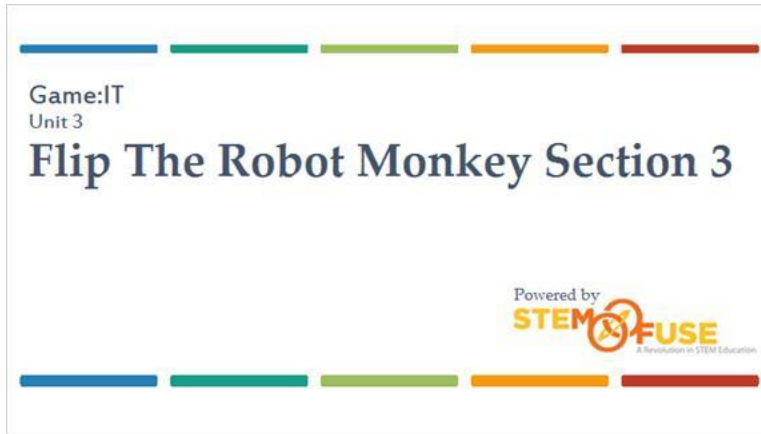


1 - Title Slide: Flip The Robot Monkey Section 3



Game:IT
Unit 3

Flip The Robot Monkey Section 3

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The slide features a decorative border at the top and bottom consisting of five colored horizontal bars: blue, green, light green, orange, and red. The text is centered and uses a serif font for the main title.

2 - Introduction

In the last section you created a large portion of the gameplay. In this section you'll add more gameplay function to the project and put the finishing touches on the game.

Before you start, read the section objectives in the next slide. These objectives will be completed at the end of this section.



The slide contains two paragraphs of text. At the bottom, there is a decorative border consisting of five colored horizontal bars: blue, green, light green, orange, and red.

3 - Section Objective

Section Objectives

During this presentation you'll cover the following objectives

- ◆ Add a New Level
- ◆ Adding an Archer
- ◆ Adding a Boss
- ◆ Start and Game Over Screens



The slide features a title 'Section Objectives' and a subtitle 'During this presentation you'll cover the following objectives'. Below these are four objective items, each with a diamond-shaped icon containing a lightbulb. The icons are colored blue, green, light green, and orange. The text is centered and uses a sans-serif font.

4 - Objective 1: Add A New Level

Objective 1

Add a New Level

To add a new level to the game, you'll need to do a few things. One is to add an exit object to the project that will move the game to the next level.

With your project from section 2 opened go to your layout.

5 - Exit Sprite

Add a new object to the layout. Select the **Sprite** object type and name the object **Exit**. When the cross-hairs appear click near the right edge of the layout to bring up the image editor.

Objective 1 – Add a New Level

6 - Exit Image Editing And Layer

In the image editor, click the **Open** button and select the **Exit** file. No other steps are needed in the editor so you can close it when the image is imported.

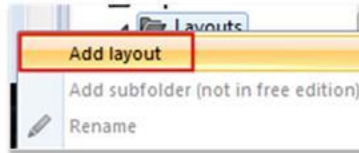
In the layout, make sure the object is on the **Main** layer. Re-position the object in the layout as needed so it appears to be on the Ground object.



Objective 1 – Add a New Level

7 - Adding A New Layout

Next you'll add a new layout to the game that will serve as the next level. In the Projects Bar, right click on the **Layouts** folder and select **Add layout**.



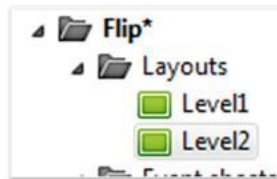
Objective 1 – Add a New Level

8 - New Layout Settings

In the window that appears, select **Don't add event sheet** as you will use the same esLevel event sheet.

Your new layout will appear. Rename the layout to **Level2**.

It is important to name your levels exactly as indicated to prevent errors later in your game.



Objective 1 – Add a New Level

9 - Layout Property Settings

With Level2 select in the Layouts folder go to its Properties Bar. For the event, sheet property set it to **esLevel**. Set the Layout Size to 3600, 720.

Layout properties	
Name	Level2
Event sheet	esLevel
Active layer	Layer 0
Unbounded scrolling	No
Layout Size	3600, 720
Margins	500, 500

Objective 1 – Add a New Level

10.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

Next you'll want to add new layers to the layout. Click the Layers tab and in the layers bar add three new layers. Rename the layers as follows from top to bottom: HUD, Main, Blocks, Background.



[Show Layers Image](#)



10.2 - Layers Image

On Your Own

Complete all the tasks before continuing to the next slide

The free edition of Construct only allows for 4 or less layers. Need more? get the licensed version of Construct and add as many layers as you need.



Layer Name	Count
HUD	3
Main	2
Blocks	1
Background	0

[Get Unlimited Layers](#)


[Hide Layers Image](#)



11 - Parallax Settings

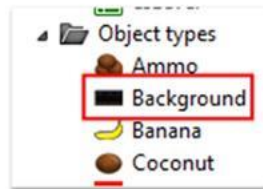
Now you'll need to set the Parallax settings for the HUD and Background layers. Select the HUD layer and set the Parallax to 0, 0. Select the Background layer and set the Parallax to 75, 75.

Objective 1 – Add a New Level



12 - Background Changes

Since the Background and HUD layers will stay the same between levels, you can change a setting for the objects in those layers instead of adding them to the layout.



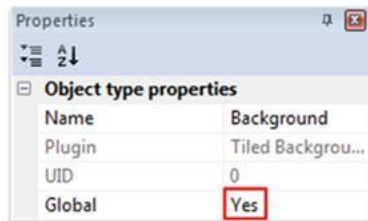
Click the **Projects** tab to bring up the Projects Bar and in the Object Types folder select **Background**.

Objective 1 – Add a New Level

13 - Global Settings

Next go to the Properties Bar and in the Object type properties section set Global to **Yes**.

This will cause the Background to remain when you go to the next level.



Objective 1 – Add a New Level

14 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

- Change the Global property to yes for the TxtAmmo, TxtLives, and TxtScore objects as well.



15 - Adding the Ground Object To Layout 2

Make sure that Blocks is the active layer, go to the Projects Bar, and in the Object Types folder click and drag the **Ground** object onto your Level2 layout. When places set its Position to (0, 720).

Objective 1 – Add a New Level



16 - FallMarker Sprite

For this level, you'll only have a Ground object at the beginning and end of the level. Throughout the rest of the level, Flip will have to travel across platforms and will lose a life if he falls. To detect this fall, you'll need a new object.

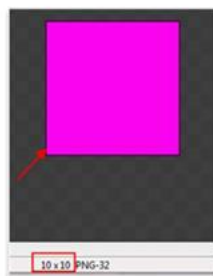
Add a new object to your layout that is a **Sprite** and name it **FallMarker**.

Objective 1 – Add a New Level



17 - FallMarker Image Editor

Click anywhere in the layout with the cross-hairs to bring up the image editor. In the image, editor **Resize** the image to a Width and Height of 10. Next use the **Fill** tool to make the image a bright color, such as pink.



Objective 1 – Add a New Level



18 - FallMarker Property Settings

With the new FallMarker object selected go to the Properties Bar and in the Properties section set the Initial visibility to **Invisible**. Set the Position to (1800, 715) and the Size to 3600, 10. This will set the FallMarker to span the entire bottom of the layout.

Common	
Layer	Blocks
Angle	0
Opacity	100
Position	1800, 715
Size	3600, 10

Having the FallMarker overlapping the Ground will not have any effect on the gameplay as the ground will stop Flip from contacting the FallMarker below itself.

Objective 1 – Add a New Level

19 - Design Your Own Level

Next you'll complete the level to your design. Remember to place Ground and Platform object on the Blocks layer and the other objects on the Main layer. Adding the Background and HUD text object is not required for this layout. To help place Platform object remember to use the Show Grid and Snap to grid features. A width of 55 and height of 40 is best for placing the Platform objects.

Objective 1 – Add a New Level

20.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide



Complete building the level

- Make sure to add the Flip object to beginning of the level and the Exit object at the end as well as the Edge objects
- Add Platforms spanning the level with Knights, EdgeMarkers, Bananas, and Ammo objects



Show Example Level

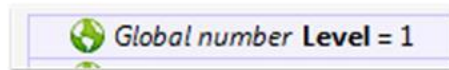
20.2 - Example Level Image



21 - Advancing Levels

Once you have your level built, you're ready to set up the events for advancing levels. Go to your esLevel event sheet.

Add a new Global variable that is named **Level**, is a **Number**, and has an Initial Value of 1 (since you start on the first level).



Objective 1 – Add a New Level

22 - Flip On Collision With Exit


Next, go to the Flip Controls group and add a new sub-event. Use **Flip** as the object and the **On collision with another object** condition. Select **Exit** as the Object in the parameters and click **Done**.



Objective 1 – Add a New Level

23 - New Level Action

Next add an action to your new event that uses the **System** object and the **Add to** action. Select **Level** as the variable and leave the Value as 1.



Objective 1 – Add a New Level

24 - New Level Expression

Add another action to the event that uses the System object. For the action, select Go to layout (by name).

This action will allow you to select a layout to go to using an expression. You'll use the Level variable and a string to indicate the level. In the Layout field input "Level" & Level.

To learn more about Layout Actions [Click Here](#)



Objective 1 – Add a New Level

25 - Explanation Of Expression

How this will work is when you reach the Exit of Level 1 the Level variable will be set to one. The event will add 1 to the Level variable, making it 2. The go to layout action will use this variable to select the 2nd level and go to that level. On the second level this will repeat, giving Level a value of 3 and going to that level, and so on.

Objective 1 – Add a New Level

26 - Testing Level 2

Go to your Level1 layout and then run the layout to test your Exit. When you reach the exit, you'll find that you move on to the next level, and the HUD and Background are visible. If you advance through your second level, you're going to find that the Background will end. This is because the width of the second level is more than the first, and the background width was set to that of the first.

You can fix this issue by adding one event to the event sheet.

Objective 1 – Add a New Level

27 - Setting Level 2 Background

Go to your event sheet and add a new action to the Start of layout event. Select the **Background** object and then the **Set width** action under the **Size & Position** section.

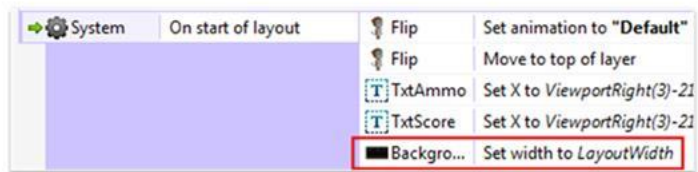


Objective 1 – Add a New Level

28 - Level 2 Width Setting

To make the Background fit the layout simply set the Width field to **LayoutWidth**. This will get the width of the layout when the level starts and set the width of the background to that value.

Click **Done** to insert the action.



Objective 1 – Add a New Level

31 - TxtTimer Text

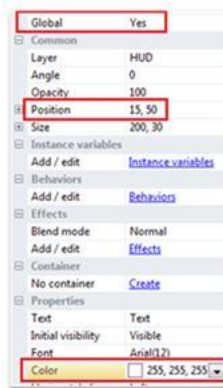
The last thing you'll complete, in the first objective is to add a timer. This timer will give the player 45 seconds to complete each level or else a life will be lost and the level will restart. When the player completes a level, they will gain 10 points for each second left in the timer.

The first thing you'll want to do is add a display for the timer. Go to the Level1 layout and with the HUD layer active add a new object that is **Text** and named **TxtTimer**. Click below the TxtLives object to insert the new object.

Objective 1 – Add a New Level

32 - TxtTimer Property Settings

Change the following properties of the TxtTimer object. Set Global to **Yes**, the Position to (15, 50), and the Color to **White**.



Objective 1 – Add a New Level

33 - Instance Variable Timer

Go back to the event sheet and in the Object Bar select Flip. Add a new instance variable to Flip named **Timer** and set the Initial value to **45**.

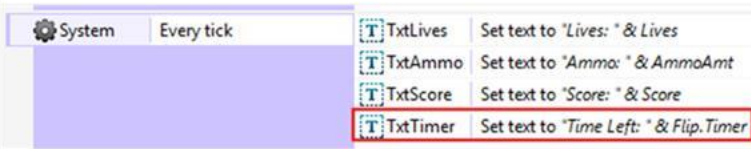
Name	Timer
Type	Number
Initial value	45

You use an instance variable here because at each start of the level you want the timer to reset. Since Flip is created new at each level start the instance variable will have its initial value of 45 for the timer.

Objective 1 – Add a New Level

34 - Set Text TxtTimer

On the Every tick event add a new action that will set the text of **TxtTimer** to "Time Left: " & Flip.Timer.




System	Every tick	T	TxtLives	Set text to "Lives: " & Lives
		T	TxtAmmo	Set text to "Ammo: " & AmmoAmt
		T	TxtScore	Set text to "Score: " & Score
		T	TxtTimer	Set text to "Time Left: " & Flip.Timer

Objective 1 – Add a New Level

35 - System Ever 1 Second

Now you'll set off the event that will decrease the Timer. Add a new event that uses the **System** object and the **Every X seconds** condition. Keep the Interval as 1.0 and click **Done** to add the event.


Move the event between the Every tick event and Flip Controls group.



Objective 1 – Add a New Level

36 - Flip Subtract From Timer

Add an action that uses the **Flip** object and the **Subtract from** action. Set the Instance variable to **Timer** and keep the Value as 1. Click **Done** and insert the action.



Objective 1 – Add a New Level

37.1 - Timer Event

Lastly, you'll add an event that will remove a life and restart the level when the timer reaches zero.

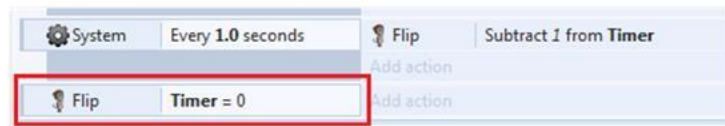
Add a new event that uses the **Flip** object and **Compare instance variable** condition. Set the Instance variable to **Timer**, keep the Comparison as **Equal to** and the Value as 0 and click **Done** to insert the event.

Move this event below the last event you created.

Show New Event

Objective 1 – Add a New Level

37.2 - Timer Event Image



Hide New Event

Objective 1 – Add a New Level

38.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

- ◆ Add two actions to the event. One that will remove 1 from Lives and the other to restart the layout.

Show Timer Event



38.2 - Timer Event Image

On Your Own
Complete all the tasks before continuing to the next slide

Flip	Timer = 0	System	Subtract 1 from Lives
		System	Restart layout

Hide Timer Event



39 - Objective 2: Adding An Archer

Objective 2
Adding an Archer

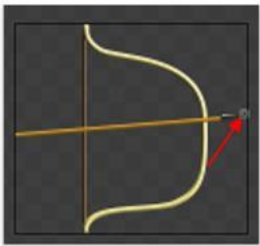
You're now going to add a "ghost" archer to the game. This archer will just consist a bow that will fire an arrow at Flip intermittently. For this you'll need to add two objects: an archer's bow and an arrow.

Go to your Level2 layout.


40 - Archer Sprite

The first object you'll add will be the bow. Add a new object that's a **Sprite** and name it **Archer**. Use the cross-hairs to place the object at the top of the layout.

In the image editor, click the **Open** button and select the **Archer** file. Click the **Image points** tool in the left toolbar. Add a new image point and set its position to the tip of the arrow. Close the image editor when this is done.



Objective 2 – Adding an Archer



41 - Turret Behavior

With the object added you'll add a new behavior to it, the turret behavior. The turret behavior will automatically detect objects in range and rotate towards them and fire.

In the Properties Bar for the Archer object, add the Turret behavior.

To learn more about Turret Behaviors [Click Here](#)



Objective 2 – Adding an Archer

42 - Turret Behavior Settings

In the properties for the Turret behaviors, set the following: Range to 1000, Rate of fire to 5, Predictive aim to Yes, and Projectile speed to 800.

Behaviors	
<input type="checkbox"/> Turret	
Range	1000
Rate of fire	5
Rotate	Yes
Rotate speed	180
Target mode	First in range
Predictive aim	Yes
Projectile speed	800

Objective 2 – Adding an Archer

43 - Turret Explanation

Range is the furthest number of pixels away that the turret can detect a target.

Rate of fire is the number of seconds between when shots are fired.

Predictive aim has the turret try to shoot to where an object is going to be not where it currently is.

Projectile speed is the speed of the fired object and is used in the predictive aim calculations.

Objective 2 – Adding an Archer

44 - Arrow Sprite

Next, you'll add the arrow object. Add a new object to the layout that is a **Sprite** named **Arrow**. Click outside of the layout to insert the object.

In the image editor, click the **Open** button and select the **Arrow** file. Close the image editor when the image imports.

Add the **Bullet** behavior to the object and in the **Bullet** properties set **Speed** to **800**.

The speed of the bullet behavior on the **Arrow** corresponds to the projectile speed used in the **Archer's** turret behavior.

Behaviors	
<input checked="" type="checkbox"/> Bullet	
Speed	800
Acceleration	0
Gravity	0
Bounce off soli	No

Objective 2 – Adding an Archer

45 - Archer And Arrows Group

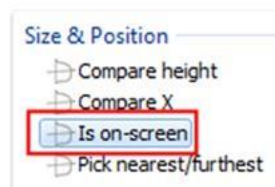
Go to the event sheet and add a new group. Name the group **Archer and Arrow Actions** and set the description to **Set the Archer turret and arrow actions**.



Objective 2 – Adding an Archer

46 - Archer Is On Screen

The first thing you'll need to do is add **Flip** as a target for the **Archer**. Add a sub-event to your new group that uses the **Archer** object and the **Is on-screen** condition under the **Size & Position** section.



Objective 2 – Adding an Archer

47 - Archer Targeting

Add an action to the new event that uses the **System** object and the **Wait** action. Keep the Seconds at 1 and click **Done**.

Add another action that uses the **Archer** object and the **Add object to target** action. For the Target parameter, select **Flip** and click **Done**.

Objective 2 – Adding an Archer

48 - Archer Is Not On Screen

Next you'll want to add an event that will remove Flip as a target if the Archer is off screen.

Add a sub-event to your new group that uses the **Archer** object and the **Is on-screen** action. Right click the condition and select **Invert**.

Objective 2 – Adding an Archer

49 - Archer Clear Targets

Add an action to this event that uses the **Archer** object and select the **Clear targets** action from the Turret section.

Now you'll add the event that will create the Arrow object. Add a new sub-event off the Archer and Arrow Actions group that uses the **Archer** object and the **On shoot** condition.

Objective 2 – Adding an Archer

50 - Archer Spawn Arrow

Add an action to this event that uses the **Archer** object. Select the **Spawn another object** action under the Misc section.

In the Parameter window set Object to **Arrow**, Layer to **2**, and Image point to **1**. Click Done to add the action.



Objective 2 – Adding an Archer

51.1 - On Your Own

On Your Own
Complete all the tasks before continuing to the next slide

- ◆ Add a new event in the group that will destroy the arrow when it collides with a platform
- ◆ Add an event to the group that will destroy the arrow when it is not on-screen.

IT'S YOUR TURN
On Your Own

[Show Arrow Events](#)

51.2 - Arrow Event Image

On Your Own
Complete all the tasks before continuing to the next slide

→ Arrow	On collision with ■ Platform	→ Arrow	Destroy
→ Arrow	✗ Is on-screen	→ Arrow	Destroy

[Hide Arrow Events](#)

52 - Flip Arrow Hits

To add the element to the gameplay, you're going to allow Flip to be hit by two arrows before a life is lost. To set this up, you'll need to add an instance variable to Flip.

In the Objects Bar, select **Flip** and then go to its Properties Bar. Add a new instance variable named **ArrowHits** and set its Initial value to 2.

Instance variables	
JumpBoost	0
Timer	45
ArrowHits	2

Objective 2 – Adding an Archer

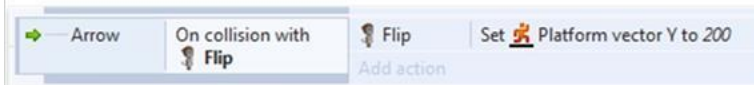
53 - Arrow On Collision With Flip

In your event sheet add a new sub-event to the Archer and Arrow Actions group. Use the **Arrow** object and select the **On collision with another object** condition. Set the object to **Flip** and insert the event.

Objective 2 – Adding an Archer

54 - Flip On Collision With Arrow

You're going to set it so when an Arrow hits Flip he will fall to the ground. Add an action to your new sub-event that uses the **Flip** object and the **Set vector Y** action in the Platform section. Set the Vector Y to 200 and click **Done** to add the action.



Objective 2 – Adding an Archer

55.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

◆ Add another action that will destroy the arrow object and another that will subtract one from Flip's ArrowHit variable. After that, add a sub-event to the Arrow on collision with Flip event that tests if the Flip's ArrowHit variable is equal to zero. If it is, subtract one from Lives and restart the layout.



Show Arrow Event

55.2 - Arrow Event Image

On Your Own

Complete all the tasks before continuing to the next slide

→ Arrow	On collision with Flip	Flip	Set Platform vector Y to 200
		Arrow	Destroy
		Flip	Subtract 1 from ArrowHits
Add action			
Flip	ArrowHits = 0	System	Subtract 1 from Lives
		System	Restart layout

Hide Arrow Event

56 - Adding Archers

Go to your Level2 layout and add 1 or 2 more instances of the Archer to the level. Run the layout a couple times to test how the Archer works.

Soak in this accomplishment, with a save. You deserve it!

Objective 2 – Adding an Archer

57.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

◇ Add a Level3 layout to your project. Include all the objects that you have created so far: Knights, Bananas, Archers, etc. Arrow down for an example.



[Show Example Level](#)



57.2 - Level Example Image

On Your Own

Complete all the tasks before continuing to the next slide



[Hide Example Level](#)



58 - Objective 3: Adding A Boss

Objective 3

Adding a Boss

The next objective in the section is to add a boss and boss level. The boss will be a dragon that will shoot fireballs at Flip. Flip can defeat the dragon by shooting Coconuts at it.

The first thing you'll want to do is add a new layout and objects.

59 - Adding A New Level

Add a new Layout to the project and name it **Level4**. Make sure the set the Event sheet to **esLevel** and set the Layout Size to **1600, 720**. Also, make sure to add the four needed layers.

Make sure to set the parallax settings on the necessary layers.

Layout properties	
Name	Level4
Event sheet	esLevel
Active layer	Layer 0
Unbounded scr...	No
Layout Size	1600, 720

Objective 3 – Adding a Boss

60 - Creating Level

Add Ground objects across the entire level and add two Platforms sections at the very beginning of the level. Make sure both the Ground and Platform are on the Blocks layer.



Objective 3 – Adding a Boss

61 - Adding In Ammo

Next on the Main layer add Flip to the layout and two Ammo object to the top Platform. Also, add Edge objects to each side of the layout.



Objective 3 – Adding a Boss

62 - Boss Sprite

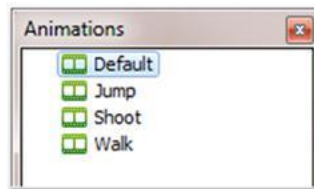
Now you're ready to add the new objects to the layout. The first object you'll add will be the dragon/boss. Add a new object that is a **Sprite** named **Boss**. Click anywhere on the layout with the cross-hairs to bring up the image editor.

Objective 3 – Adding a Boss

63 - Boss Animations

Click the **Open** button and select the **Dragon** file.

Add three new animations to the object and rename them to: **Jump**, **Shoot**, and **Walk**.

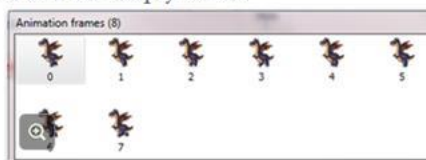


Objective 3 – Adding a Boss

64 - Importing Boss Animations

The Jump and Shoot animations will consist of one image. For the Jump animation, change the image to the **DragonJump** file. For the Shoot animation, change the image to the **DragonShoot** file.

For the Walk animation import the sprite strip file named **DragonWalk**. This strip will consist of 8 horizontal and 1 vertical cell. Make sure to delete the empty frame.



Objective 3 – Adding a Boss

65 - Boss Collision Polygon

In the Properties for the Walk animation change the Speed to 8 and set Loop to **Yes**.

Select the Default animation and select the **Collision Polygon** tool. Right click and select **Set to bounding box** and then **Apply to all animations**.

Objective 3 – Adding a Boss

66 - Left Sidebar Content

The last thing you'll need to do is set an image point on the Shoot animation for where the fireball will appear. Select the Shoot animation and then select the **Image points** tool. Add a new image point and set its position to the left edge of the image in front of the open mouth of the dragon.



Objective 3 – Adding a Boss

67 - Platform Behavior

With the animations set for the Boss object, you can close the image editor. In the Properties Bar, add the **Platform** behavior to the Boss object. In the Platform properties, set the Max speed to 100 and change the Default controls to **No**.

Behaviors	
<input checked="" type="checkbox"/> Platform	
Max speed	100
Acceleration	1500
Deceleration	1500
Jump strength	650
Gravity	1500
Max fall speed	1000
Default controls	No

Objective 3 – Adding a Boss

68 - Instance Variable Action

Like you did with the Knight object you're going to add an instance variable to store the current action of the Boss. You'll also add an instance variable to store the Boss' health.

Add an instance variable named **Action** that is a **Text** type and has an Initial value of **idle**.

Name	Action
Type	Text
Initial value	idle

Objective 3 – Adding a Boss

69.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

◇ Add another instance variable named **Health**. Keep the Type as a **Number** and set the initial value to **5**.

Show Health Variables

69.2 - Health Variable Image

On Your Own

Complete all the tasks before continuing to the next slide

◇

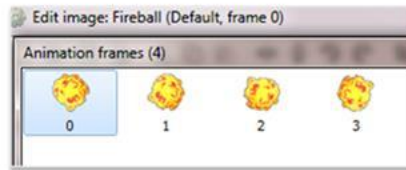
Boss: Instance variables		
Name	Type	Initial value
Action	Text	idle
Health	Number	5

Hide Health Variables

70 - Fireball Sprite

Add a new object that is a **Sprite** and name it **Fireball**. With the cross-hairs click outside of the layout to insert the object and bring up the editor.

In the image editor, import the sprite strip filed named **Fireball** that will have 4 horizontal and 1 vertical cell.



Objective 3 – Adding a Boss

71 - Fireball Property Settings

In the Default animations properties, set the Speed to 8 and Loop to **Yes**. Close the image editor when this is done.

With the Fireball selected, go to the Properties Bar and add the **Bullet** behavior to the object. In the Bullet properties, set the Speed to **-400**.

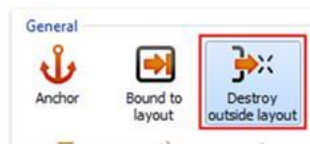
Negative speed in the bullet behavior will cause the object to move left, instead of right, by default.



Objective 3 – Adding a Boss

72 - Destroy Outside Of Layout

Next, add a new behavior to the object. The behavior you'll add will be the **Destroy outside layout** behavior. This behavior will do just like it says, destroy an object when it goes outside the layout.



Objective 3 – Adding a Boss

73 - BossMarker Sprite

You will next add a marker to contain the Boss as it moves. You'll need a new object instead of just reusing the EdgeMarker object because you'll use this object also to prevent Flip from getting too close to the Boss before it's destroyed.

Add a new object that is a **Sprite** and name it **BossMarker**. Click anywhere on the layout to bring up the image editor.

In the image editor, **Resize** the image to a width and height of 10. Use the **Fill** tool and make the object any color, like the markers this object will not be visible when the game is played. Close the image editor when this is done.

Objective 3 – Adding a Boss



74 - Bossmarker Property Settings

With the BossMarker object selected, go to the Properties Bar and change the Initial visibility property to **Invisible**. Set the Size of the object to 10, 720 and its Position to (770,360).

Create a new instance of BossMarker object and set its Position to (1285, 360) and its Size to 10, 720.

Make sure your Boss object is positioned between the BossMarker objects

Opacity	100
Position	770, 360
Size	10, 720
Instance variables	

Objective 3 – Adding a Boss



75 - Wall Sprite

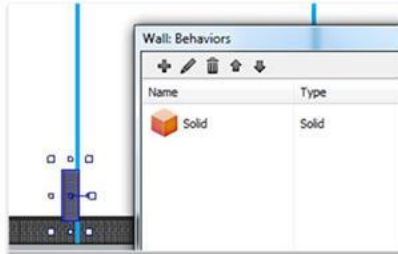
The next object you'll add is a wall that Flip will have to shoot over to damage the Boss. Add a new object that is a **Sprite** and name it **Wall**. Click anywhere to bring up the image editor. In the editor **Open** the **Wall** image file. When the image is imported, close the image editor.

Objective 3 – Adding a Boss



76 - Wall Solid Behavior

With the Wall object selected, set its Position to (755, 615) and add the **Solid** behavior to the object. This behavior will prevent Flip from overlapping the object.



Objective 3 – Adding a Boss

77 – Cage Sprite

The last object you'll add is a cage full of Flip's monkey friends. This will act as an exit for the level and advance the game to the game over screen (which you will add shortly).

Add a new **Sprite** object named **Cage**. Click on the right side of the layout to bring up the image editor.

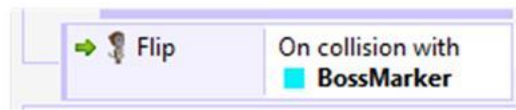
In the image editor import the **Cage** sprite strip. It will consist of 20 horizontal and 1 vertical cell. In the Default animation properties, set the Speed to 20 and Loop to **Yes**. Close the image editor and set the objects position to (1460, 560).

Objective 3 – Adding a Boss

78 - Flip On Collision With BossMarker

You're now ready to move onto setting your events. The first events you'll set will be for Flip and the Boss.

Go to the event sheet and add a new sub-event to the **Flip** Controls group. This event will use the Flip object and the **On collision with another object** event. Set the Object to **BossMarker**.



Objective 3 – Adding a Boss

79 - Flip Set Vector X

Add an action to this event that will use the **Flip** object and **Set vector X** action under the Platform section. In the parameters set Vector X to -500 and click **Done**.

➔ Flip	On collision with BossMarker	Flip	Set Platform vector X to -500
Add action			

Objective 3 – Adding a Boss

80.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

◊ In the Coconut Collisions group, add two sub-events, one for when the Coconut collides with the Wall object and one when the Coconut collides with the Boss. Add an action to both these events that will Destroy the Coconut.

[Show Coconut Event](#)

80.2 - Coconut Event Image

On Your Own

Complete all the tasks before continuing to the next slide

➔ Coconut	On collision with Wall	Coconut	Destroy
Add action			
➔ Coconut	On collision with Boss	Coconut	Destroy
Add action			

[Hide Coconut Event](#)

81 - Testing Boss Health

Now add an action to the Coconut on collision with Boss that will subtract 1 from the Boss' Health variable.

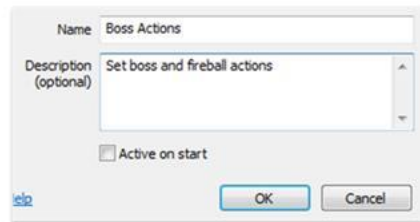
Next, add a sub-event to this event that will test if the Boss' Health variable is equal to 0. Off of this sub-event add actions that will Destroy the Fireball, Boss, and BossMarker.



Objective 3 – Adding a Boss

82 - Boss Actions Group

Now add a new group to the event sheet. Name the group **Boss Actions** with a Description of **Set boss and fireball actions**. For this group **uncheck** the Active on start box. Click **OK** to add the group.



Objective 3 – Adding a Boss

83 - System Every X Seconds

In this group, you're going to use a local variable. Local variables are variables that are only available in the event where it's created and in its sub-events.

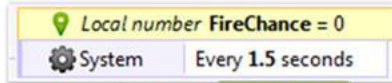
Add a sub-event to the group that uses the **System** object and the **Every X seconds** with the Interval set to 1.5.

Objective 3 – Adding a Boss

84 - Local Variable FireChance

Right click on this sub-event and go to Add and select **Add local variable**. Name the variable **FireChance**, the type can stay **Number**, and the Initial value can remain at its default. Click **Ok** to add your local variable.

You will assign a random number between 0 and 5 to this variable and then test the variable. If the variable is not equal to zero, a fireball object will be created.



To learn more about Local Variables [Click Here](#)

Objective 3 – Adding a Boss

85 - Set Fire Chance Value

Add an action to the Every 1.5 seconds event that uses the **System** object and the **Set value** action. Select **FireChance** as the Variable. For the Value field input **floor(random(6))**. Click **Done** to add the action.



The random(6) portion of the expression will generate a random number between 0 and 5. Since this number will be a decimal value the floor portion of the expression will round the number down to the nearest whole.

Objective 3 – Adding a Boss

86.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

- ◆ Add a sub-event to this event the Every 1.5 seconds event that tests if FireChance is not equal to 0. Add an action to this sub-event that sets the animation of the Boss object to Shoot. Add another action that will use the Boss object to spawn a Fireball object on Layer 2 and at image point 1.



Show FireChance Event

86.2 - FireChance Event Image

On Your Own
Complete all the tasks before continuing to the next slide

System	FireChance \neq 0	Boss	Set animation to "Shoot" (play from beginning)
		Boss	Spawn  Fireball on layer 2 (image point 1)

[Hide FireChance Event](#)



87 - Fireball Angle Of Motion

Since the point where the Fireball object will be created is higher than Flip, you will want the Fireball to travel downwards towards Flip.

Add an action to your sub-event that uses the Fireball object and the **Set angle of motion** under the Bullet section. Set the Angle to 170 and click **Done** to add the action.

 Fireball	Set  Bullet angle of motion to 170 degrees
--	---

Objective 3 – Adding a Boss



88 - Testing Your Layout

If you try running the layout to test, you'll see that the Boss will not spawn a Fireball. This is because the group is set to inactive, which will disable the events in that group. To fix this, you'll add an event that will activate the group if the Boss is in the layout.

Objective 3 – Adding a Boss



89 - Boss Is Visible

Go to the event sheet and add a sub-event to the start of layout event.
For the object select **Boss** and the **Is visible** condition



Objective 3 – Adding a Boss

90 - Setting Boss Actions Activated

Add an action to this sub-event that uses the **System** object and the **Set group active** action under the General section. Set the Group name to **"Boss Actions"** and keep the State as **Activated**. Click **Done** to add the action.



Next you'll add an event that will set the Boss' Action. Unlike the Knight, who just walked back and forth, the Boss will randomly perform an action.

Objective 3 – Adding a Boss

91.1 - Boss Movement

Add a sub-event to the Boss Actions group that will fire every second. Now add an action that will set the Boss objects Action variable to `choose("left", "right", "up", "up", "wait")`.

Show Parameters and New Event

The choose action will randomly pick one of the listed strings and set it as the Action variable. Up is listed twice to increase the frequency it's chosen.

Objective 3 – Adding a Boss

91.2 - Parameters Image

Hide Parameters and New Event

System Every 1.0 seconds Boss Set Action to choose("left", "right", "up", "up", "wait")

Add action

Parameters for Boss: Set value

Choose the instance variable to change.

Instance variable:

Value:

[Help on expressions](#)

Objective 3 – Adding a Boss

92.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

- ◇ Add three events that will test if the Boss' Action variable equals: "left", "right", and "up"
- ◇ Add an action to these events that will simulate pressing the: Left, Right, Jump
- ◇ Add an action to the left and right events that will set Boss' animation to Walk

92.2 - Boss Action Events Image


On Your Own

Complete all the tasks before continuing to the next slide

	Action = "left"		Simulate Platform pressing Left
	Action = "right"		Set animation to "Walk" (play from beginning)
	Action = "up"		Simulate Platform pressing Right
			Set animation to "Walk" (play from beginning)
			Simulate Platform pressing Jump

93 - Action Up Boss Actions

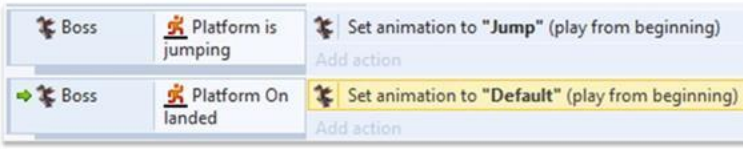
With those events created, add two sub-events to the Action equals up event. One that will fire when the Boss object jumps and one when the Boss object lands.



Objective 3 – Adding a Boss

94 - Boss On Platform Landed


Add an action to the On jump event that will set the Boss' animation to Jump. Next, add an action to the On landed event that will set the Boss' animation to Default.



Objective 3 – Adding a Boss

95 - Boss Is Overlapping BossMarker

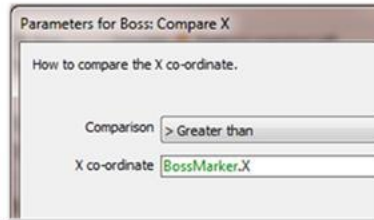
You'll now add events that will reverse the Boss' direction when it reaches the BossMarker object. Add a sub-event to the Boss Action group that uses the Boss object and the **Is overlapping another object** condition. Select **BossMarker** as the Object and click **Done** to add the event.



Objective 3 – Adding a Boss

96 - Boss Compare X

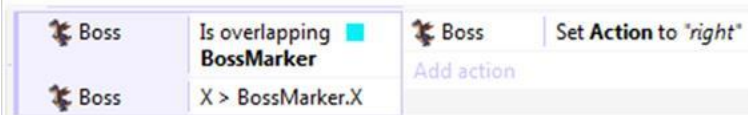
Now you'll add a condition to this event that will test if the Boss object is to the right of the BossMarker object. Add a condition that uses the **Boss** object and the **Compare X** condition. In the Parameters window set the Comparison to **Greater than** and the X coordinate to **BossMarker.X**.



Objective 3 – Adding a Boss

97 - Set Boss Action To Right

Add an action to this event that will set the Boss' Action variable to "right".



Objective 3 – Adding a Boss

98.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide




- ◆ Add an event that will set the Action to "left" when the Boss is overlapping BossMarker and it's X is less than that of BossMarker's.

Show BossMarker Event




98.2 - BossMarker Event Image

On Your Own
Complete all the tasks before continuing to the next slide

 Boss	Is overlapping <input checked="" type="checkbox"/> BossMarker	 Boss	Set Action to "left"
 Boss	X < BossMarker.X	Add action	

Hide BossMarker Event




99 - Testing Your Layout

If you run the layout, you'll see that the Boss will now move left and right as well as the jump. The last thing you'll need to do is set up the events for the Fireball

You'll add three events for the Fireball object and they will all be sub-events on the Boss Actions group.

Objective 3 – Adding a Boss



100 - On Your Own

On Your Own
Complete all the tasks before continuing to the next slide

- ◇ Add an event that will destroy the Coconut when it collides with the Fireball
- ◇ Add an event that will destroy the Fireball when it collides with the Wall



101.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

◇ Add an event for when the Fireball collides with Flip that will destroy the Fireball, subtract 1 from Lives, wait 1 second and then restart the Layout.

Show Fireball Events



101.2 - Fireball Event Image

On Your Own

Complete all the tasks before continuing to the next slide

Fireball	On collision with	Coconut	Coconut	Destroy	
				Add action	
Fireball	On collision with	Wall	Fireball	Destroy	
				Add action	
Fireball	On collision with	Flip	Fireball	Destroy	
				System	Subtract 1 from Lives
				System	Wait 1.0 seconds
				System	Restart layout

Hide Fireball Events




102 - Quiz

Which object behavior is responsible for tracking sprites?

- Solid Behavior
- Platform Behavior
- Bullet Behavior
- Turret Behavior

Quiz Time



103 - Objective 4: Start And Game Over Screens

Objective 4

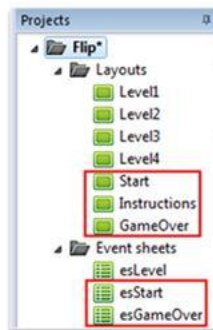
Start and Game Over Screens

To complete your game, you're going to add start, instructions, and game over screens.

Add the three layouts to your games. Name them Start, Instructions, and Game Over. Start and Instructions will share the same event sheet named esStart and Game over will have its own esGameOver event sheet.

104 - Layout Settings

Here is how your layouts and events sheets should look. Each layout will have two layers: Background and Main. The Layout Size of each layout should be 1280, 720.



Objective 4 – Start and Game Over Screens

105.1 - Start Screen

Go to the Start layout and on the Background layer add a new object. Make the object a **Sprite** and name it **StartBG**. Click on the top left corner, of the layout to bring up the image editor.

Click the **Open** button in the editor and select the **FlipBG-Start** file. Set the origin to the **Top-left** and close the editor. Set the position to (0, 0).

You can easily assign the image point to the top left by right clicking on the image point and going to Quick assign, Top-Left.

[Show Example Of Start Screen](#)

Objective 4 – Start and Game Over Screens

105.2 - Start Screen Image



Hide Example Of Start Screen

Objective 4 – Start and Game Over Screens

106.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

Repeat the same step on the Instruction layout naming the object InstructBG and using the FlipBG-Instructions. Also add the background for the GameOver layout, naming it GameOverBG and using the FlipBG-GameOver file.



Show Example Of Instructions and Game Over Screens

106.2 - Instructions and Game Over Image

On Your Own

Complete all the tasks before continuing to the next slide



Hide Example Of Instructions and Game Over Screens

107 - PlayBtn Sprite

Go back to the Start layout and add a new object that is a **Sprite** named **PlayBtn**. Click above the knight image in the background to bring up the image editor. Set the image to the **PlayButton** file and close the image editor.

Objective 4 – Start and Game Over Screens

108 - InstructionBtn Sprite

Use the same steps to add the **InstructionsBtn** object. Position it above the boss in the background and use the **InstructionsButton** file.



Objective 4 – Start and Game Over Screens

109 - Mouse Object

Go to the Instructions layout and create an instance of the **PlayBtn** object below the displayed instructions. In order to be able to click the buttons with the mouse, you'll need to insert the **Mouse** object into the game. This can be done the same way you add a sprite or text object. Once the mouse object is inserted open the **esStart** event sheet.



Objective 4 – Start and Game Over Screens

110 - Mouse On Object Clicked

You'll now set up the events for when the buttons are clicked. Add a new event that uses the **Mouse** object and **On object clicked** condition.



To learn more about the Mouse Object [Click Here](#)

Objective 4 – Start and Game Over Screens

111 - Mouse On PlayBtn Clicked

In the Parameters window set the Object clicked to **PlayBtn**. You can leave the other parameters at their defaults and click **Done**.

Add an action to this event that uses the **System** object and the **Go to layout** action. Select **Level1** as the Layout and click **Done**.



Objective 4 – Start and Game Over Screens

112 - Set Background Visible

You next have to add an action that will set the Background visible. This is needed because as you'll see you're going to set the Background and HUD items invisible on the GameOver layout.

Add an action that uses the **Background** object and the **Set visible** action. Click **Done** in the Parameters window to add the action.

Objective 4 – Start and Game Over Screens

113.1 - On Your Own

On Your Own

Complete all the tasks before continuing to the next slide

- ◇ Add actions that will set the HUD text objects visible, except the TxtScore
- ◇ Add an event that will go to the Instructions layout when the InstructionsBtn is clicked



Show the HUD Events



113.2 - HUD Events Image

On Your Own

Complete all the tasks before continuing to the next slide

Mouse	On Left button Clicked on PlayBtn	System	Go to Level1
		Backgro...	Set Visible
		TxtAmmo	Set Visible
		TxtLives	Set Visible
		TxtTimer	Set Visible
		Add action	
Mouse	On Left button Clicked on InstructionsBtn	System	Go to Instructions
		Add action	

Hide the HUD Events



114.1 - HUD Actions

To ensure that the HUD text objects will appear on the correct layer when the game restarts you'll need to add actions to the esLevel event sheet.

On the start of layout event for the esLevel event sheet add an action that uses the **TxtAmmo** object and **Move to layer** action under the Z-Order section. Set the Layer parameter to "HUD".

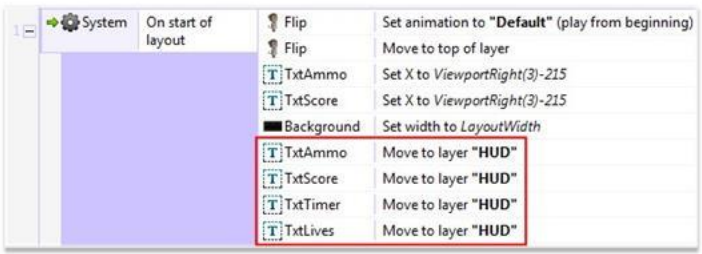
Add the same action for the other 3 HUD text object as well.

Show HUD Events

Objective 4 – Start and Game Over Screens



114.2 - HUD Actions Image



The screenshot shows an event sheet for the 'On start of layout' condition. The actions listed are:

Object	Action	Value
Flip	Set animation to "Default" (play from beginning)	
Flip	Move to top of layer	
TxtAmmo	Set X to ViewportRight(3)-215	
TxtScore	Set X to ViewportRight(3)-215	
Background	Set width to LayoutWidth	
TxtAmmo	Move to layer "HUD"	
TxtScore	Move to layer "HUD"	
TxtTimer	Move to layer "HUD"	
TxtLives	Move to layer "HUD"	

Below the event sheet is a green button labeled 'Hide HUD Actions'. At the bottom, there is a progress bar for 'Objective 4 - Start and Game Over Screens' with five colored segments (blue, green, yellow, orange, red).

115 - Game Over PlayAgainButton

Next go to the GameOver layout and add a **Sprite** that is named **PlayAgainBtn**. Place the object below the window in the background on the right side of the layout.

In the image editor, use the **PlayAgainButton** file.




Objective 4 - Start and Game Over Screens

116 - On Start Of Layout

Open the esGameOver event sheet and add an event that has the **On start of layout** condition.

Add actions that will set the Background and the HUD objects, except the TxtScore object, invisible. Also add an action that will set the Boss Actions group to deactivated.



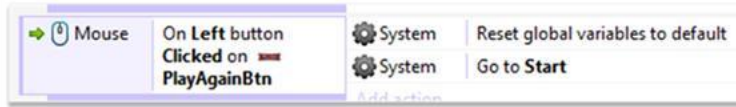
The screenshot shows an event sheet for the 'On start of layout' condition. The actions listed are:

Object	Action	Value
Backgro...	Set Invisible	
TxtAmmo	Set Invisible	
TxtLives	Set Invisible	
TxtTimer	Set Invisible	
System	Set group "Boss Actions" Deactivated	

Below the event sheet is a progress bar for 'Objective 4 - Start and Game Over Screens' with five colored segments (blue, green, yellow, orange, red).

117 - Mouse On PlayAgainBtn Clicked

Next add a new event using the **Mouse** object for when the **PlayAgainBtn** is pressed. Add an action that uses the **System** object and the **Reset global variables** action. Also add an action that will go to the **Start** layout.



Objective 4 – Start and Game Over Screens

118 - Game Over

Go to the esLevel event sheet and add an event that will check if the Lives variable is equal to or less than 0. Add an action to this event to go to the GameOver layout. Also, add a sub-event onto the Flip Controls group for when Flip collides with the Cage object. Add an action to the event to go to the GameOver layout.

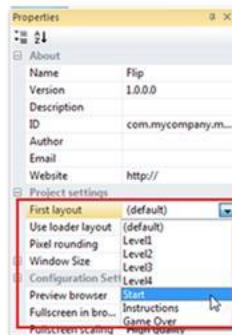


Objective 4 – Start and Game Over Screens

119 - Setting First Layout

The final step in the game is to set the Start screen as the First Layout.

Under the project properties bar, change the First Layout to Start instead of Default.



Objective 4 – Start and Game Over Screens

120 - Play The Game!



121 - Success

