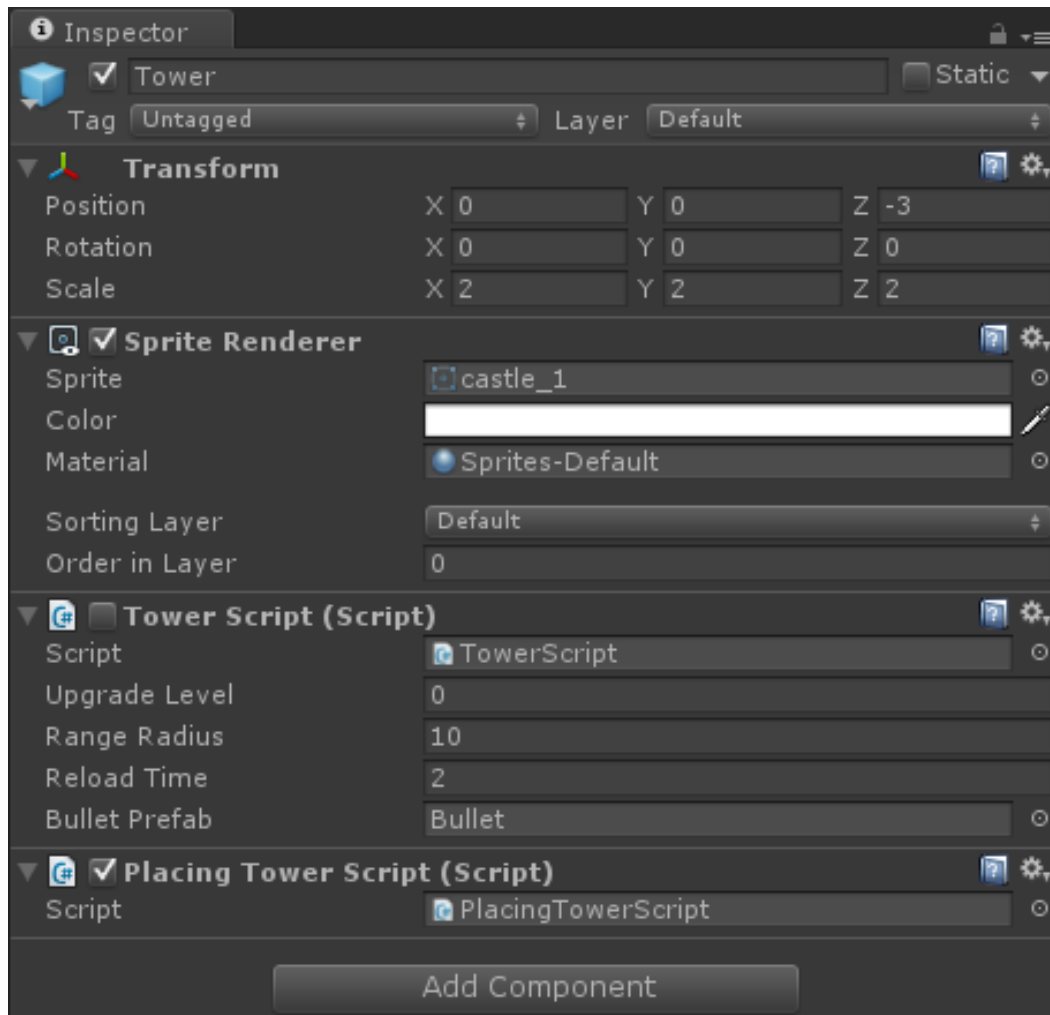
Offset: X -30.3 Y -5

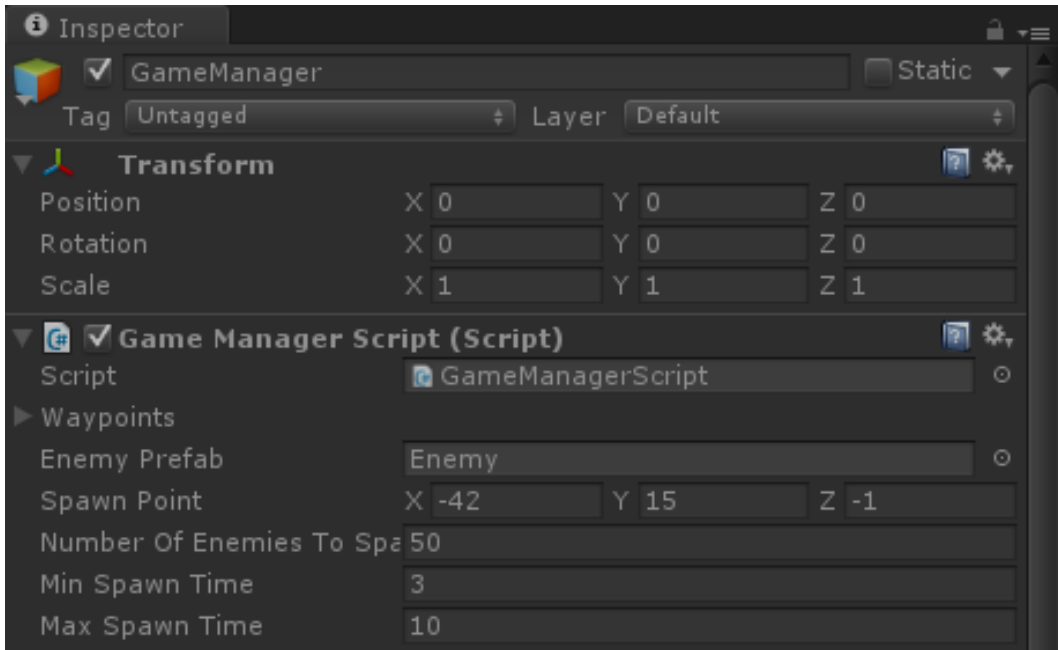
Size: X 17.66 Y 33.12













***A personal note to the reader from Francesco Sapio***

I'm very curious and I look forward to hearing about your creations and about what you have learned from this book. I wish you all the best with your work and maybe our paths will cross again in another book.

Feel free to contact me here [contact@francescosapio.com](mailto:contact@francescosapio.com) or visit my website [francescosapio.com](http://francescosapio.com)