PVP TANKS GAME

Game AI Project

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Building a game in 8 phases.

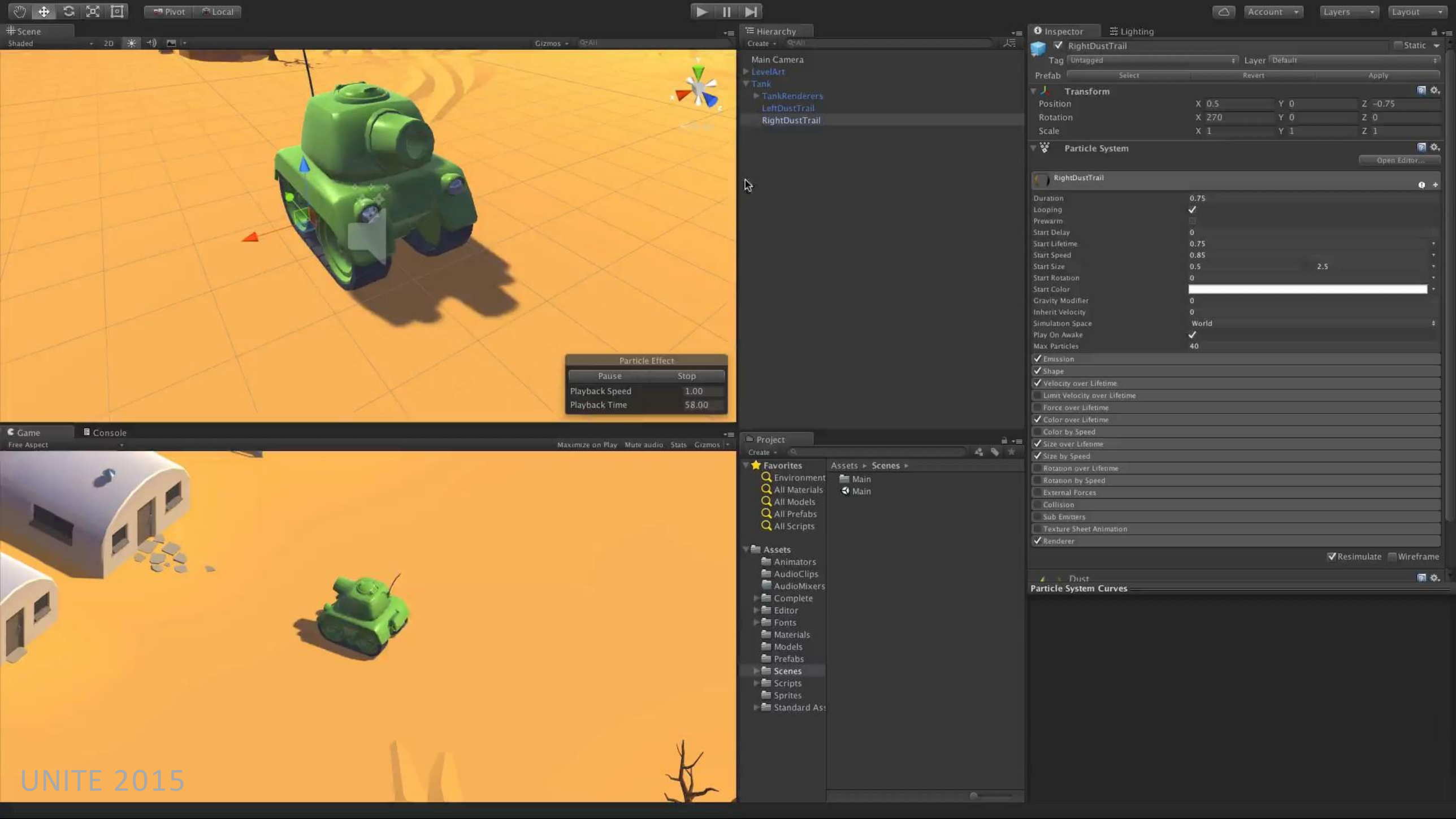
1. - **PROJECT & SCENE SETUP**
2. - **TANK CREATION & CONTROLS**
3. - **CAMERA**
4. - **HEALTH**
5. - **SHELLS**
6. - **SHOOTING**
7. - **GAME MANAGERS**
8. - **AUDIO**

SCENE SETUP

1. **Delete** the **Directional Light** from the scene
2. **Drag** the **Level Art** prefab from the **Project** panel **Prefabs** folder into the **Hierarchy** panel
3. From the **Window** menu, **open** the **Lighting Panel** and dock it with the **Inspector**

PHASE TWO

TANK CREATION


Pivot
Local
Account
Layers
Layout
Scene
Shaded
2D
Gizmos
Hierarchy
Create
Main Camera
LevelArt
Tank
TankRenderers
LeftDustTrail
RightDustTrail
Inspector
Lighting
RightDustTrail
Static
Tag
Untagged
Layer
Default
Prefab
Select
Revert
Apply
Transform
Position
X 0.5
Y 0
Z -0.75
Rotation
X 270
Y 0
Z 0
Scale
X 1
Y 1
Z 1
Particle System
Open Editor...
RightDustTrail
Duration 0.75
Looping
Prewarm
Start Delay 0
Start Lifetime 0.75
Start Speed 0.85
Start Size 0.5 2.5
Start Rotation 0
Start Color
Gravity Modifier 0
Inherit Velocity 0
Simulation Space World
Play On Awake
Max Particles 40
Emission
Shape
Velocity over Lifetime
Limit Velocity over Lifetime
Force over Lifetime
Color over Lifetime
Color by Speed
Size over Lifetime
Size by Speed
Rotation over Lifetime
Rotation by Speed
External Forces
Collision
Sub Emitters
Texture Sheet Animation
Renderer
Resimulate
Wireframe
Dust
Particle System Curves
Particle Effect
Pause
Stop
Playback Speed 1.00
Playback Time 58.00
Game
Console
Free Aspect
Maximize on Play
Mute audio
Stats
Gizmos
Project
Create
Favorites
Environment
All Materials
All Models
All Prefabs
All Scripts
Assets
Animators
AudioClips
AudioMixers
Complete
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Standard Ass
Assets ▸ Scenes ▸
Main
Main
UNITE 2015

TANK CREATION

1. In the **Models** folder of the **Project**, find the model called **Tank** and **drag** it into the **Hierarchy** panel
2. At the top of the **Inspector** panel, set the **Layer** of the **Tank** GameObject to **Players**
3. For the **Change Layer** dialog that appears, select **No, this object only**

MOVING

1. From the **Prefabs** folder drag the **DustTrail** prefab onto the **Tank** GameObject in the **Hierarchy** to make it a child GameObject
2. Duplicate the **DustTrail** so that there are two, use Command-D on Mac, Ctrl-D on PC

PHASE THREE

CAMERA

Scene
Hierarchy
Inspector
Persp
SpawnPoint1
SpawnPoint2
Camera Preview
Game
Console
Project
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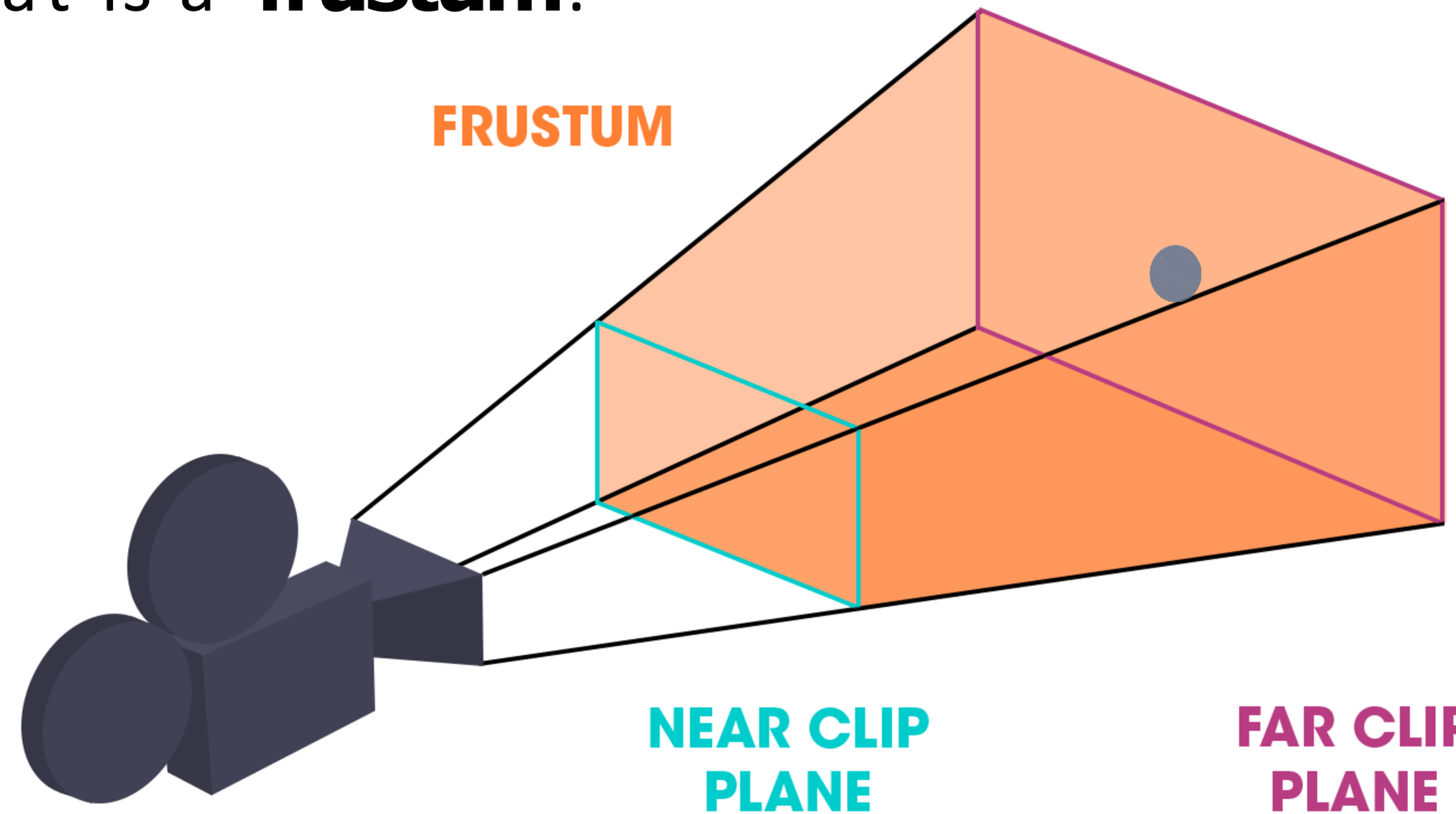
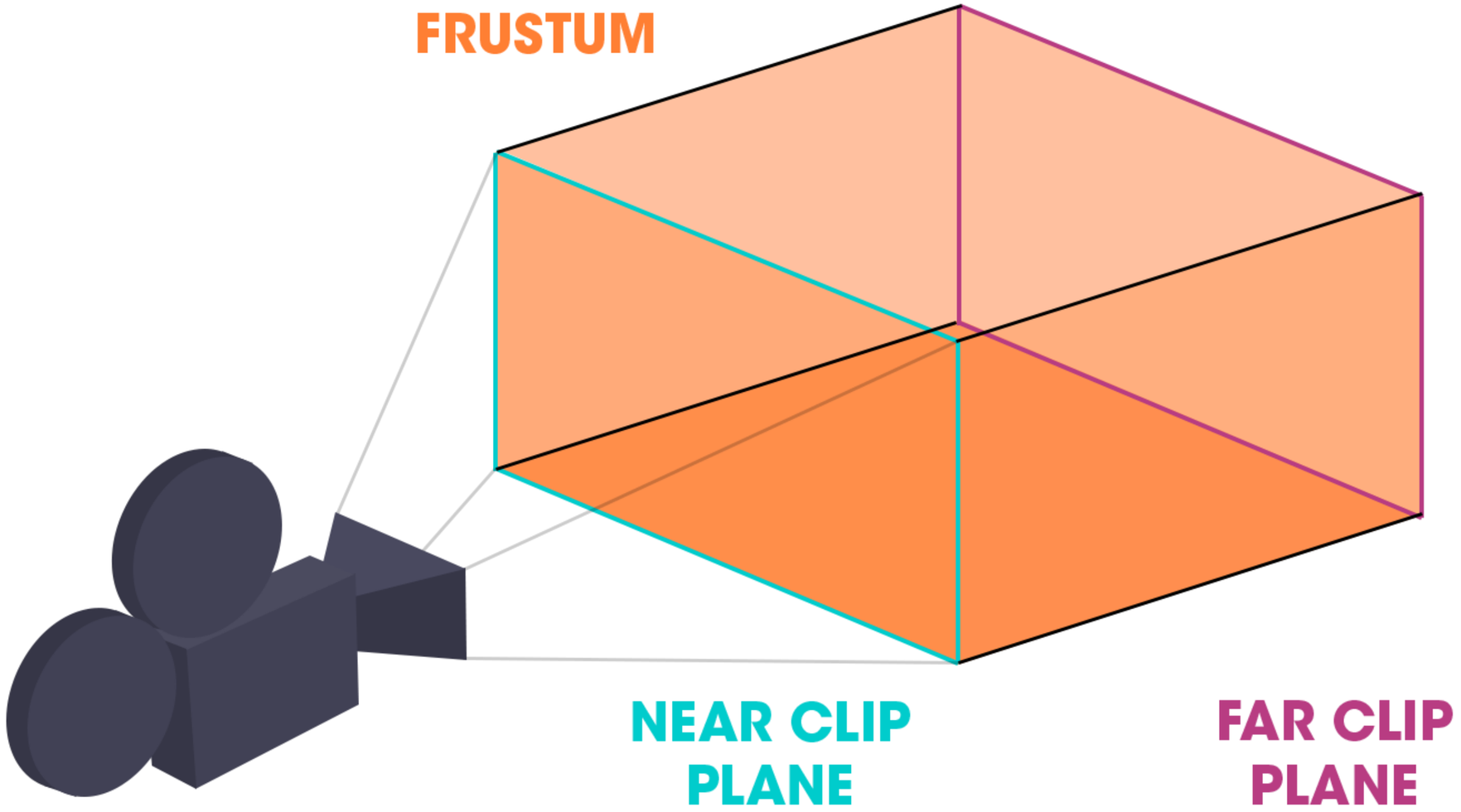
CAMERA

- What is a **frustum**?



CAMERA

- What is an **orthographic camera**?



What should our camera do?

- Follow the tanks
- Re-size (Zoom) to fit the tanks on screen

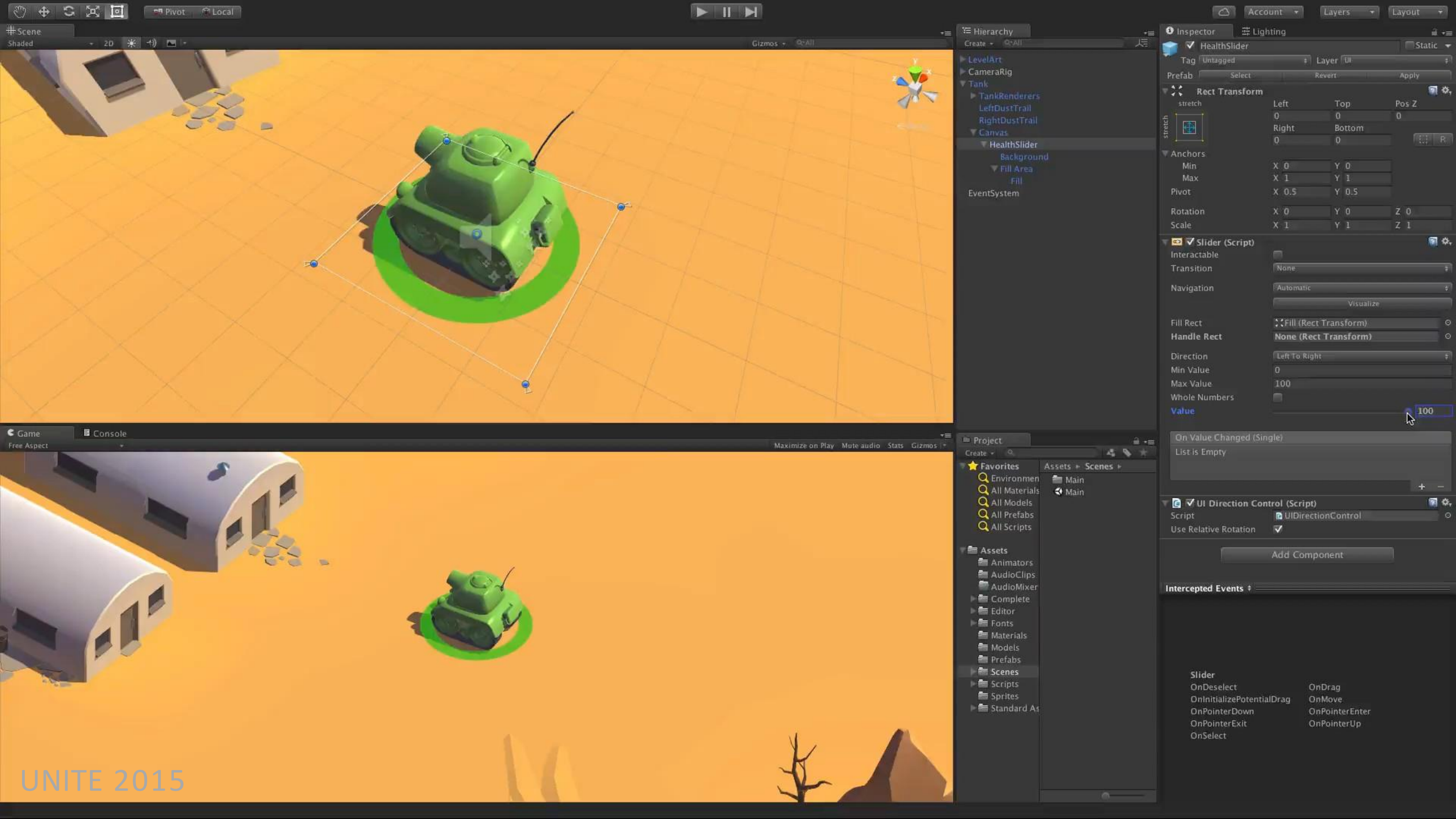
CAMERA

FOLLOWING THE TANKS

I. Find the Average of the Tanks' positions
II. Set the **CameraRig** to that position each frame

PHASE FOUR

HEALTH


Pivot
Local
Account
Layers
Layout
Scene
Shaded
2D
Gizmos
Hierarchy
Create
LevelArt
CameraRig
Tank
TankRenderers
LeftDustTrail
RightDustTrail
Canvas
HealthSlider
Background
Fill Area
Fill
EventSystem
Inspector
Lighting
HealthSlider
Static
Tag
Untagged
Layer
UI
Prefab
Select
Revert
Apply
Rect Transform
stretch
Left
Top
Pos Z
Right
Bottom
Anchors
Min
Max
Pivot
Rotation
Scale
Slider (Script)
Interactable
Transition
None
Navigation
Automatic
Visualize
Fill Rect
Fill (Rect Transform)
Handle Rect
None (Rect Transform)
Direction
Left To Right
Min Value
Max Value
Whole Numbers
Value
100
On Value Changed (Single)
List is Empty
UI Direction Control (Script)
Script
UIDirectionControl
Use Relative Rotation
Add Component
Intercepted Events
Slider
OnDeselect
OnInitializePotentialDrag
OnPointerDown
OnPointerExit
OnSelect
OnDrag
OnMove
OnPointerEnter
OnPointerUp
Game
Console
Free Aspect
Maximize on Play
Mute audio
Stats
Gizmos
Project
Create
Favorites
Environmen
All Materials
All Models
All Prefabs
All Scripts
Assets
Animators
AudioClips
AudioMixer
Complete
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Standard As
Assets ▸ Scenes ▸
Main
Main
UNITE 2015

1. Select the **Slider** GameObject
2. On the **Slider** component uncheck **Interactable**
3. Change the **Transition** to **None**
4. Change the **Max Value** and **Value** to **100**

1. On the **TankExplosion** GameObject, click **Apply** to update the prefab
2. **Delete** the **TankExplosion** prefab from the **Hierarchy**
3. Find the **TankHealth** script in the **Scripts/Tank** folder. **Drag** it onto the **Tank** GameObject
4. **Double-click** on the **TankHealth** script to **open** it for editing

END OF PHASE

Pivot
Local
Account
Layers
Layout
Scene
Shaded
2D
Gizmos
Persp
Hierarchy
Create
LevelArt
CameraRig
Tank
EventSystem
Shell
Inspector
Lighting
Tank
Static
Tag
Untagged
Layer
Players
Prefab
Select
Revert
Apply
Transform
Position
Rotation
Scale
Rigidbody
Box Collider
Audio Source
Audio Source
Tank Movement (Script)
Tank Health (Script)
Add Component
Game
Console
Free Aspect
Maximize on Play
Mute audio
Stats
Gizmos
Project
Create
Favorites
Environmen
All Materials
All Models
All Prefabs
All Scripts
Assets
Animators
AudioClips
AudioMixer
Complete
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Standard As
Assets ▸ Prefabs
DustTrail
LevelArt
PumpJack
Shell
ShellExplosion
Tank
TankExplosion
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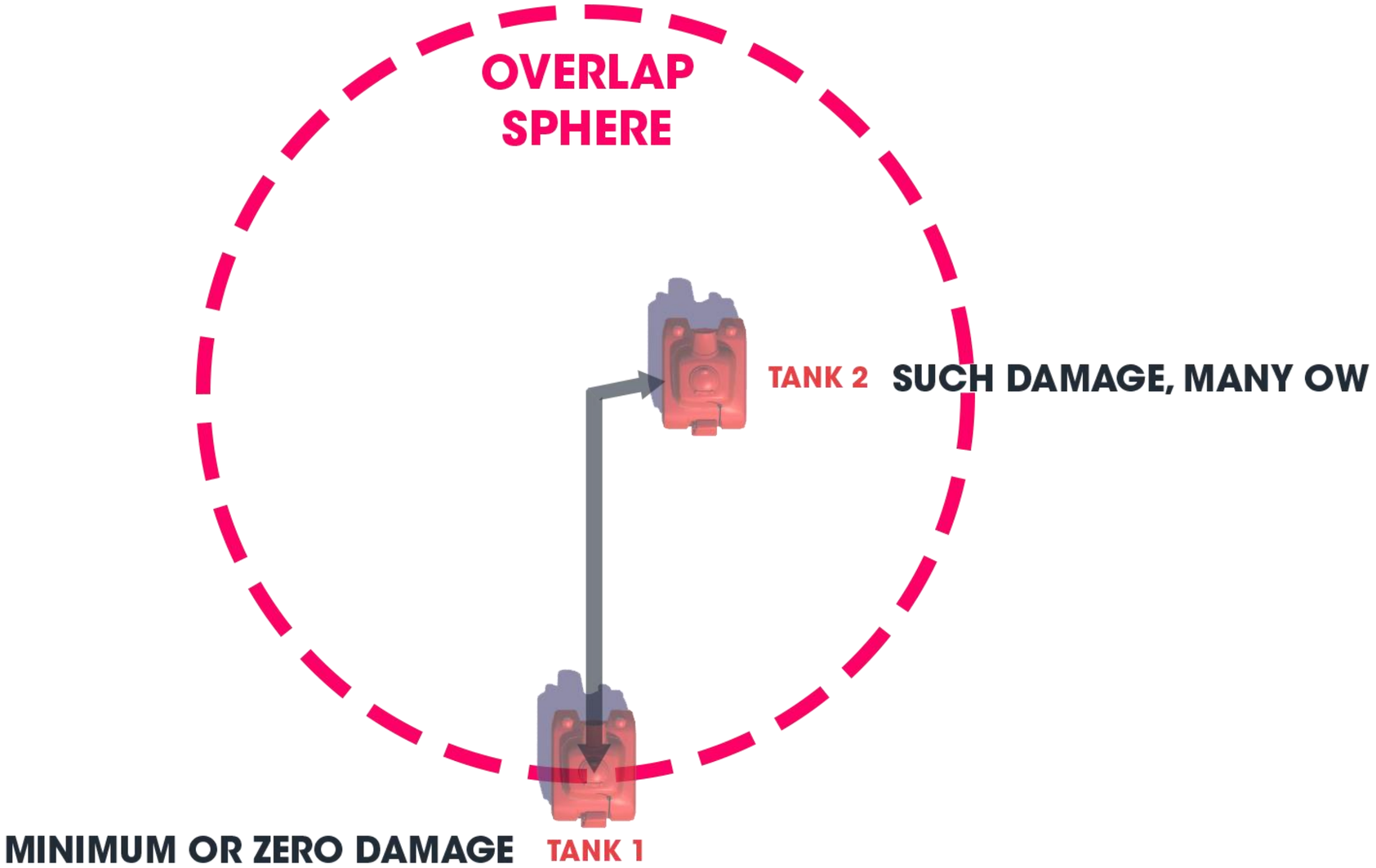
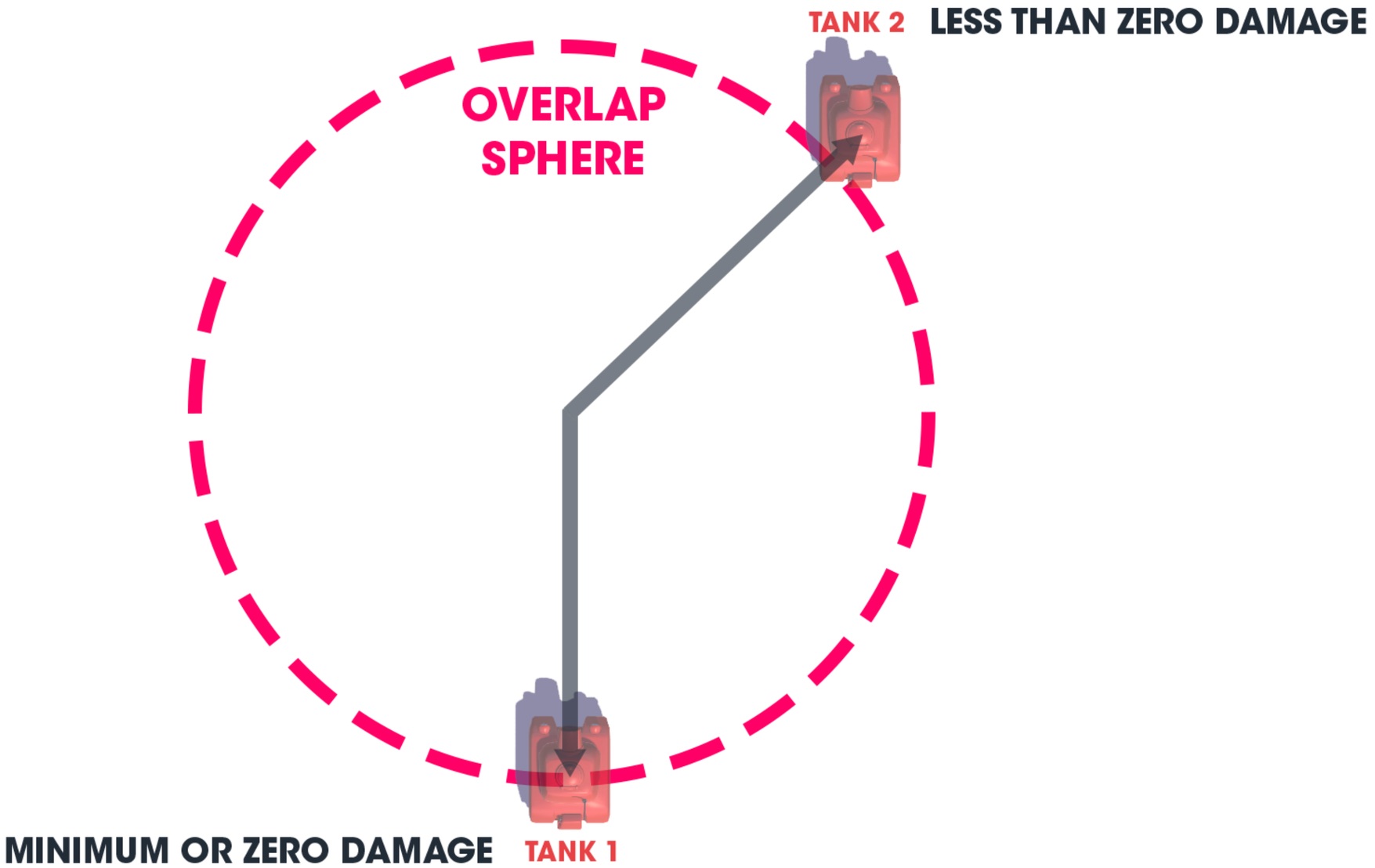
1. Find the prefab **ShellExplosion** in the **Prefabs** folder. **Drag** it onto the **Shell** GameObject to make it a child
2. **Add** an **AudioSource** component to the **ShellExplosion** GameObject

1. In the **Scripts/Shell** folder, find the **ShellExplosion** script, drag it onto the **Shell** GameObject in the **Hierarchy**
2. **Double click** on the **ShellExplosion** script to **open** it for editing


OVERLAP
SPHERE
TANK 2
SUCH DAMAGE, MANY OW
MINIMUM OR ZERO DAMAGE
TANK 1


TANK 2
LESS THAN ZERO DAMAGE
OVERLAP SPHERE
MINIMUM OR ZERO DAMAGE
TANK 1

PHASE SIX

SHOOTING

Pivot
Local
Account
Layers
Layout
Hierarchy
Create
LevelArt
CameraRig
EventSystem
Tank
TankRenderers
LeftDustTrail
RightDustTrail
Canvas
HealthSlider
AimSlider
Fill Area
FireTransform
Inspector
Lighting
FireTransform
Static
Tag
Untagged
Layer
Players
Prefab
Select
Revert
Apply
Transform
Position
X 0
Y 1.7
Z 1.35
Rotation
X 350
Y 0
Z 0
Scale
X 1
Y 1
Z 1
Add Component
Console
Maximize on Play
Mute audio
Stats
Gizmos
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Animators
AudioClips
AudioMixer
Complete
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Assets ▸ Prefabs
DustTrail
LevelArt
PumpJack
Shell
ShellExplosion
Tank
TankExplosion
UNITE 2015

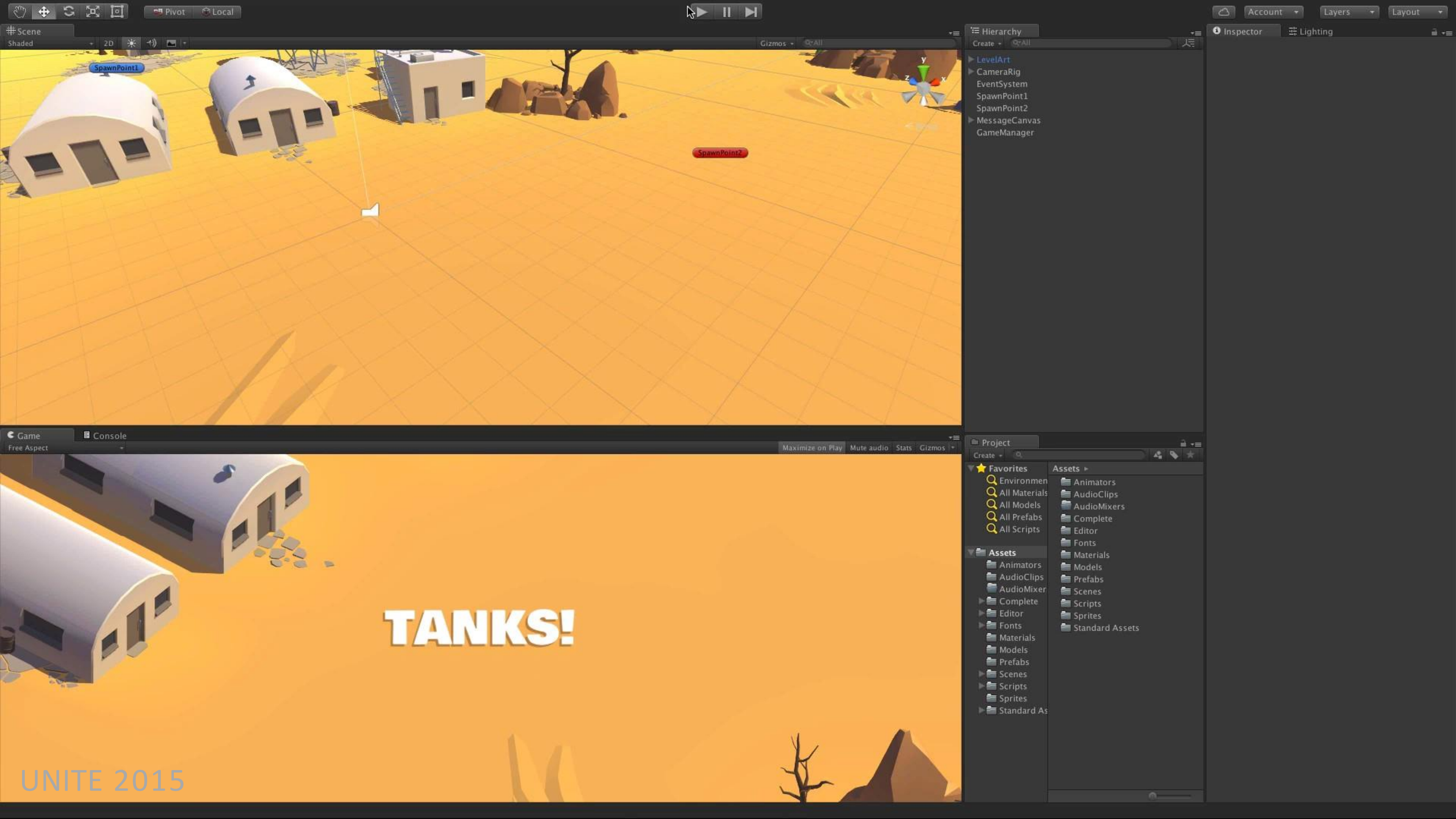
SHOOTING

1. Find the **Shell** prefab in the **Prefabs** folder and **drag** it onto the **Shell** public variable
2. Find the **FireTransform** child GameObject and **drag** it onto the **FireTransform** public variable
3. Find the **AimSlider** GameObject which is a child of the **Canvas** GameObject.

   Drag it onto the **AimSlider** public variable

PHASE SEVEN

MANAGERS


Pivot
Local
Account
Layers
Layout
Scene
Shaded
2D
Gizmos
SpawnPoint1
SpawnPoint2
Hierarchy
Create
LevelArt
CameraRig
EventSystem
SpawnPoint1
SpawnPoint2
MessageCanvas
GameManager
Inspector
Lighting
Game
Console
Free Aspect
Maximize on Play
Mute audio
Stats
Gizmos
TANKS!
Project
Create
Favorites
Environmen
All Materials
All Models
All Prefabs
All Scripts
Assets
Animators
AudioClips
AudioMixer
Complete
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Standard As
Assets
Animators
AudioClips
AudioMixers
Complete
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Standard Assets
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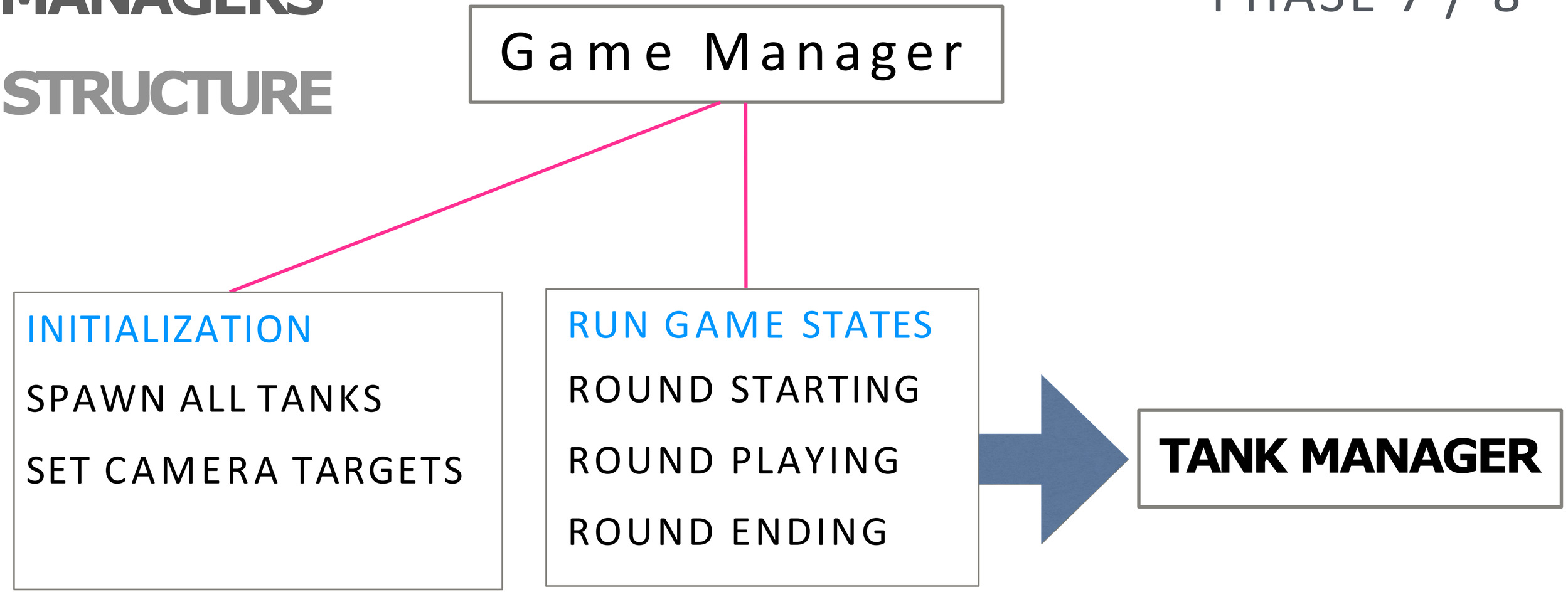
1. In the **Inspector**, to the left of the GameObject's name is an icon for the GameObject's gizmo. Change the gizmo for **SpawnPoint1** to the **blue name tag**
2. Change the gizmo for **SpawnPoint2** to the **red name tag**

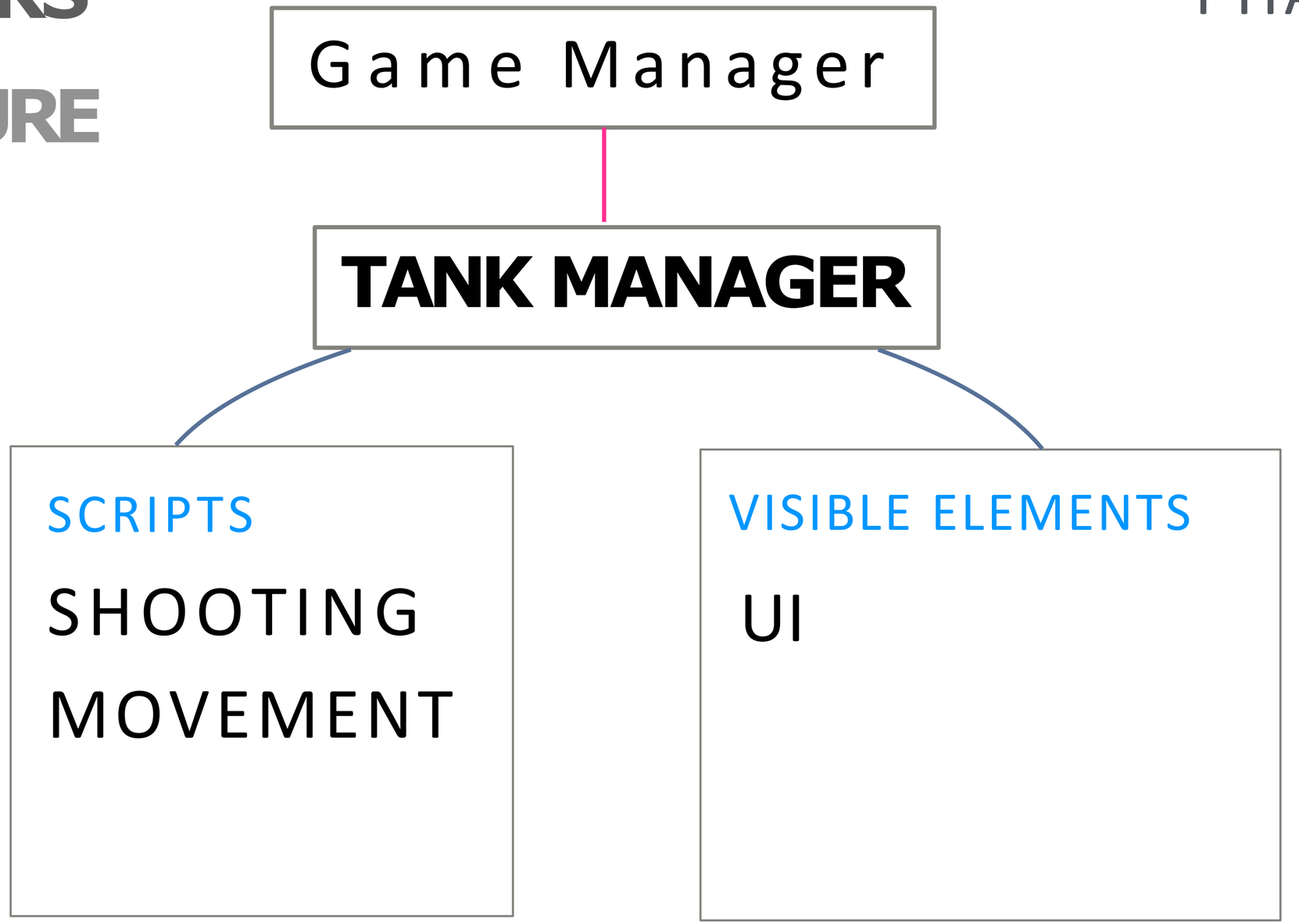
MANAGERS

STRUCTURE

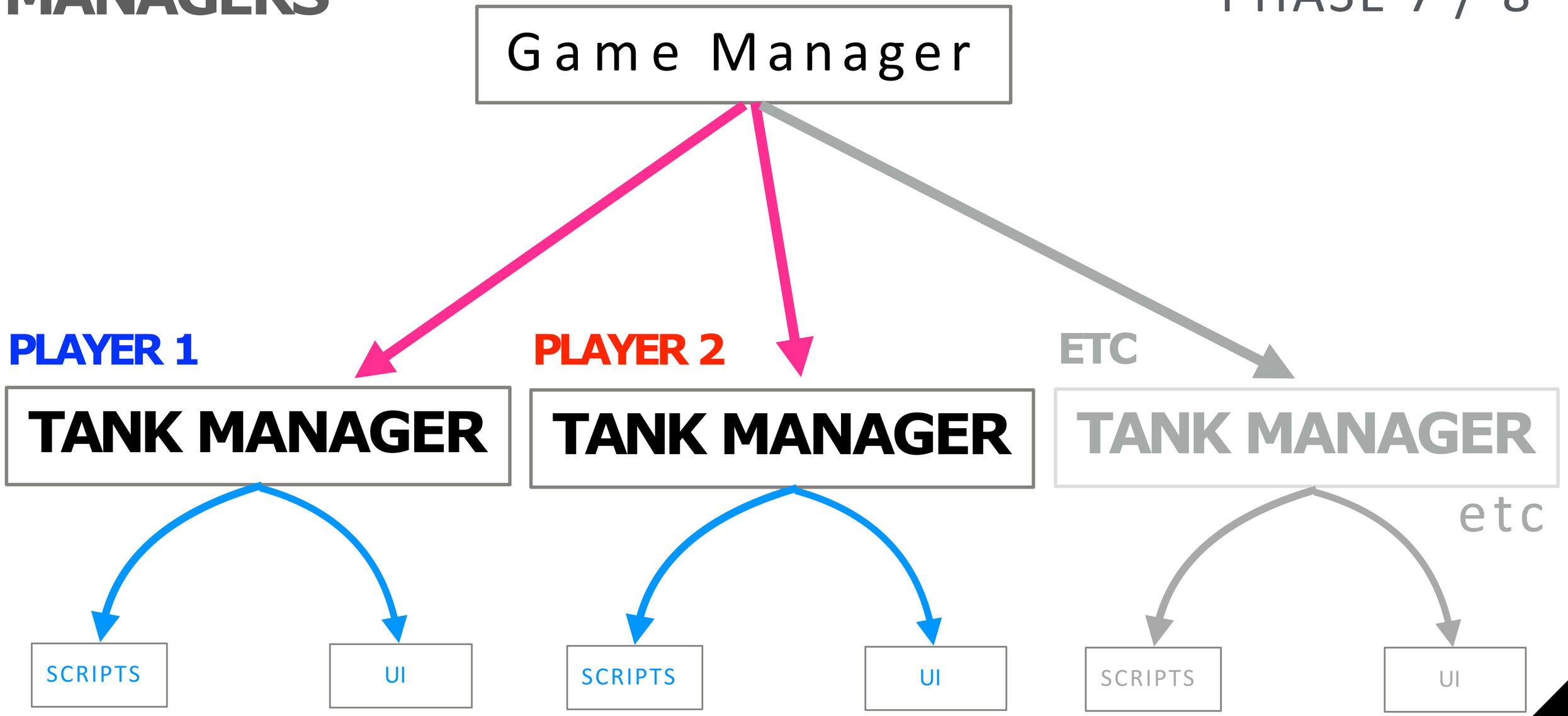


MANAGERS

STRUCTURE



MANAGERS


Game Manager
PLAYER 1
PLAYER 2
ETC
TANK MANAGER
TANK MANAGER
TANK MANAGER
etc
SCRIPTS
UI
SCRIPTS
UI
SCRIPTS
UI

MANAGERS

GAME MANAGER

GameLoop()

RoundStarting()

wait, then..

RoundPlaying()

wait, then..

RoundEnding()

MANAGERS

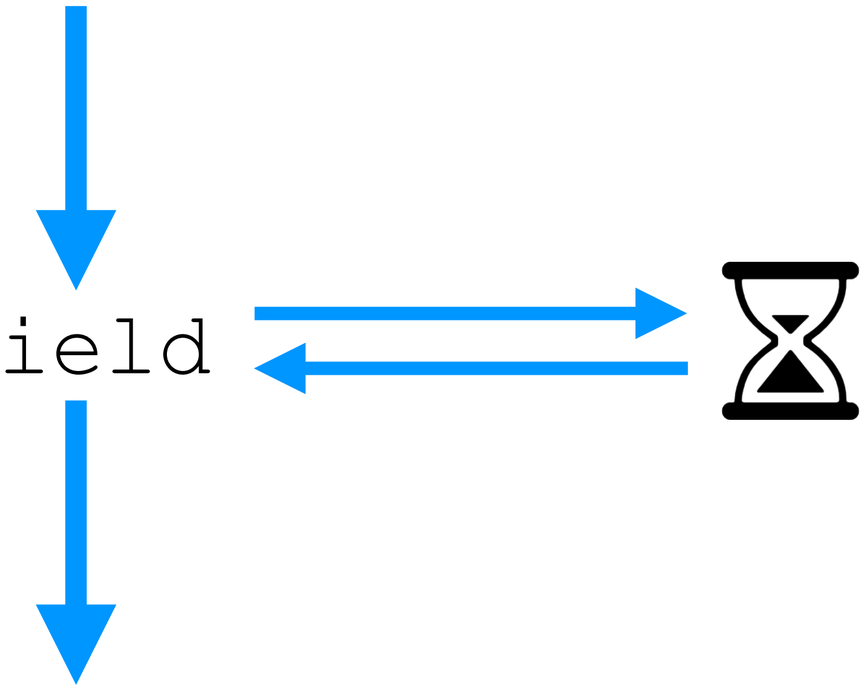
COROUTINES

```
void MyFunction()

{

}
```

MANAGERS

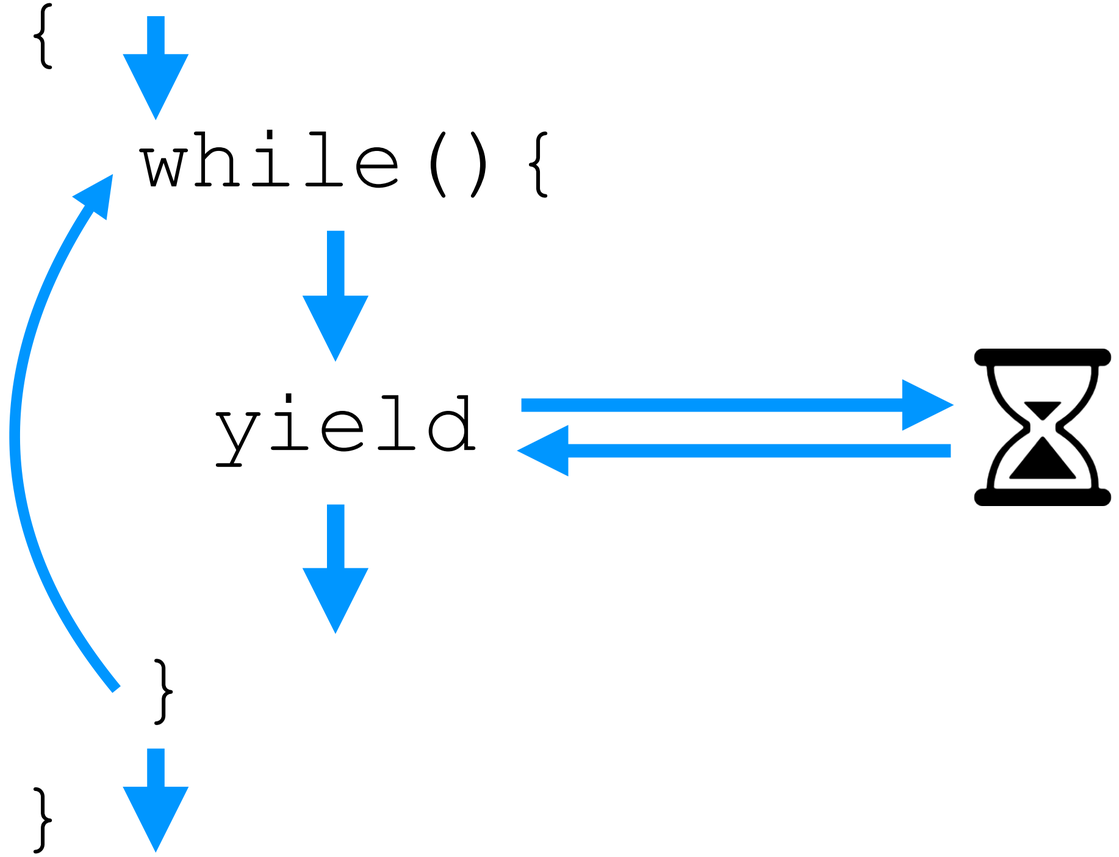
COROUTINES

```
IEnumerator MyCoroutine()
{
    yield
}
```



COROUTINES

```
IEnumerator MyCoroutine()
{
    while(){

        yield

    }
}
```



MANAGERS

GAME MANAGER

GameLoop()

RoundStarting

Round Playing

Round Ending

Reset all tanks

Disable all Tank Controls

Set Camera Pos & Size

Increment Round number

Set Message UI

Enable all Tank Controls

Empty Message UI

Wait for One Tank Left

Disable all Tank Controls

Clear existing & get round winner

Check for Game Winner

Calculate Message UI & Show

TANK MANAGER

Reset()

(De/Reactivate / Position)

DisableControl()

(Cannot Move / Shoot, UI off)

EnableControl()

(Can Move / Shoot, UI on)

PHASE EIGHT

AUDIO

AUDIO

1. With the **GameManager** GameObject **selected**, **click** the **Add Component** button and choose **Audio >Audio Source**.
2. Use the **circle-select** button to set the **Audio Clip** to **BackgroundMusic**
3. **Check Loop**