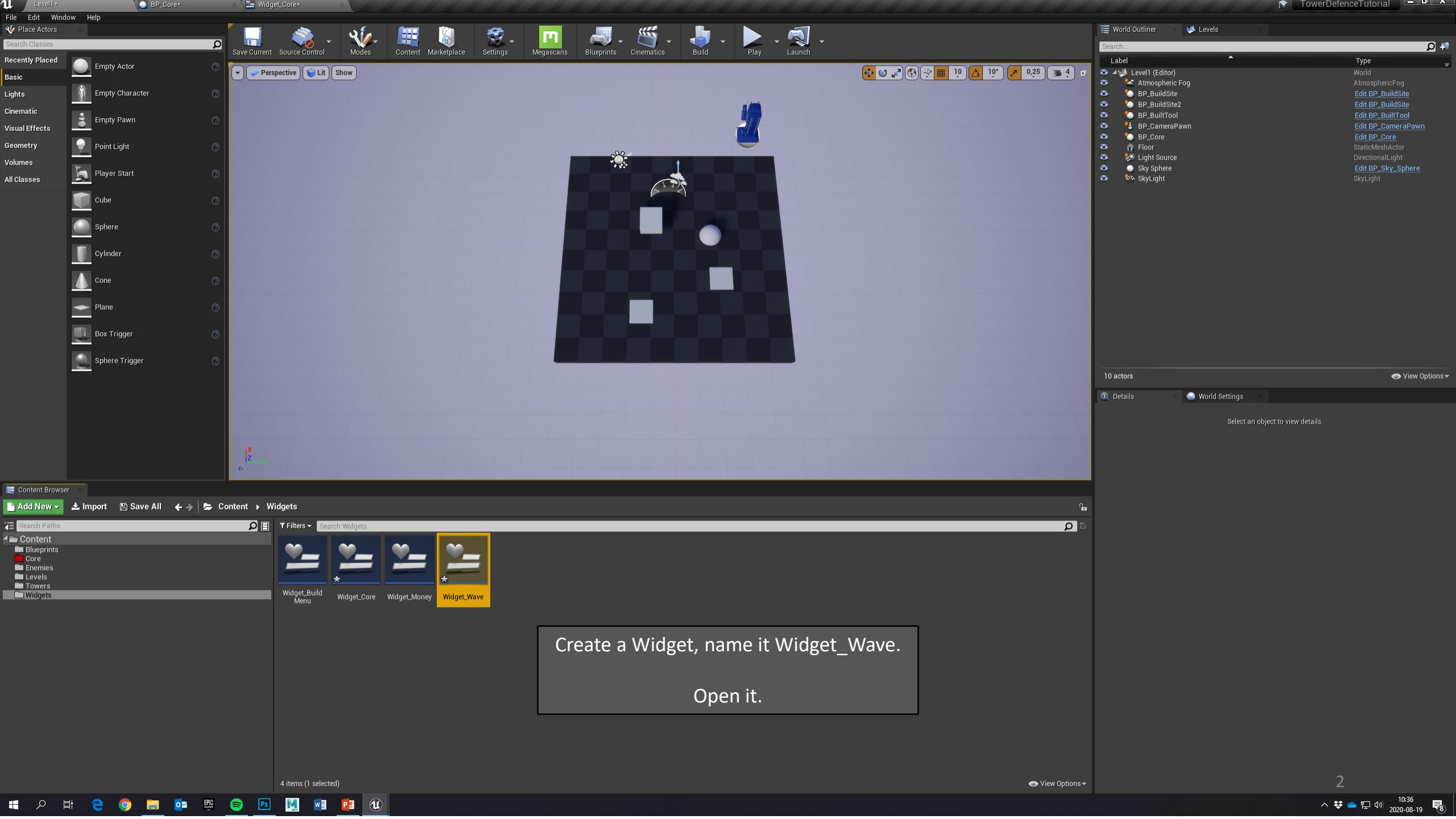
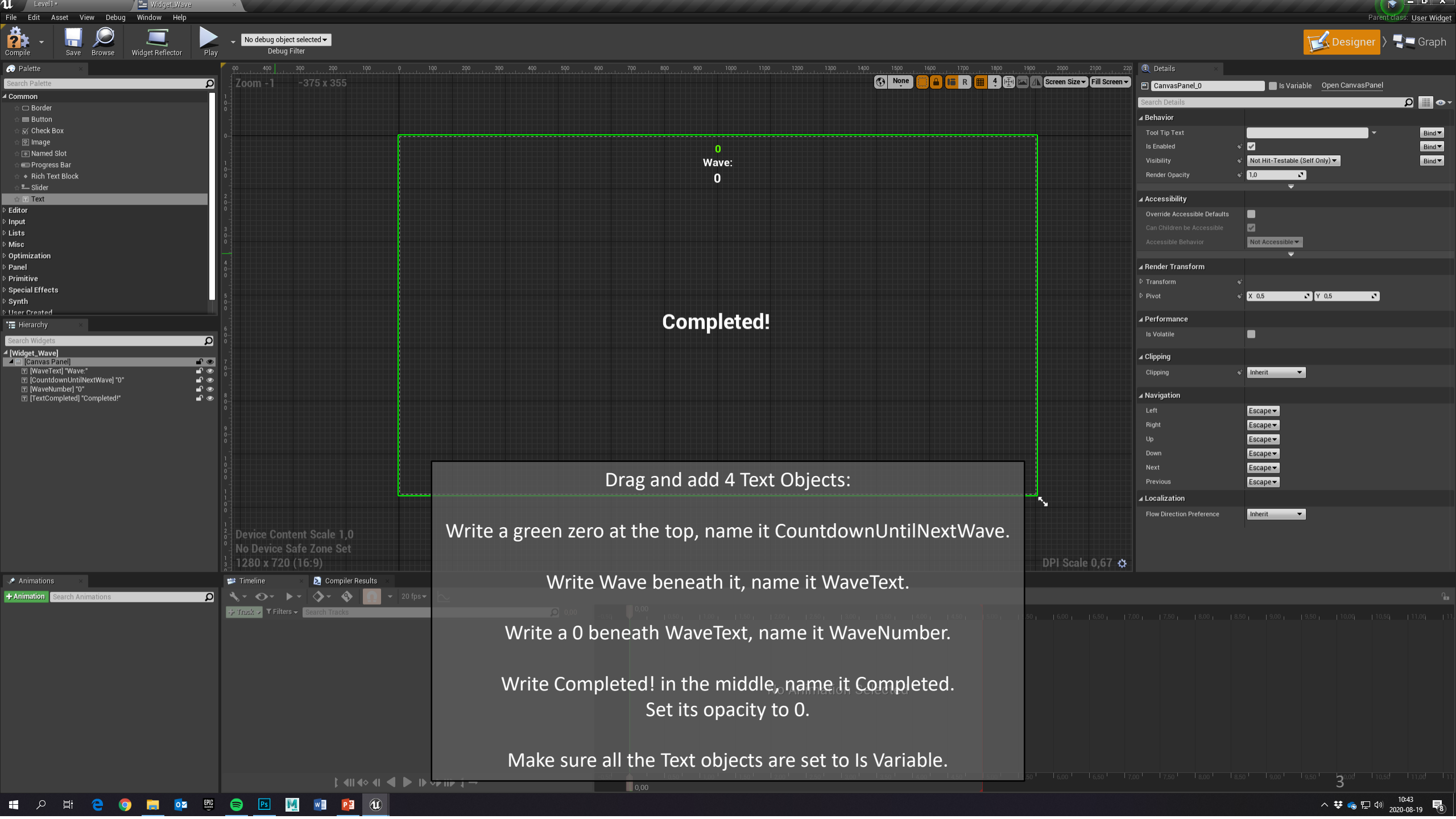
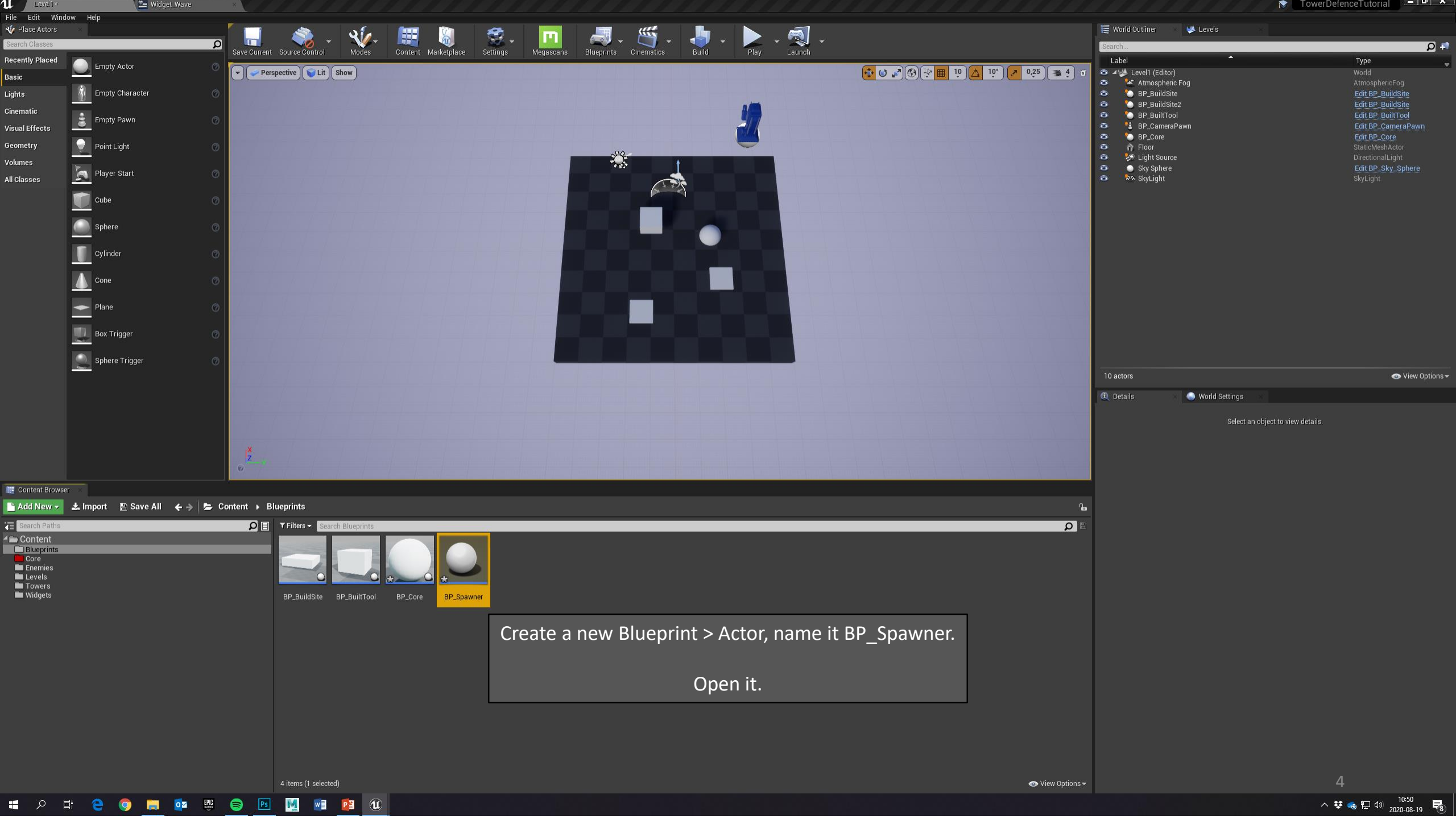
Tower Defence

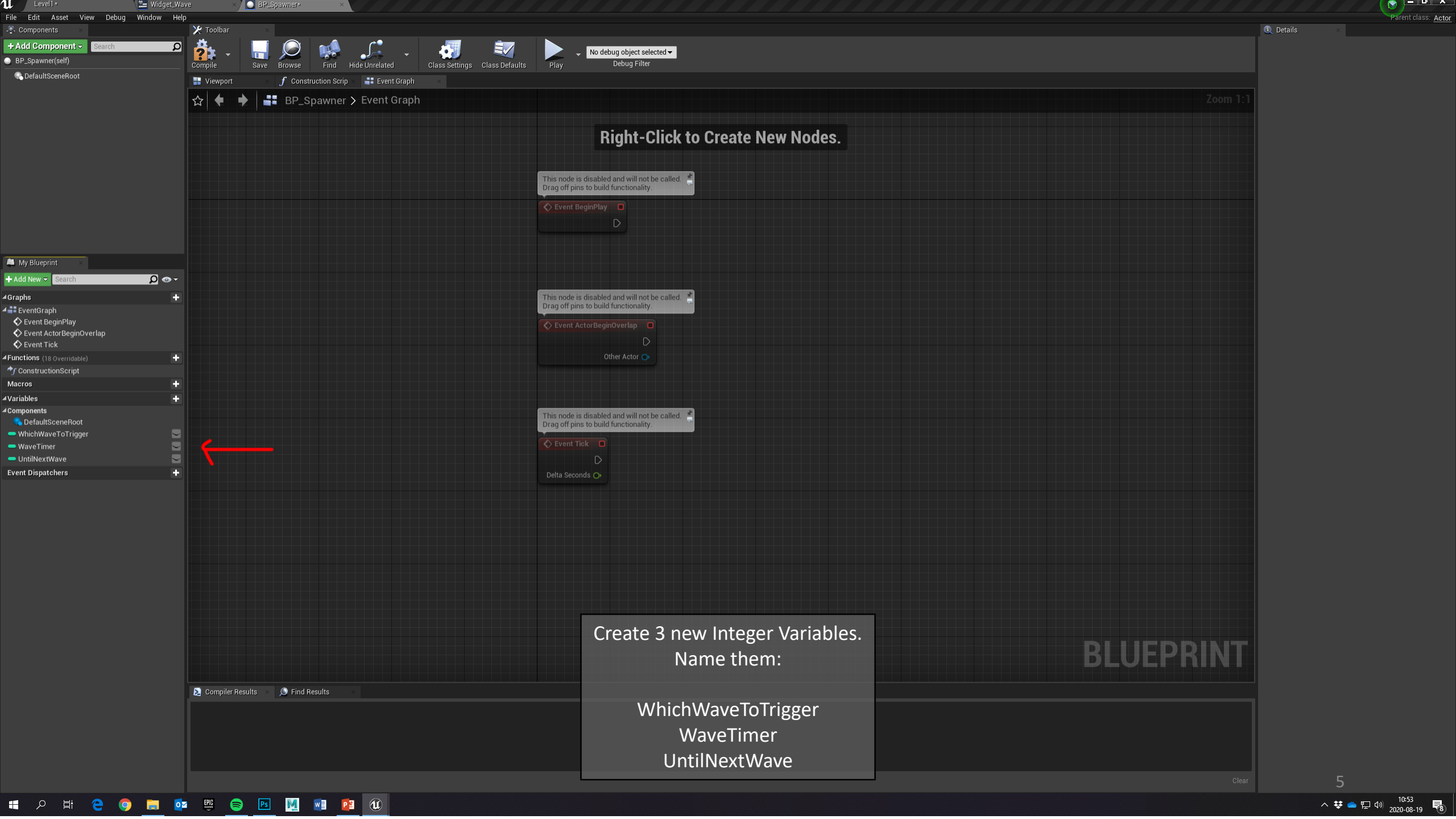
Waves

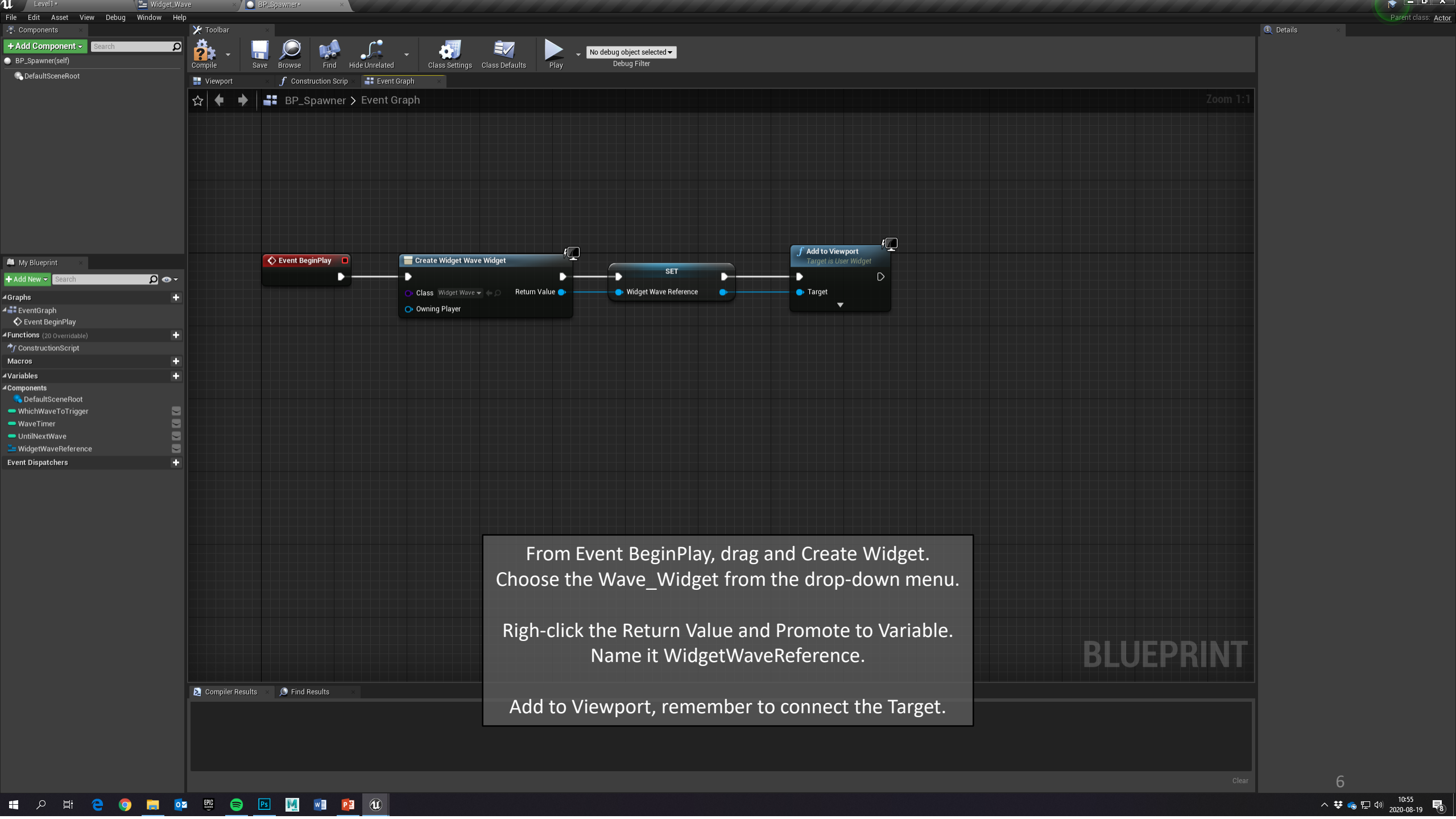
Mårten Jonsson
jm-j.com
marten@jm-j.com

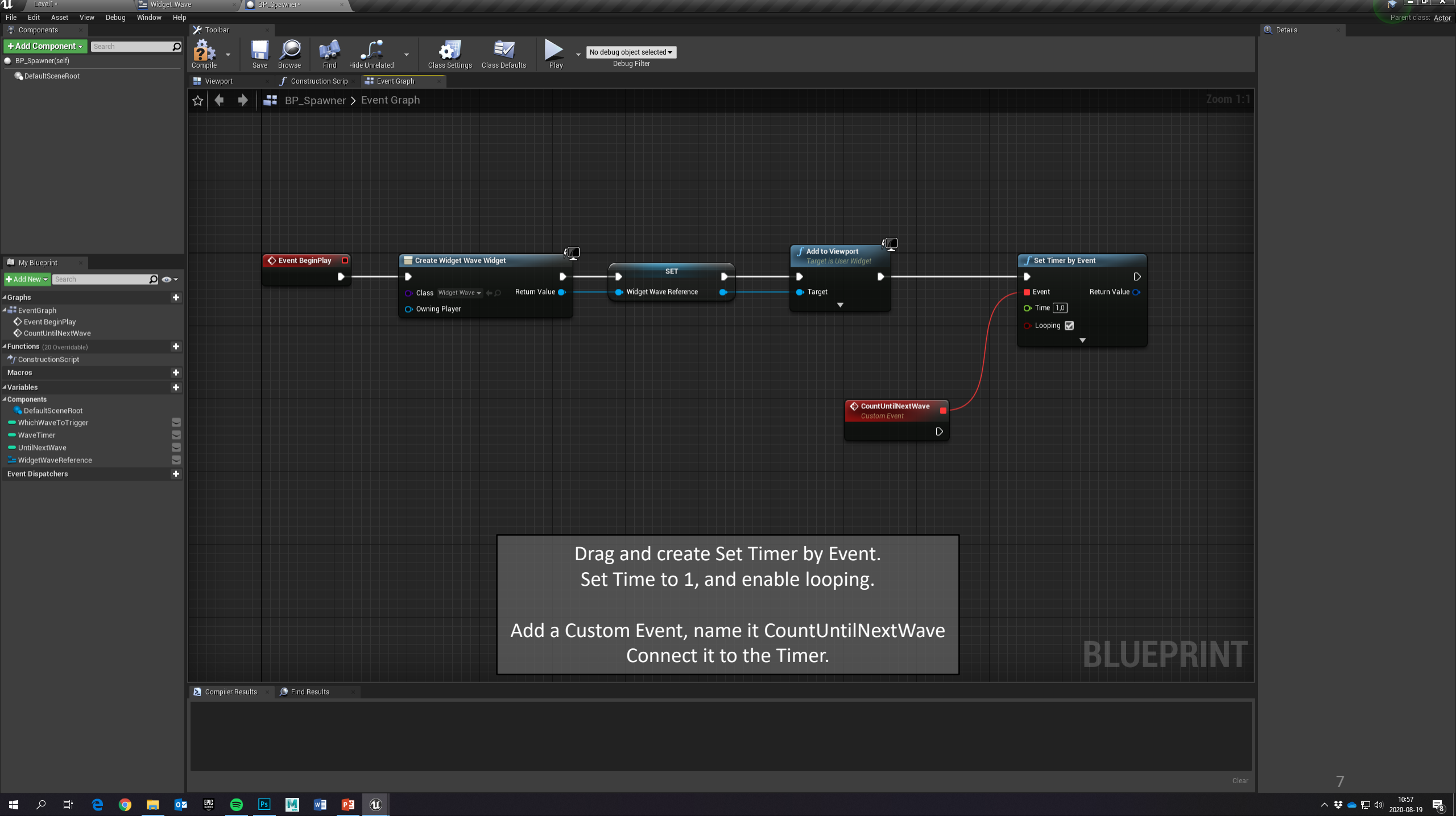

Level1*
BP_Core*
Widget_Core*
TowerDefenceTutorial
File
Edit
Window
Help
Place Actors
Search Classes
Recently Placed
Basic
Lights
Cinematic
Visual Effects
Geometry
Volumes
All Classes
Empty Actor
Empty Character
Empty Pawn
Point Light
Player Start
Cube
Sphere
Cylinder
Cone
Plane
Box Trigger
Sphere Trigger
Save Current
Source Control
Modes
Content
Marketplace
Settings
Megascans
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
World Outliner
Levels
Search...
Label
Type
Level1 (Editor)
World
Atmospheric Fog
AtmosphericFog
BP_BuildSite
Edit BP_BuildSite
BP_BuildSite2
Edit BP_BuildSite
BP_BuiltTool
Edit BP_BuiltTool
BP_CameraPawn
Edit BP_CameraPawn
BP_Core
Edit BP_Core
Floor
StaticMeshActor
Light Source
DirectionalLight
Sky Sphere
Edit BP_Sky_Sphere
SkyLight
SkyLight
10 actors
View Options
Details
World Settings
Select an object to view details.
Content Browser
Add New
Import
Save All
Content
Widgets
Search Paths
Content
Blueprints
Core
Enemies
Levels
Towers
Widgets
Filters
Search Widgets
Widget_Build Menu
Widget_Core
Widget_Money
Widget_Wave
4 items (1 selected)
View Options
Create a Widget, name it Widget_Wave.
Open it.
2
10:36
2020-08-19

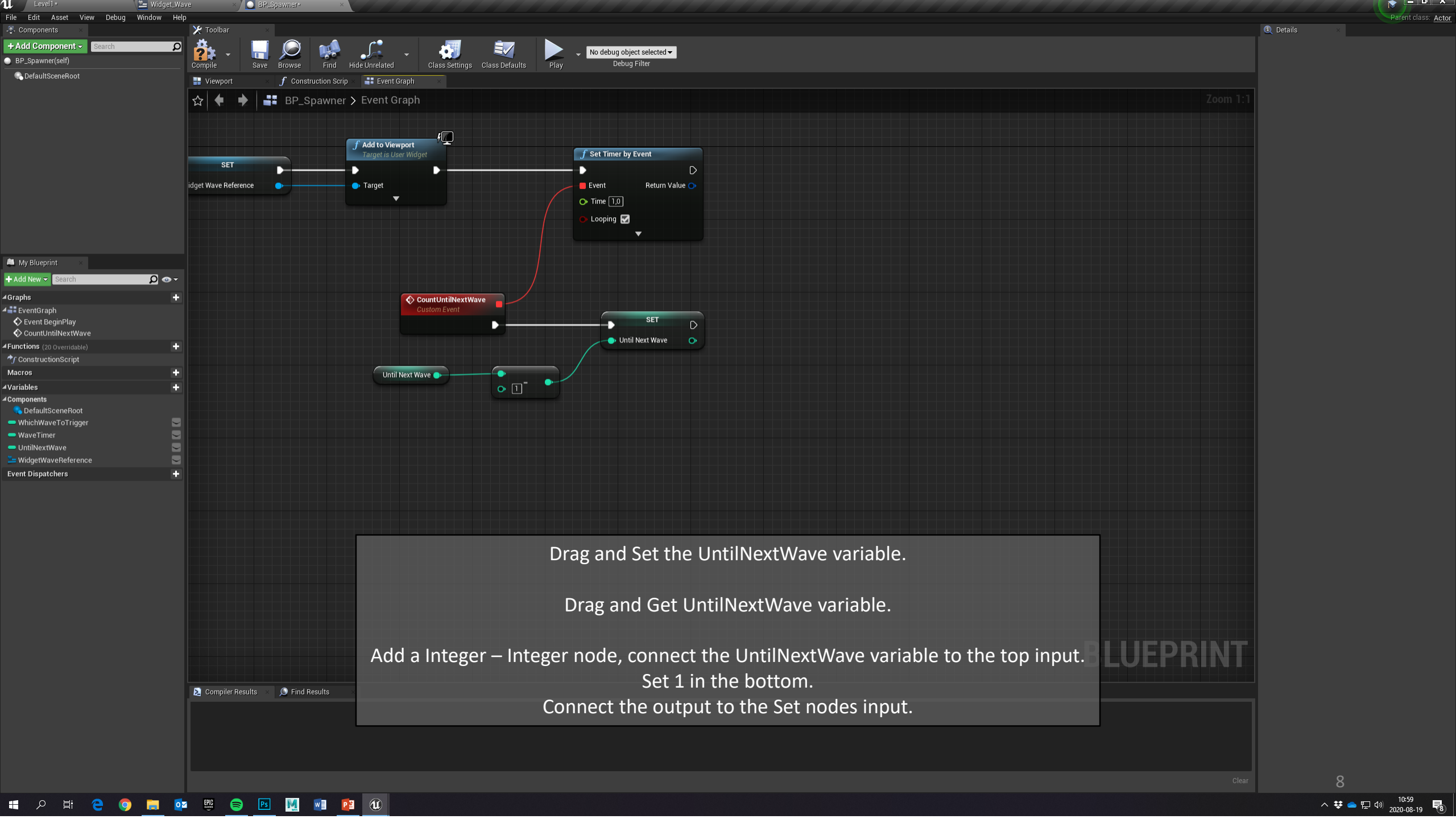

Level1 *
Widget_Wave
File Edit Asset View Debug Window Help
Parent class: User Widget
Compile
Save
Browse
Widget Reflector
Play
No debug object selected
Debug Filter
Designer
Graph
Palette
Search Palette
Common
Border
Button
Check Box
Image
Named Slot
Progress Bar
Rich Text Block
Slider
Text
Editor
Input
Lists
Misc
Optimization
Panel
Primitive
Special Effects
Synth
User Created
Hierarchy
Search Widgets
[Widget_Wave]
[Canvas Panel]
[WaveText] "Wave:"
[CountdownUntilNextWave] "0"
[WaveNumber] "0"
[TextCompleted] "Completed!"
Zoom -1
-375 x 355
None
Screen Size
Fill Screen
0
Wave:
0
Completed!
Device Content Scale 1,0
No Device Safe Zone Set
1280 x 720 (16:9)
DPI Scale 0,67
Details
CanvasPanel_0
Is Variable
Open CanvasPanel
Search Details
Behavior
Tool Tip Text
Is Enabled
Visibility
Not Hit-Testable (Self Only)
Render Opacity
1,0
Accessibility
Override Accessible Defaults
Can Children be Accessible
Accessible Behavior
Not Accessible
Render Transform
Transform
Pivot
X 0,5
Y 0,5
Performance
Is Volatile
Clipping
Clipping
Inherit
Navigation
Left
Right
Up
Down
Next
Previous
Escape
Localization
Flow Direction Preference
Inherit
Bind
Animations
Animation
Search Animations
Timeline
Compiler Results
20 fps
Track
Filters
Search Tracks
Drag and add 4 Text Objects:
Write a green zero at the top, name it CountdownUntilNextWave.
Write Wave beneath it, name it WaveText.
Write a 0 beneath WaveText, name it WaveNumber.
Write Completed! in the middle, name it Completed.
Set its opacity to 0.
Make sure all the Text objects are set to Is Variable.
10:43
2020-08-19

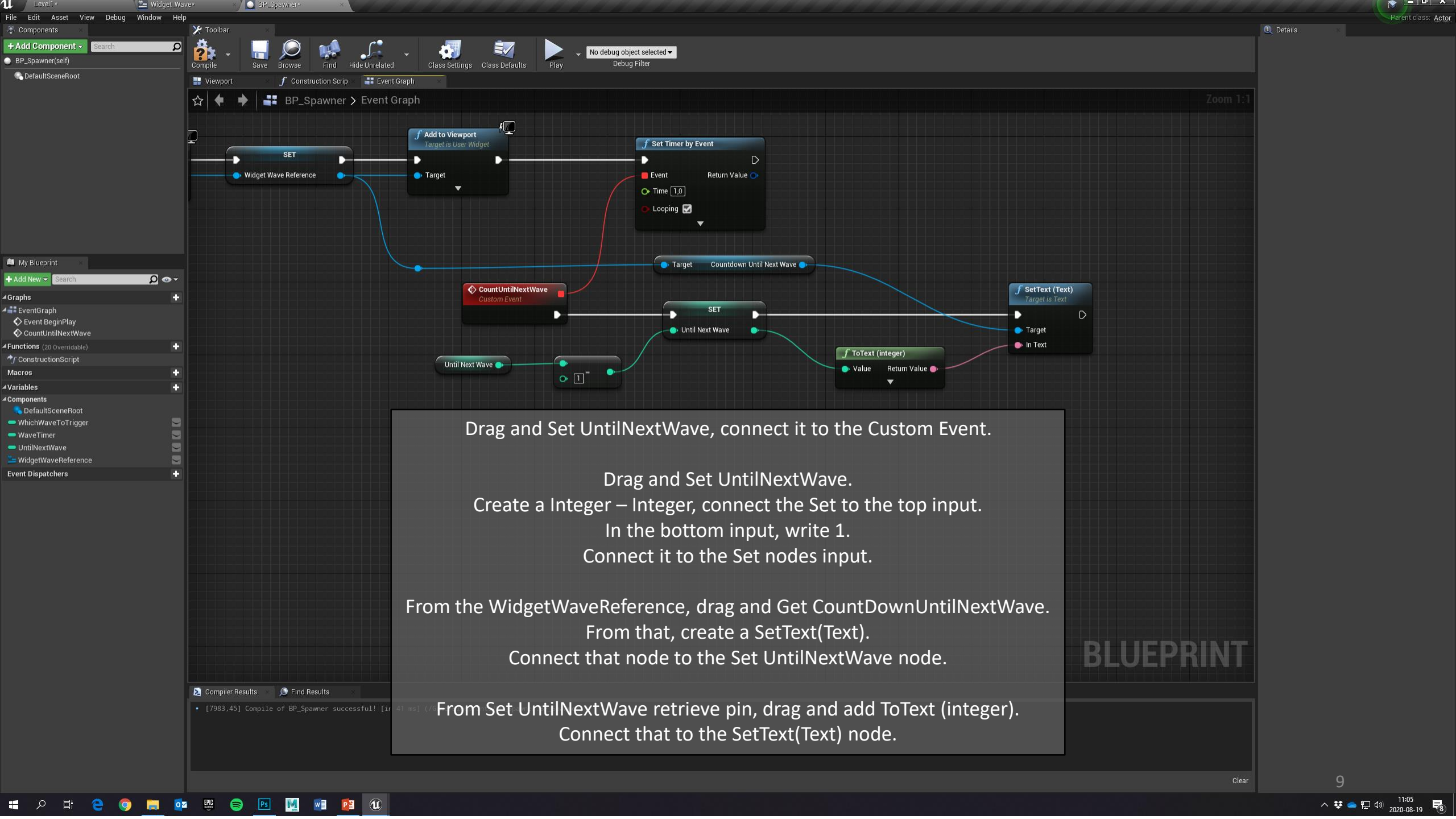

Level1 *
Widget_Wave
TowerDefenceTutorial
File
Edit
Window
Help
Place Actors
Search Classes
Recently Placed
Basic
Lights
Cinematic
Visual Effects
Geometry
Volumes
All Classes
Empty Actor
Empty Character
Empty Pawn
Point Light
Player Start
Cube
Sphere
Cylinder
Cone
Plane
Box Trigger
Sphere Trigger
Save Current
Source Control
Modes
Content
Marketplace
Settings
Megascans
Blueprints
Cinematics
Build
Play
Launch
Perspective
Lit
Show
World Outliner
Levels
Search...
Label
Type
Level1 (Editor)
World
Atmospheric Fog
AtmosphericFog
BP_BuildSite
Edit BP_BuildSite
BP_BuildSite2
Edit BP_BuildSite
BP_BuiltTool
Edit BP_BuiltTool
BP_CameraPawn
Edit BP_CameraPawn
BP_Core
Edit BP_Core
Floor
StaticMeshActor
Light Source
DirectionalLight
Sky Sphere
Edit BP_Sky_Sphere
SkyLight
SkyLight
10 actors
View Options
Details
World Settings
Select an object to view details.
Content Browser
Add New
Import
Save All
Content
Blueprints
Search Paths
Content
Blueprints
Core
Enemies
Levels
Towers
Widgets
Filters
Search Blueprints
BP_BuildSite
BP_BuiltTool
BP_Core
BP_Spawner
4 items (1 selected)
View Options
Create a new Blueprint > Actor, name it BP_Spawner.
Open it.
4
10:50
2020-08-19


Level1 *
Widget_Wave
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
Search
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Details
Parent class: Actor
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom 1:1
Right-Click to Create New Nodes.
This node is disabled and will not be called. Drag off pins to build functionality.
Event BeginPlay
This node is disabled and will not be called. Drag off pins to build functionality.
Event ActorBeginOverlap
Other Actor
This node is disabled and will not be called. Drag off pins to build functionality.
Event Tick
Delta Seconds
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event BeginPlay
Event ActorBeginOverlap
Event Tick
Functions (18 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
Event Dispatchers
Compiler Results
Find Results
Clear
Create 3 new Integer Variables.
Name them:
WhichWaveToTrigger
WaveTimer
UntilNextWave
BLUEPRINT
5
10:53
2020-08-19


Level1 *
Widget_Wave
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
Search
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Details
Parent class: Actor
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom 1:1
Event BeginPlay
Create Widget Wave Widget
Class Widget Wave
Owning Player
Return Value
SET
Widget Wave Reference
Add to Viewport
Target is User Widget
Target
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event BeginPlay
Functions (20 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
WidgetWaveReference
Event Dispatchers
From Event BeginPlay, drag and Create Widget.
Choose the Wave_Widget from the drop-down menu.
Righ-click the Return Value and Promote to Variable.
Name it WidgetWaveReference.
Add to Viewport, remember to connect the Target.
BLUEPRINT
Compiler Results
Find Results
Clear
6
10:55
2020-08-19


Level1 *
Widget_Wave
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
Search
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Details
Parent class: Actor
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom 1:1
Event BeginPlay
Create Widget Wave Widget
Class Widget Wave
Return Value
Owning Player
SET
Widget Wave Reference
Add to Viewport
Target is User Widget
Target
Set Timer by Event
Event
Return Value
Time 1.0
Looping
CountUntilNextWave
Custom Event
My Blueprint
Add New
Search
Graphs
EventGraph
Event BeginPlay
CountUntilNextWave
Functions (20 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
WidgetWaveReference
Event Dispatchers
Drag and create Set Timer by Event.
Set Time to 1, and enable looping.
Add a Custom Event, name it CountUntilNextWave
Connect it to the Timer.
BLUEPRINT
Compiler Results
Find Results
Clear
7
10:57
2020-08-19


Level1 *
Widget_Wave
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
Search
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom 1:1
SET
idget Wave Reference
Add to Viewport
Target is User Widget
Target
Set Timer by Event
Event
Return Value
Time 1,0
Looping
CountUntilNextWave
Custom Event
SET
Until Next Wave
Until Next Wave
1
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event BeginPlay
CountUntilNextWave
Functions (20 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
WidgetWaveReference
Event Dispatchers
Details
Parent class: Actor
Compiler Results
Find Results
Clear
Drag and Set the UntilNextWave variable.
Drag and Get UntilNextWave variable.
Add a Integer – Integer node, connect the UntilNextWave variable to the top input.
Set 1 in the bottom.
Connect the output to the Set nodes input.
BLUEPRINT
8
10:59
2020-08-19

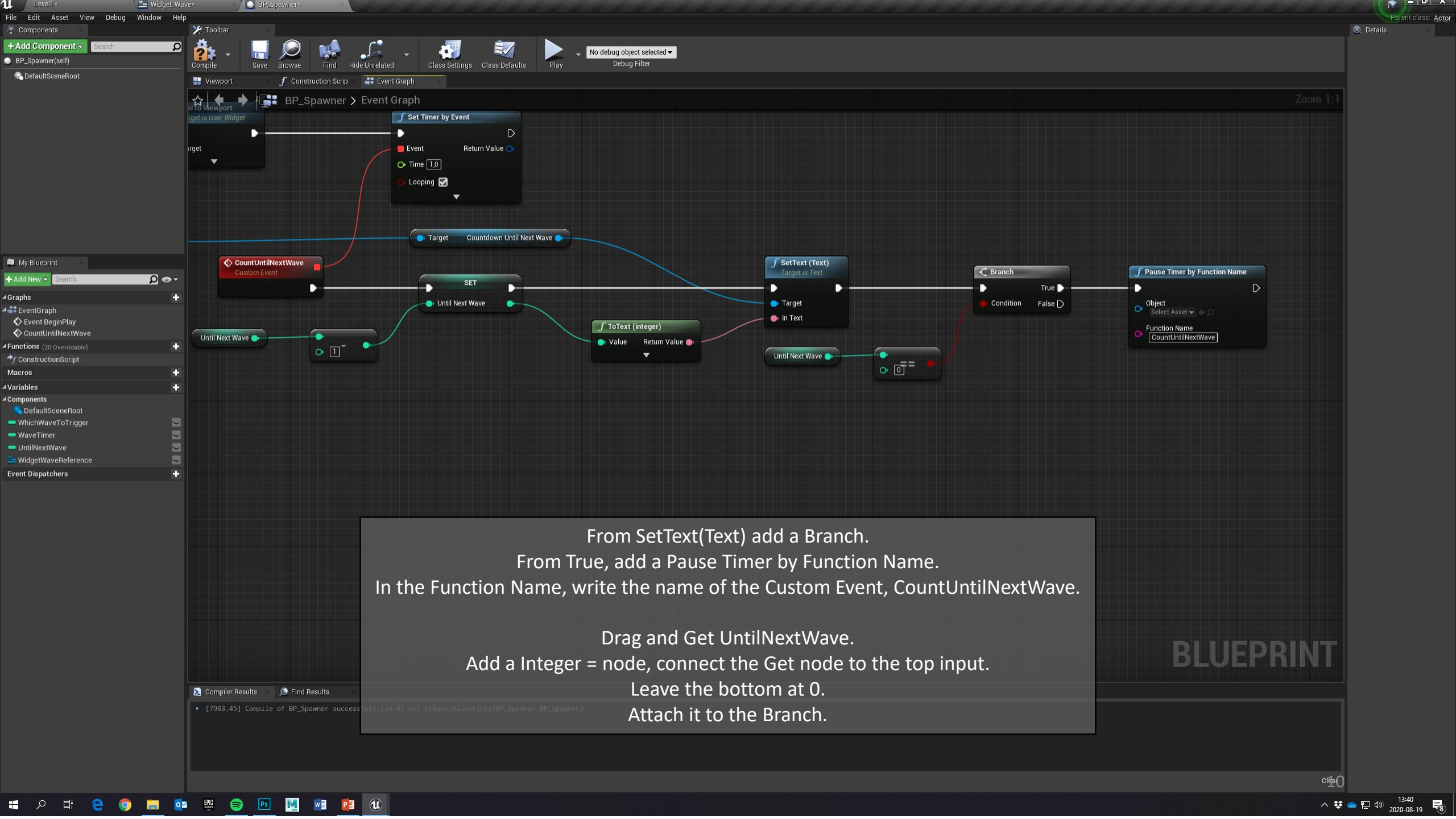


Drag and Set UntilNextWave, connect it to the Custom Event.

Drag and Set UntilNextWave.
Create a Integer – Integer, connect the Set to the top input.
In the bottom input, write 1.
Connect it to the Set nodes input.

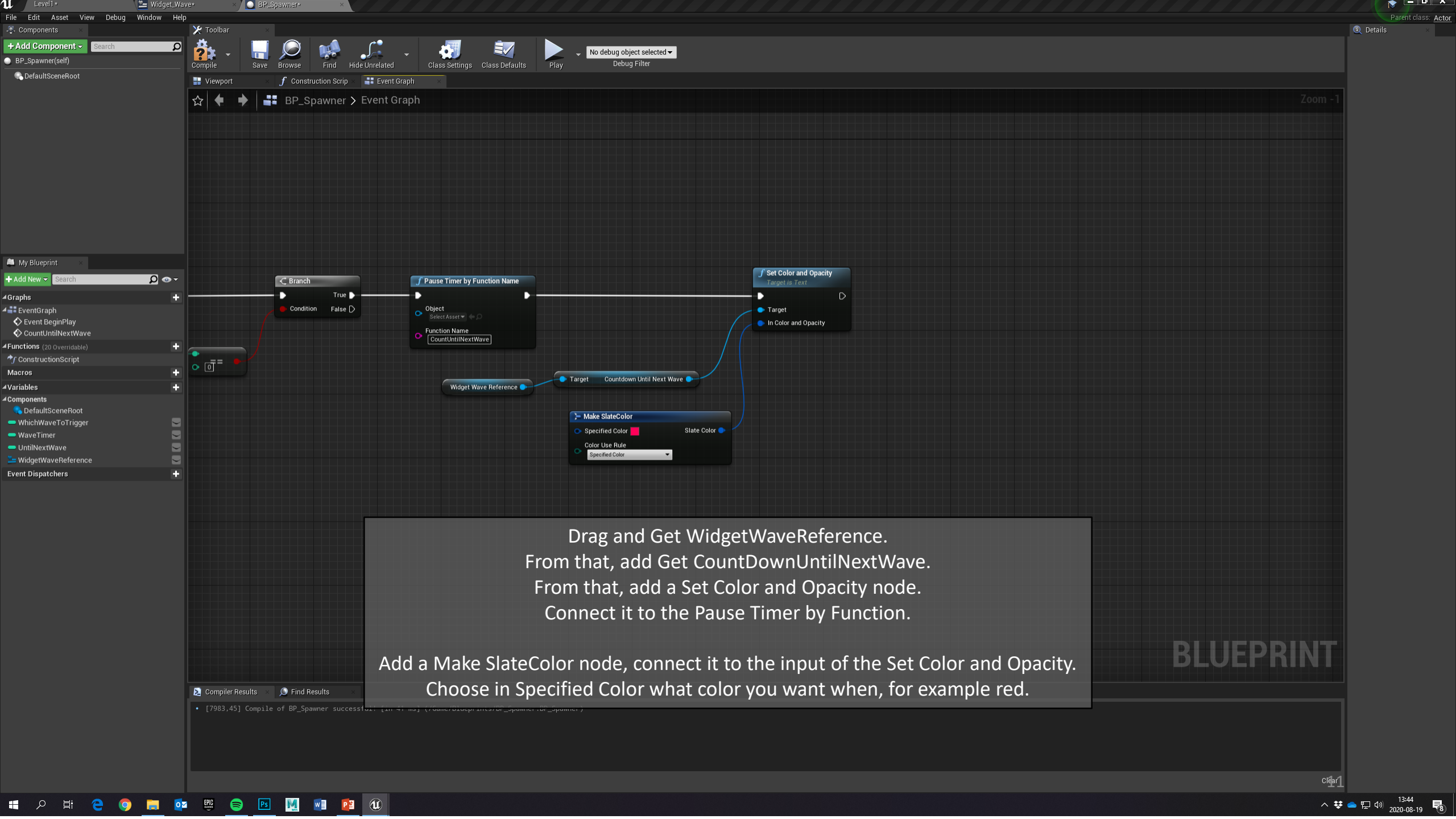
From the WidgetWaveReference, drag and Get CountDownUntilNextWave.
From that, create a SetText(Text).
Connect that node to the Set UntilNextWave node.

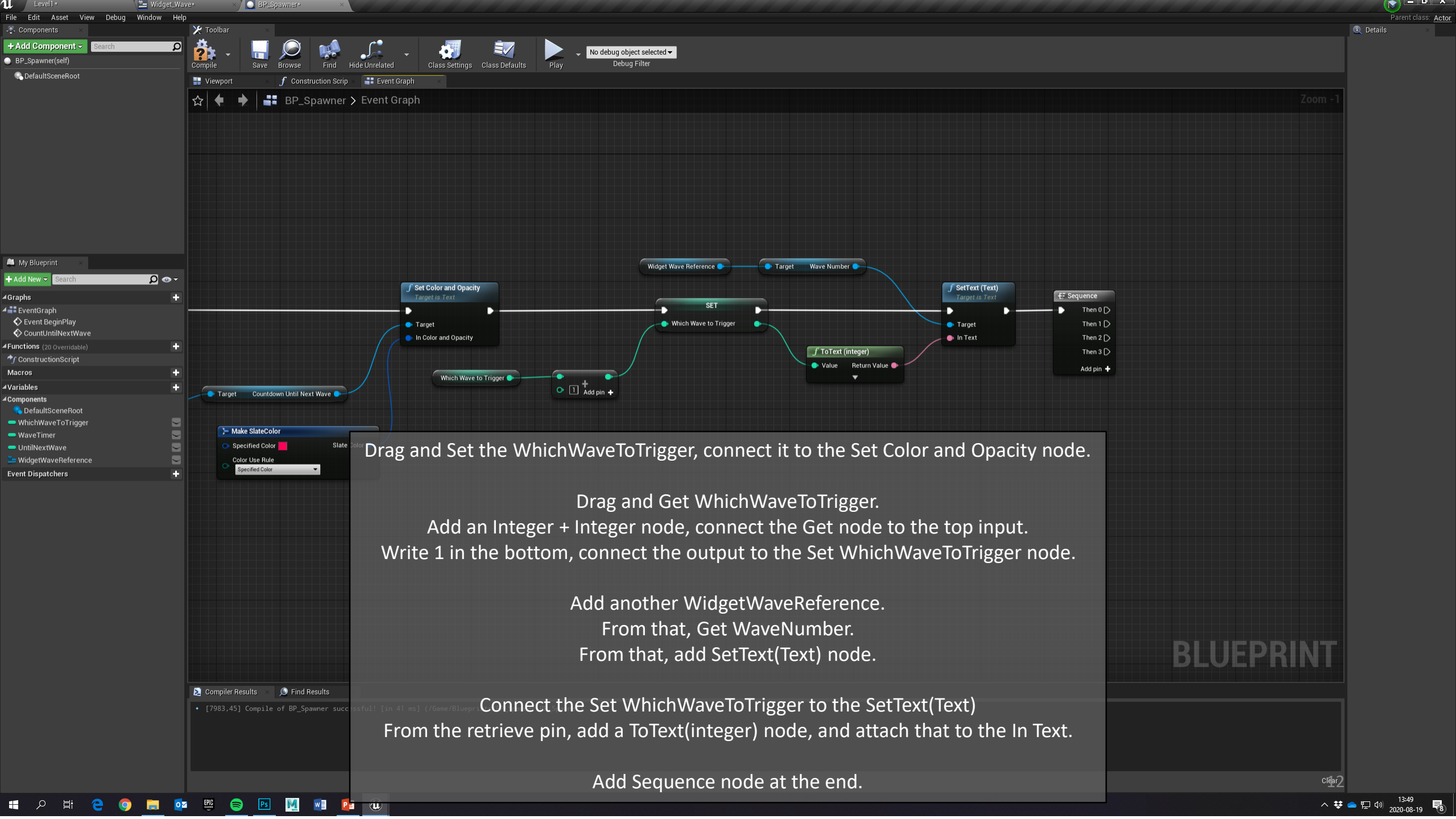
From Set UntilNextWave retrieve pin, drag and add ToText (integer).
Connect that to the SetText(Text) node.

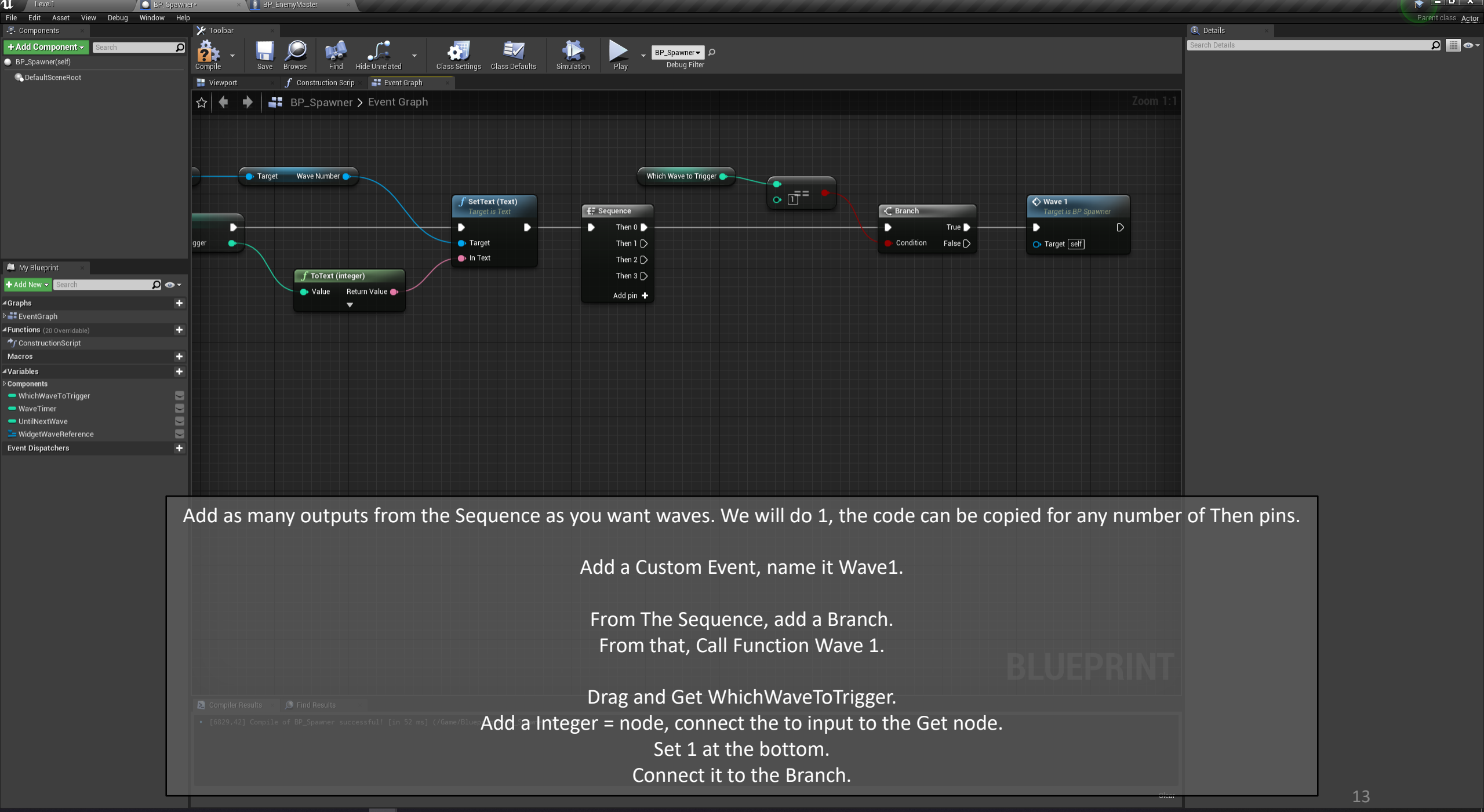


From SetText(Text) add a Branch.
From True, add a Pause Timer by Function Name.
In the Function Name, write the name of the Custom Event, CountUntilNextWave.

Drag and Get UntilNextWave.
Add a Integer = node, connect the Get node to the top input.
Leave the bottom at 0.
Attach it to the Branch.


Level1 *
Widget_Wave*
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
Search
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Details
Parent class: Actor
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom -1
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event BeginPlay
CountUntilNextWave
Functions (20 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
WidgetWaveReference
Event Dispatchers
Branch
True
Condition
False
Pause Timer by Function Name
Object
Select Asset
Function Name
CountUntilNextWave
Set Color and Opacity
Target is Text
Target
In Color and Opacity
Widget Wave Reference
Target
Countdown Until Next Wave
Make SlateColor
Specified Color
Slate Color
Color Use Rule
Specified Color
Drag and Get WidgetWaveReference.
From that, add Get CountDownUntilNextWave.
From that, add a Set Color and Opacity node.
Connect it to the Pause Timer by Function.
Add a Make SlateColor node, connect it to the input of the Set Color and Opacity.
Choose in Specified Color what color you want when, for example red.
BLUEPRINT
Compiler Results
Find Results
Clear
13:44
2020-08-19


Drag and Set the WhichWaveToTrigger, connect it to the Set Color and Opacity node.
Drag and Get WhichWaveToTrigger.
Add an Integer + Integer node, connect the Get node to the top input.
Write 1 in the bottom, connect the output to the Set WhichWaveToTrigger node.
Add another WidgetWaveReference.
From that, Get WaveNumber.
From that, add SetText(Text) node.
Connect the Set WhichWaveToTrigger to the SetText(Text)
From the retrieve pin, add a ToText(integer) node, and attach that to the In Text.
Add Sequence node at the end.
BLUEPRINT

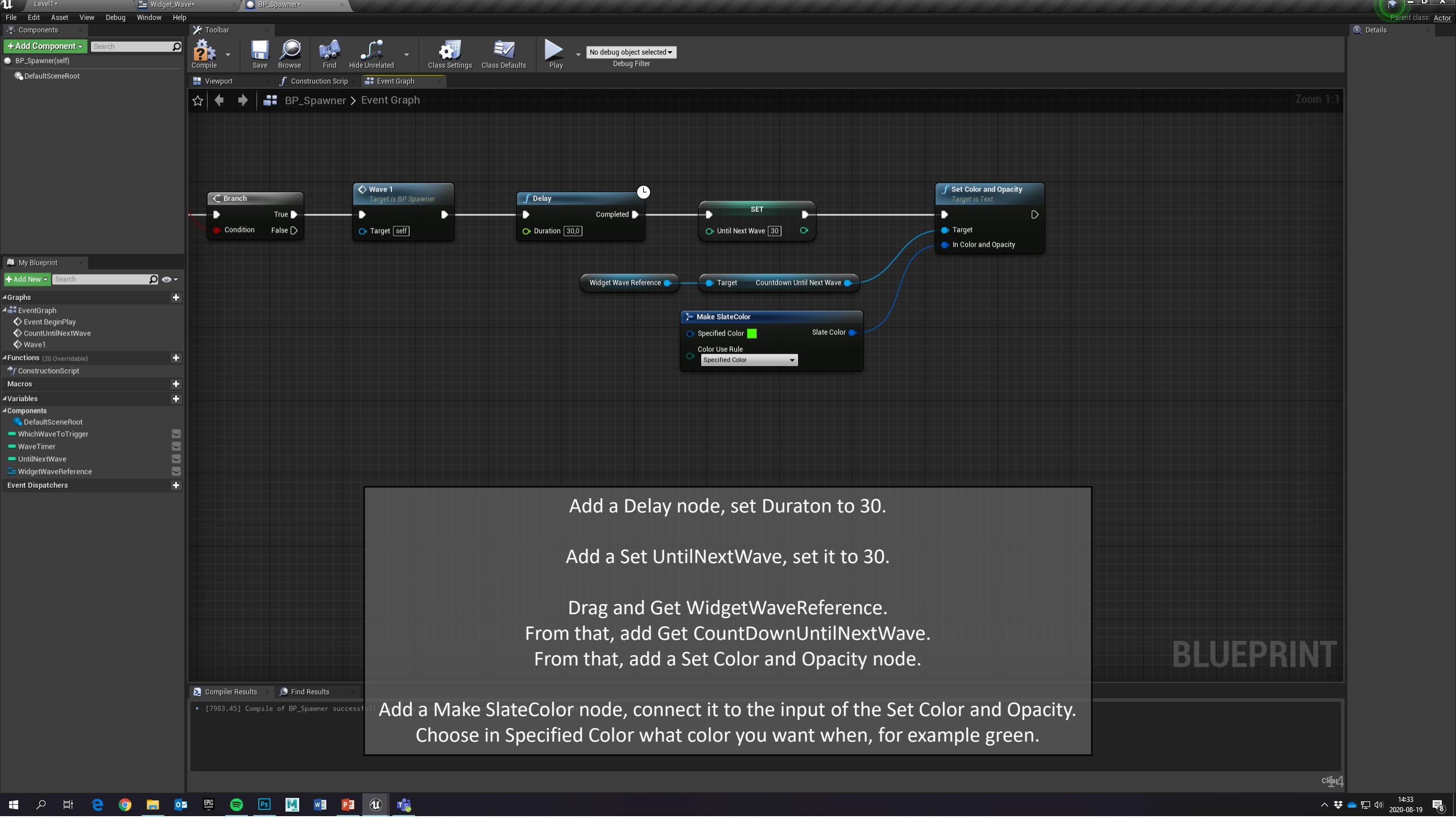


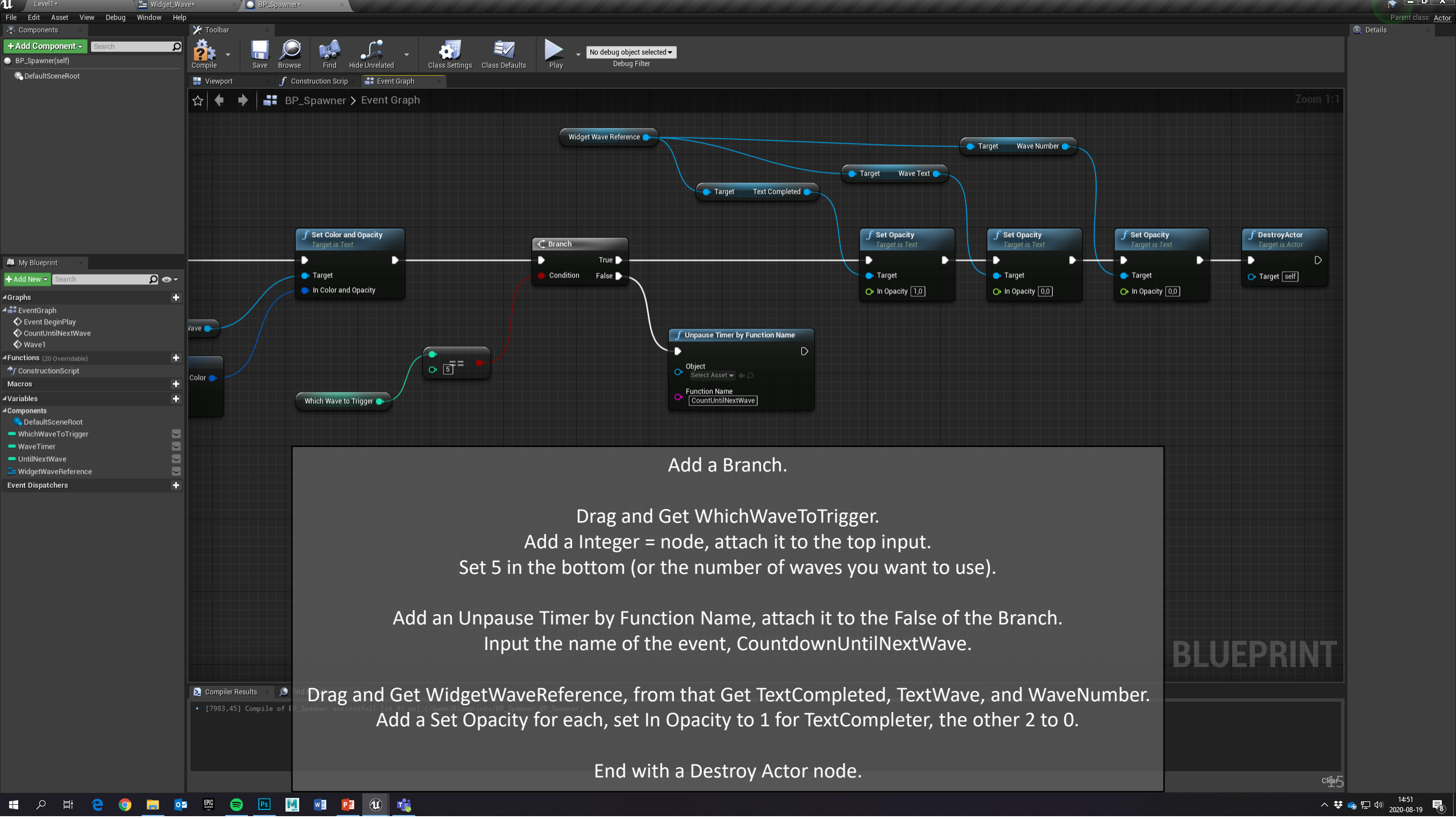
Add as many outputs from the Sequence as you want waves. We will do 1, the code can be copied for any number of Then pins.

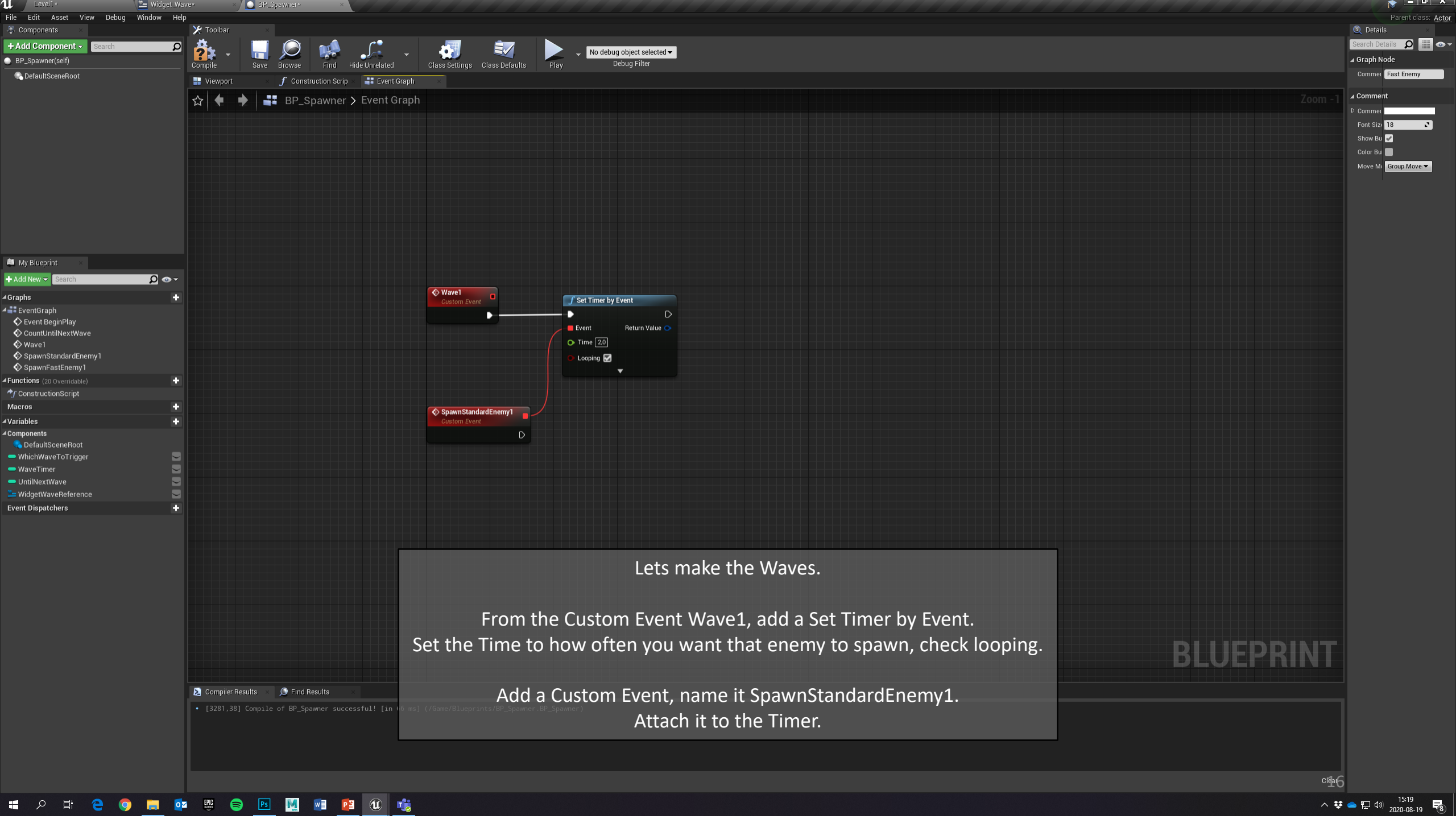
Add a Custom Event, name it Wave1.

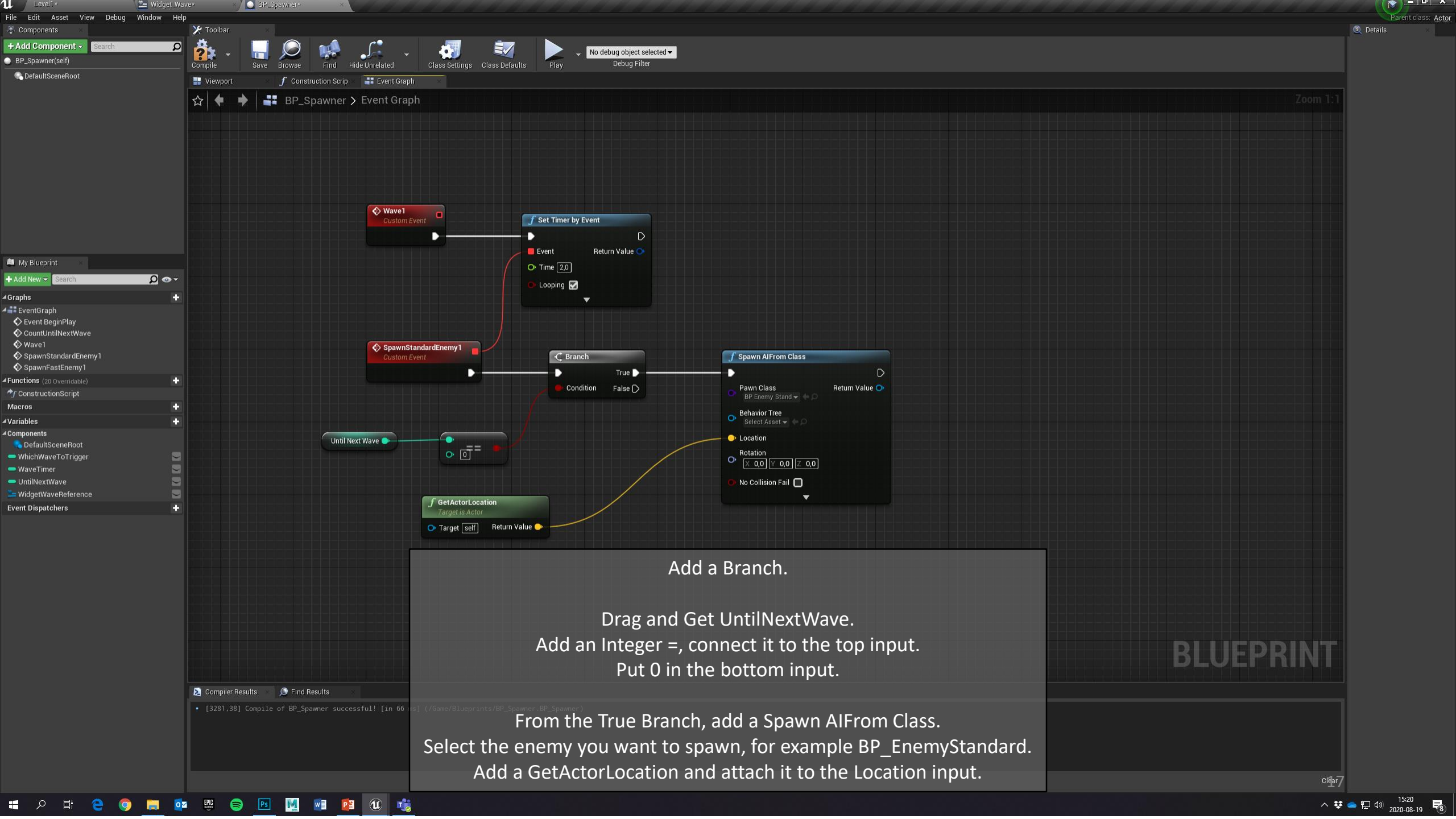
From The Sequence, add a Branch.
From that, Call Function Wave 1.

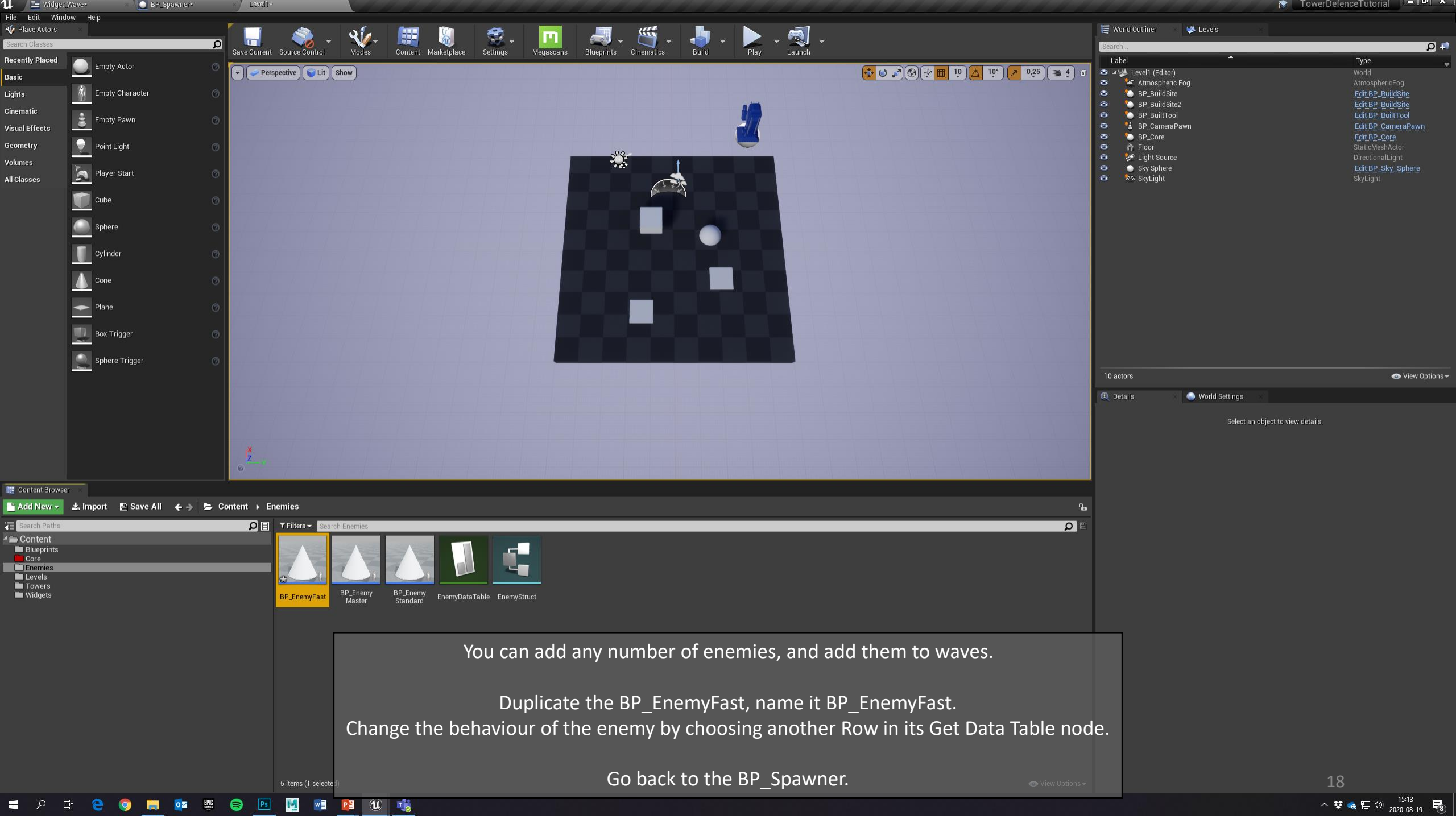
Drag and Get WhichWaveToTrigger.
Add a Integer = node, connect the to input to the Get node.
Set 1 at the bottom.
Connect it to the Branch.


Level1 *
Widget_Wave*
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
Search
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Details
Parent class: Actor
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom 1:1
Branch
Condition
True
False
Wave 1
Target is BP Spawner
Target self
Delay
Duration 30,0
Completed
SET
Until Next Wave 30
Set Color and Opacity
Target is Text
Target
In Color and Opacity
Widget Wave Reference
Target
Countdown Until Next Wave
Make SlateColor
Specified Color
Slate Color
Color Use Rule
Specified Color
My Blueprint
+ Add New
Search
Graphs
EventGraph
Event BeginPlay
CountUntilNextWave
Wave1
Functions (20 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
WidgetWaveReference
Event Dispatchers
Add a Delay node, set Duraton to 30.
Add a Set UntilNextWave, set it to 30.
Drag and Get WidgetWaveReference.
From that, add Get CountDownUntilNextWave.
From that, add a Set Color and Opacity node.
Add a Make SlateColor node, connect it to the input of the Set Color and Opacity.
Choose in Specified Color what color you want when, for example green.
BLUEPRINT
Compiler Results
Find Results
[7983,45] Compile of BP_Spawner successful!
Clear
14:33
2020-08-19


Add a Branch.
Drag and Get WhichWaveToTrigger.
Add a Integer = node, attach it to the top input.
Set 5 in the bottom (or the number of waves you want to use).
Add an Unpause Timer by Function Name, attach it to the False of the Branch.
Input the name of the event, CountdownUntilNextWave.
Drag and Get WidgetWaveReference, from that Get TextCompleted, TextWave, and WaveNumber.
Add a Set Opacity for each, set In Opacity to 1 for TextCompleter, the other 2 to 0.
End with a Destroy Actor node.
Widget Wave Reference
Target
Wave Number
Target
Wave Text
Target
Text Completed
Set Color and Opacity
Target is Text
Target
In Color and Opacity
Branch
Condition
True
False
Set Opacity
Target is Text
Target
In Opacity 1,0
Set Opacity
Target is Text
Target
In Opacity 0,0
Set Opacity
Target is Text
Target
In Opacity 0,0
DestroyActor
Target is Actor
Target self
Unpause Timer by Function Name
Object
Select Asset
Function Name
CountUntilNextWave
5
Which Wave to Trigger
BP_Spawner > Event Graph
Zoom 1:1
BLUEPRINT


Level1 *
Widget_Wave*
BP_Spawner*
File Edit Asset View Debug Window Help
Components
+ Add Component
BP_Spawner(self)
DefaultSceneRoot
Toolbar
Compile
Save
Browse
Find
Hide Unrelated
Class Settings
Class Defaults
Play
No debug object selected
Debug Filter
Viewport
Construction Scrip
Event Graph
BP_Spawner > Event Graph
Zoom -1
Wave1
Custom Event
Set Timer by Event
Event
Return Value
Time 2.0
Looping
SpawnStandardEnemy1
Custom Event
My Blueprint
+ Add New
Graphs
EventGraph
Event BeginPlay
CountUntilNextWave
Wave1
SpawnStandardEnemy1
SpawnFastEnemy1
Functions (20 Overridable)
ConstructionScript
Macros
Variables
Components
DefaultSceneRoot
WhichWaveToTrigger
WaveTimer
UntilNextWave
WidgetWaveReference
Event Dispatchers
Details
Graph Node
Fast Enemy
Comment
Font Size 18
Show Bu
Color Bu
Move Mo
Group Move
Lets make the Waves.
From the Custom Event Wave1, add a Set Timer by Event.
Set the Time to how often you want that enemy to spawn, check looping.
Add a Custom Event, name it SpawnStandardEnemy1.
Attach it to the Timer.
BLUEPRINT
Compiler Results
Find Results
[3281,38] Compile of BP_Spawner successful! [in 16 ms] (/Game/Blueprints/BP_Spawner.BP_Spawner)
Clear
15:19
2020-08-19

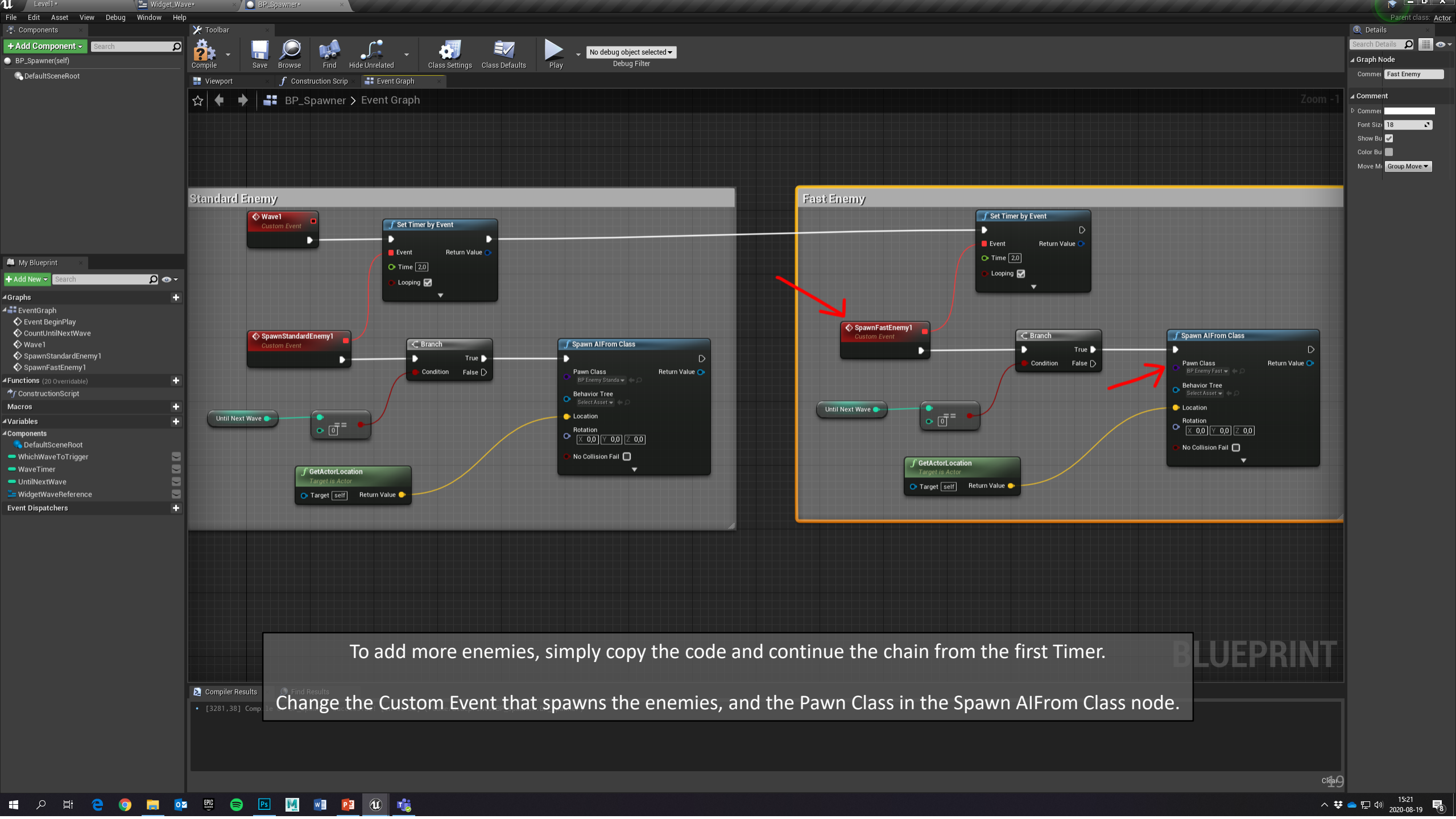

Add a Branch.
Drag and Get UntilNextWave.
Add an Integer =, connect it to the top input.
Put 0 in the bottom input.
From the True Branch, add a Spawn AIFrom Class.
Select the enemy you want to spawn, for example BP_EnemyStandard.
Add a GetActorLocation and attach it to the Location input.
Wave1
Custom Event
Set Timer by Event
Event
Return Value
Time 2,0
Looping
SpawnStandardEnemy1
Custom Event
Branch
True
Condition
False
Spawn AIFrom Class
Pawn Class
Return Value
Behavior Tree
Select Asset
Location
Rotation
No Collision Fail
Until Next Wave
GetActorLocation
Target is Actor
Target self
Return Value
BLUEPRINT

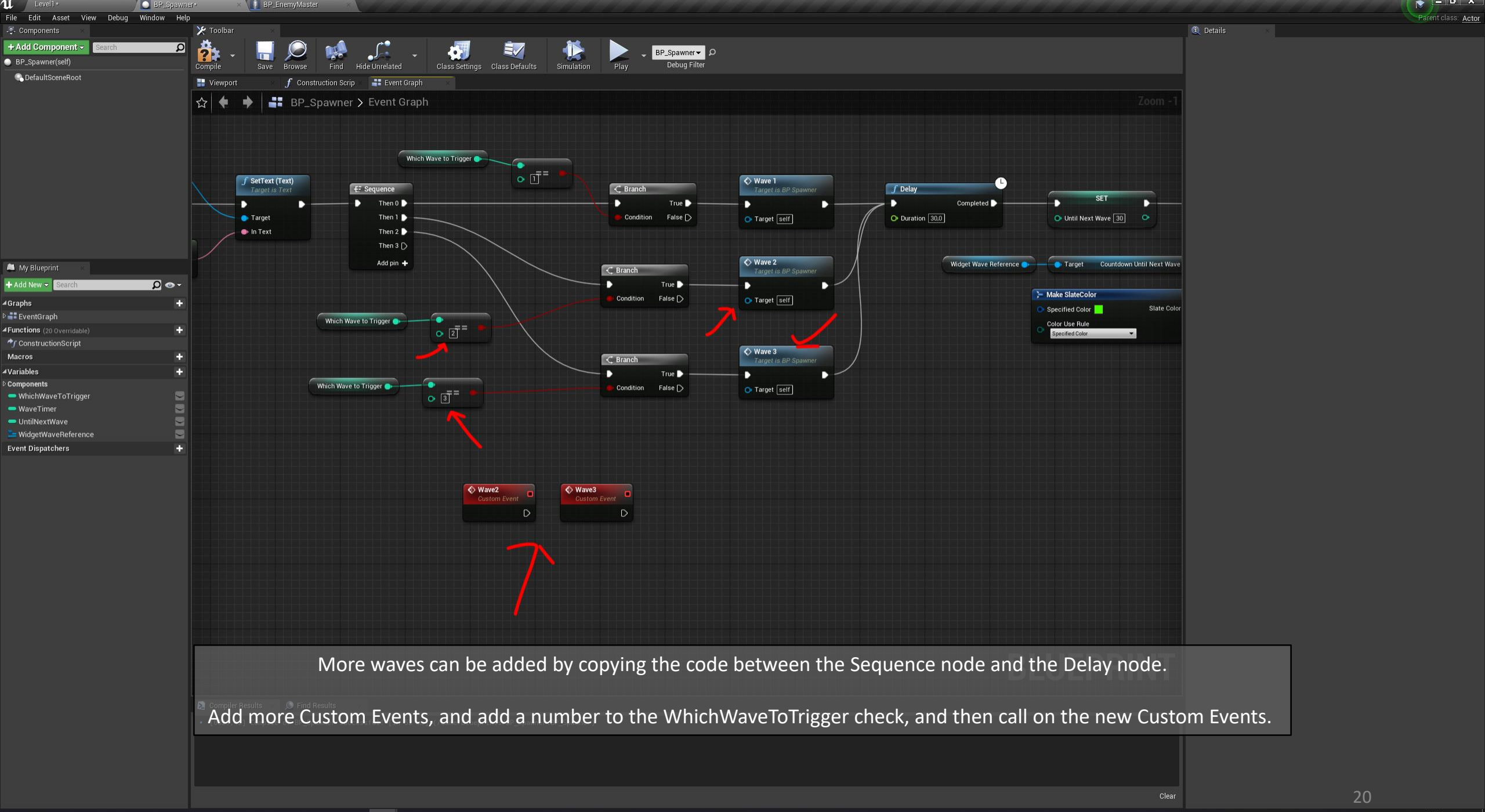


You can add any number of enemies, and add them to waves.

Duplicate the BP_EnemyFast, name it BP_EnemyFast.
Change the behaviour of the enemy by choosing another Row in its Get Data Table node.

Go back to the BP_Spawner.


Standard Enemy
Fast Enemy
Wave1
Custom Event
Set Timer by Event
Event
Return Value
Time 2.0
Looping
SpawnStandardEnemy1
Branch
True
False
Condition
Spawn AIFrom Class
Pawn Class
Behavior Tree
Location
Rotation
No Collision Fail
Until Next Wave
GetActorLocation
Target is Actor
Target self
SpawnFastEnemy1
To add more enemies, simply copy the code and continue the chain from the first Timer.
Change the Custom Event that spawns the enemies, and the Pawn Class in the Spawn AIFrom Class node.



More waves can be added by copying the code between the Sequence node and the Delay node.

Add more Custom Events, and add a number to the WhichWaveToTrigger check, and then call on the new Custom Events.