Welcome to

UNITE

TRAINING DAY

INTRODUCTIONS

INTRODUCTIONS

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R&D CONTENT TEAM CODE WHISPERER

WILL GOLDSTONE

R&D CONTENT TEAM LEAD

@WILLGOLDSTONE

WHAT YOU WILL BUILD

WHAT'S A TRAINING DAY?!

Building a game in 8 phases.

01 - **PROJECT & SCENE SETUP**

02 - **TANK CREATION & CONTROLS**

03 - **CAMERA**

04 - **HEALTH**

05 - **SHELLS**

06 - **SHOOTING**

07 - **GAME MANAGERS**

08 - **AUDIO**

OKAY.

LET'S DO THIS.

PROJECT SETUP

1. **Install** Unity version 5.2 or greater
2. **Download** the project from the asset store,
   just search for Tanks tutorial
3. **Import** the files from the Asset store package

PROJECT SETUP

1. Use **Two by Three** layout using the **Layout** drop-down in the upper right
2. Drag the **Project** window below the **Hierarchy**
3. Set **Project** window zoom to minimum

SCENE SETUP

1. Make sure you have the correct project open and you are in an **empty scene,** if not, go to **File > New Scene**
2. **Save** the empty scene to the **Scenes** folder and call it **Main**

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**

SCENE SETUP

1. At the bottom of the panel **uncheck Auto**
2. Moving up, **uncheck Baked GI**
3. Set **Realtime Resolution** to **0.5**
4. Change **Ambient Source** from **Skybox** to **Color**
5. Set the **Ambient Color** to (**72**, **62**, **113**)
6. Click **Build** on the **Lighting** panel

1. Return to the **Inspector** panel
2. Change the **Position** of the **Main Camera** to (**-43**, **42**, **-25**)
3. Change its **Rotation** to (**40**, **60**, **0**)
4. On the **Camera** component change the **Projection** to **Orthographic**

SCENE SETUP

1. Change **Clear Flags** from **Skybox** to **Solid Color**
2. Change the **Background** color to (**80**, **60**, **50**)
3. **Save your scene!**

END OF
PHASE ONE

PHASE 1 QUIZ

What colour represents the X axis?

a) Blue b) Red c) Yellow d) Green

In which panel can you find a list of all of the game objects in the Scene?

a) Inspector b) Project c) Scene d) Hierarchy

If you want to create an instance of a prefab in your scene, you drag the prefab from the project panel into either of which two panels?

a) Inspector or Hierarchy
b) Inspector or Scene
c) Scene or Hierarchy
d) Game or Inspector

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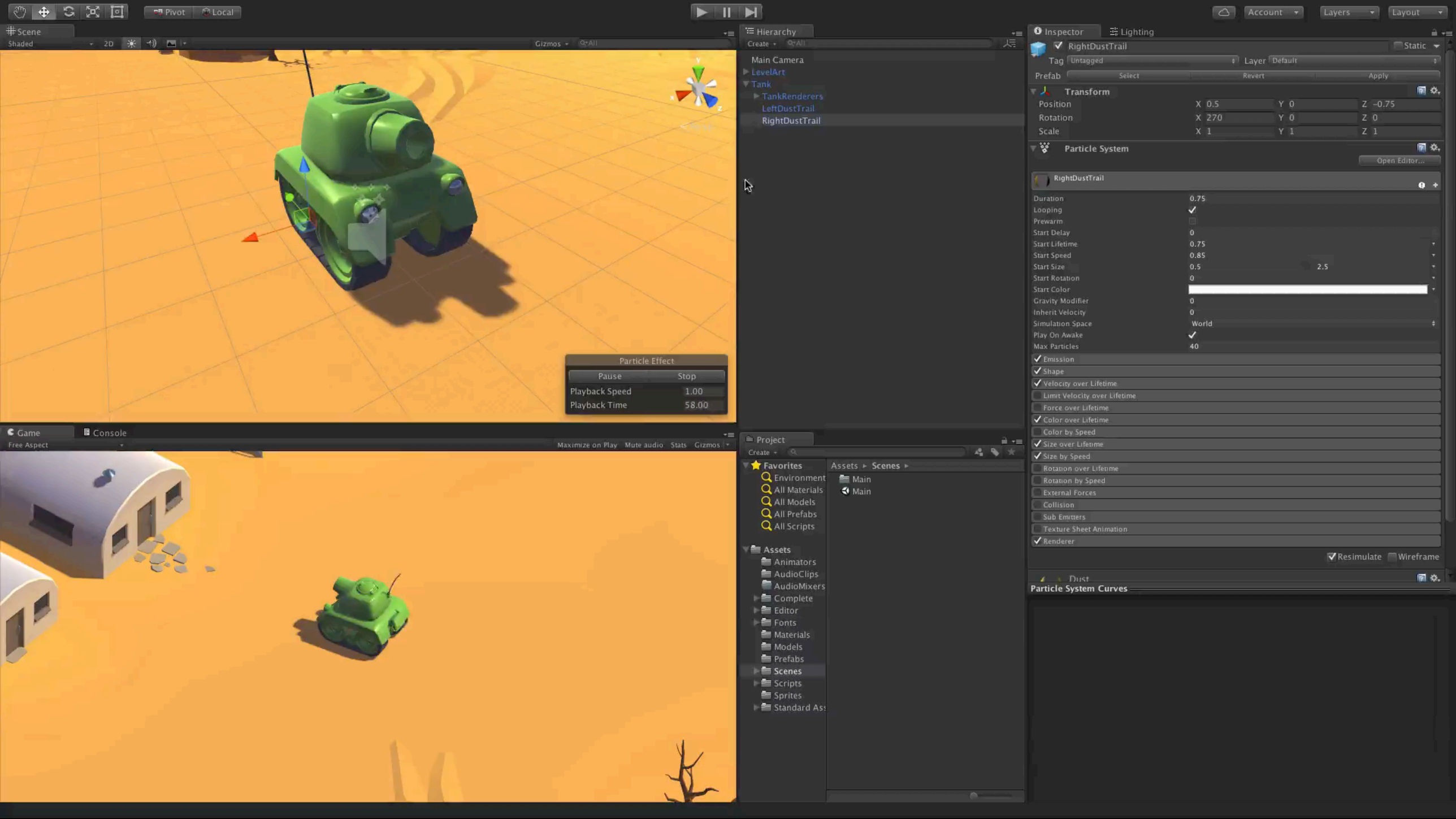
PHASE TWO
TANK CREATION


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

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**

1. **Add** a **Rigidbody** component
2. Expand the **Constraints** area of the **Rigidbody**
3. Under **Constraints** check **Freeze Position** for the **Y axis**
4. Check **Freeze Rotation** for the **X** and **Z axes**

TANK CREATION

1. **Add** a **Box Collider** component to the **Tank** GameObject
2. On the **Box Collider** component change the **Center** to (**0**, **0.85**, **0**)
3. Also, change the **Size** to (**1.5**, **1.7**, **1.6**)

1. **Add** an **Audio Source** component to the **Tank** GameObject
2. On the **Audio Source** component change the **AudioClip** to **EngineIdle** using the **circle-select** button
3. Also check **Loop**

TANK CREATION

1. **Add** another **Audio Source** component
2. On the **second Audio Source** component **uncheck Play On Awake**
3. Select the **Prefabs** folder in the **Project** panel
4. **Click and drag** the **Tank** GameObject from the **Hierarchy** to the **Project** panel
5. **Save** the scene!

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

MOVING

1. **Rename** one of the child GameObjects from **DustTrail** to **LeftDustTrail**
2. Set the **Position** of **LeftDustTrail** to (**-0.5**, **0**, **-0.75**)
3. **Rename** the other **DustTrail** GameObject to **RightDustTrail**
4. Set the **position** of **RightDustTrail** to (**0.5**, **0**, **-0.75**)

MOVING

1. In the **Scripts/Tank** folder, find the **TankMovement** script
2. **Drag and drop** it onto the **Tank** GameObject
3. **Open** the **TankMovement** script using **double click** on the script in the **Project** view

Script Checklist

1. GET THE INPUT
2. SETUP THE AUDIO
3. SETUP FORWARD/BACK MOVEMENT
4. SETUP TURNING

MOVING

1. For the **Movement Audio** variable use the first **Audio Source** component. **Drag** the name of the component and drop it onto the **space next to Movement Audio**
2. For the **Engine Idling** variable, click on the **circle-select** button and choose the **EngineIdle** audio clip from the list

MOVING

1. For the **Engine Driving** variable, click on the circle-select button & choose **EngineDriving**
2. At the top of the **Inspector**, apply the changes to your Tank prefab by clicking **Apply**
3. **Save** your scene using **File > Save**

1. Press **Play** and try driving the tank around!
2. Remember to press Play again to stop playing afterwards
3. **Save** the scene!

END OF
PHASE TWO

PHASE 2 QUIZ

Which of these is a component used to play sounds in a game?

a) Audio Source b) Audio Clip c) Audio Listener d) Audio Mixer

What variable type do we use to store Rotation?

a) Integer b) Vector3 c) Transform d) Quaternion

After the following line of code is run, what will the Rigidbody's position be?

```
m_Rigidbody.MovePosition(new Vector3(0, 0, 10));
```

a) Ten units from it's previous position in the Z axis
b) At the origin
c) At (0, 0, 10)
d) This won't move the Rigidbody

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PHASE THREE
CAMERA


Scene
Shaded
2D
Gizmos
Persp
SpawnPoint1
SpawnPoint2
Camera Preview
Hierarchy
Create
CameraRig
Main Camera
SpawnPoint1
SpawnPoint2
CompleteLevelArt
Directional light
Boundaries
Cliff
Cliff (1)
Cliff (2)
Cliff (3)
Ground
Dunes
Rocks
Cacti
Trees
Military
OilField
Ruins
Helipad
EventSystem
GameManager
MessageCanvas
CompleteTank(Clone)
CompleteTankExplosion(Clone)
CompleteTank(Clone)
CompleteTankExplosion(Clone)
Inspector
Tag
MainCamera
Transform
Position
Rotation
Scale
Add
Game
Console
Free Aspect
Maximize on Play
Mute audio
Stats
Gizmos
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Animators
AudioClips
AudioMixer
Complete
Prefabs
Scenes
Scripts
Editor
Fonts
Materials
Models
Prefabs
Scenes
Scripts
Sprites
Assets
Complete

1. Use the **Create** menu in the **Hierarchy** to create an Empty GameObject by choosing **Create Empty**
2. **Rename** the empty GameObject to **CameraRig**

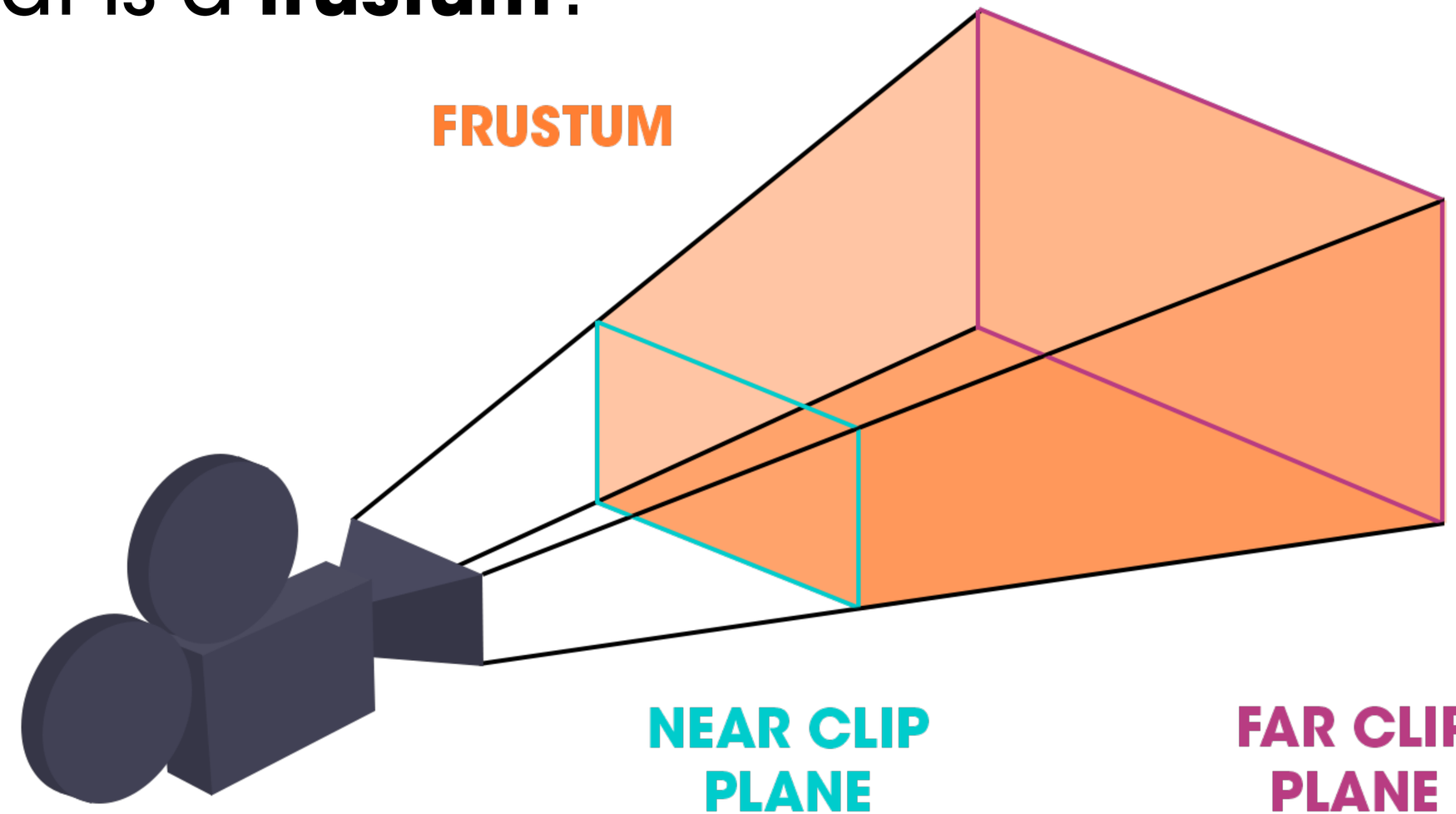
1. Reset its **Position** by **clicking** the **Cog** icon next to its **Transform** component and choosing **Reset Position**
2. Set the **Rotation** of the **CameraRig** to (**40**, **60**, **0**)

CAMERA

1. In the **Hierarchy** drag the **Main Camera** GameObject onto the **CameraRig** GameObject to make it a child
2. Set the **Position** of the **Main Camera** to (**0**, **0**, **-65**)
3. Make sure the **Rotation** of the **Main Camera** is (**0**, **0**, **0**)

CAMERA

- What is a **frustum**?



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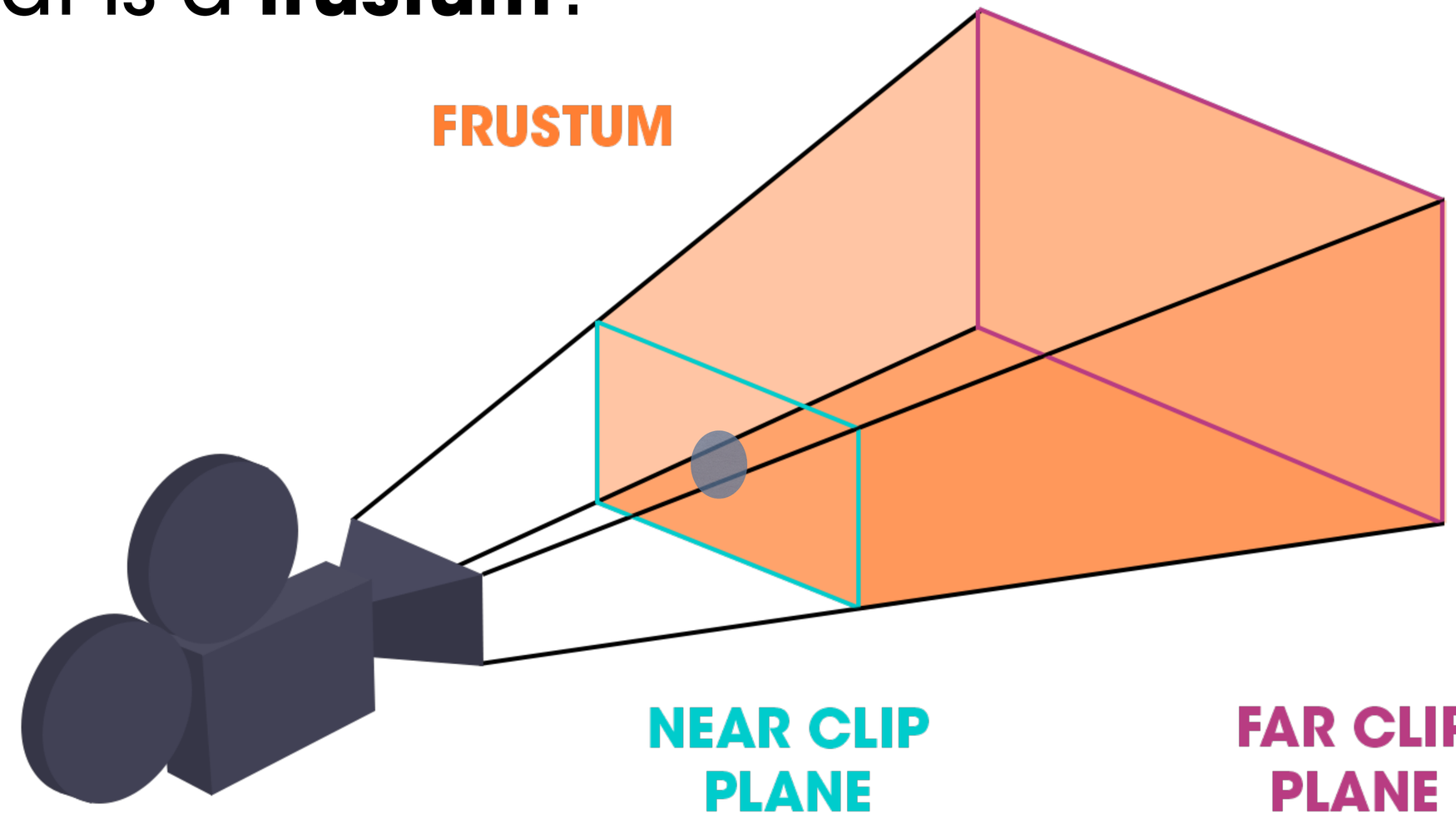

CAMERA

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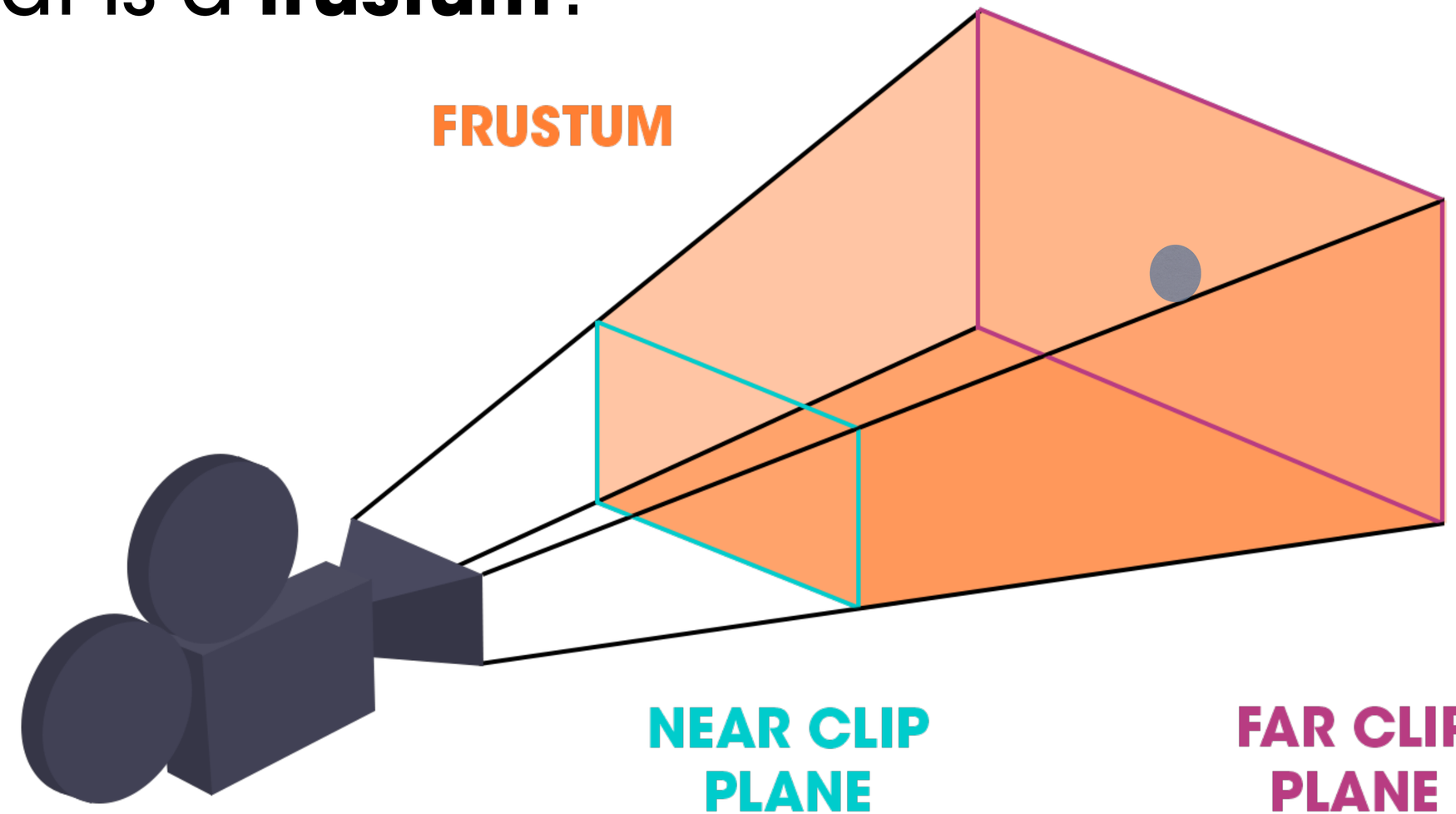
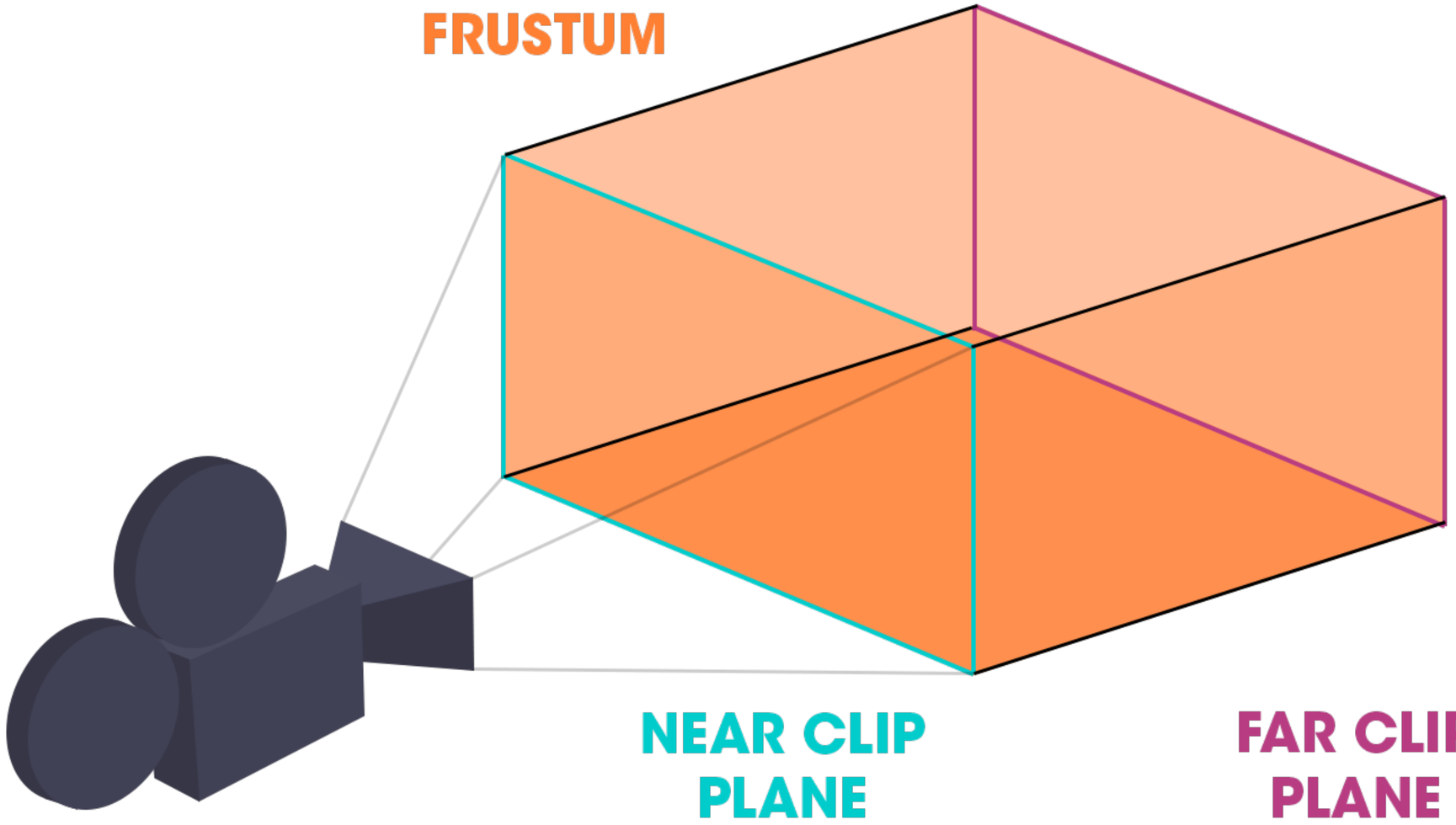
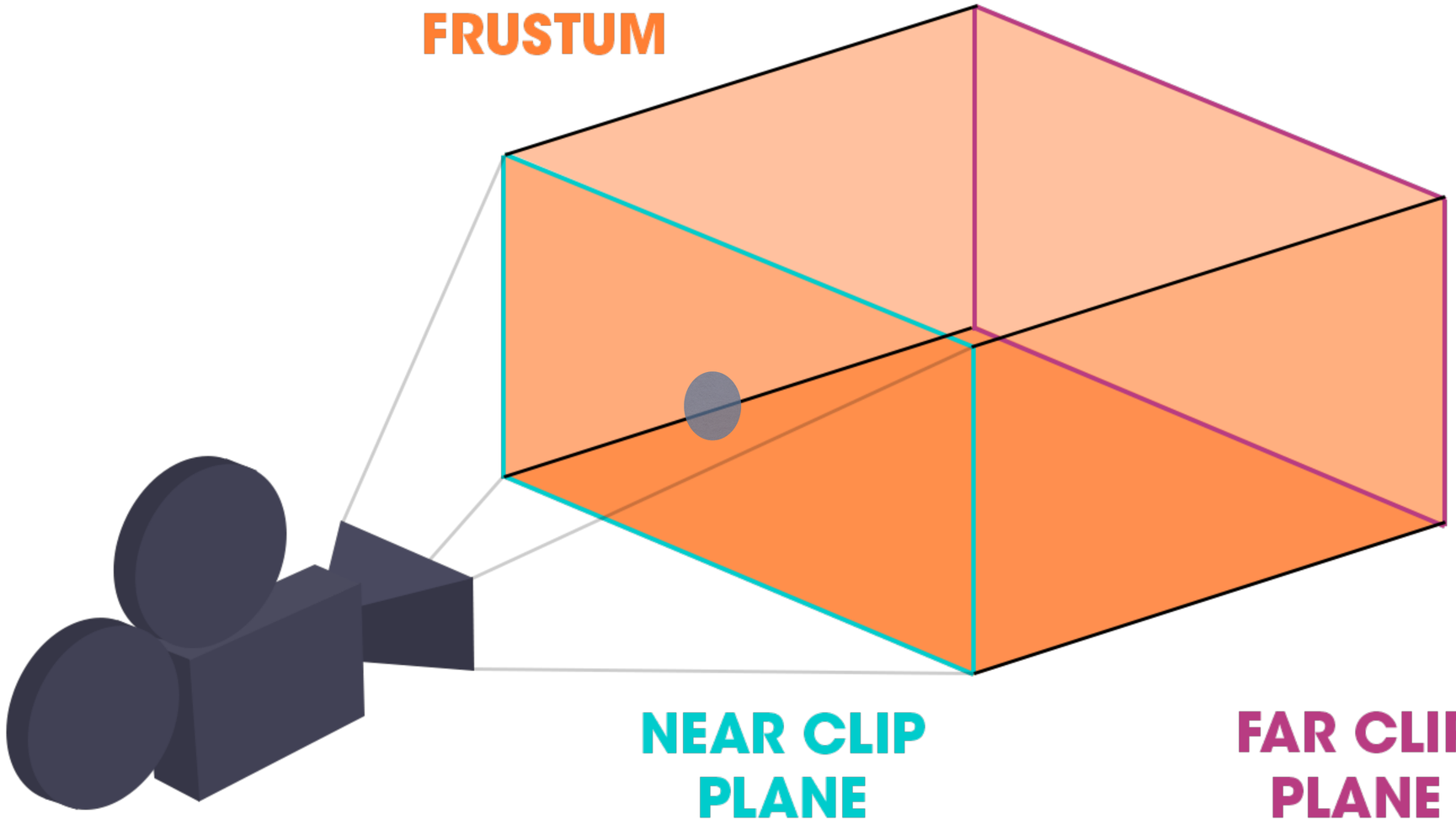


CAMERA

- What is an **orthographic camera**?



- What is an **orthographic camera**?



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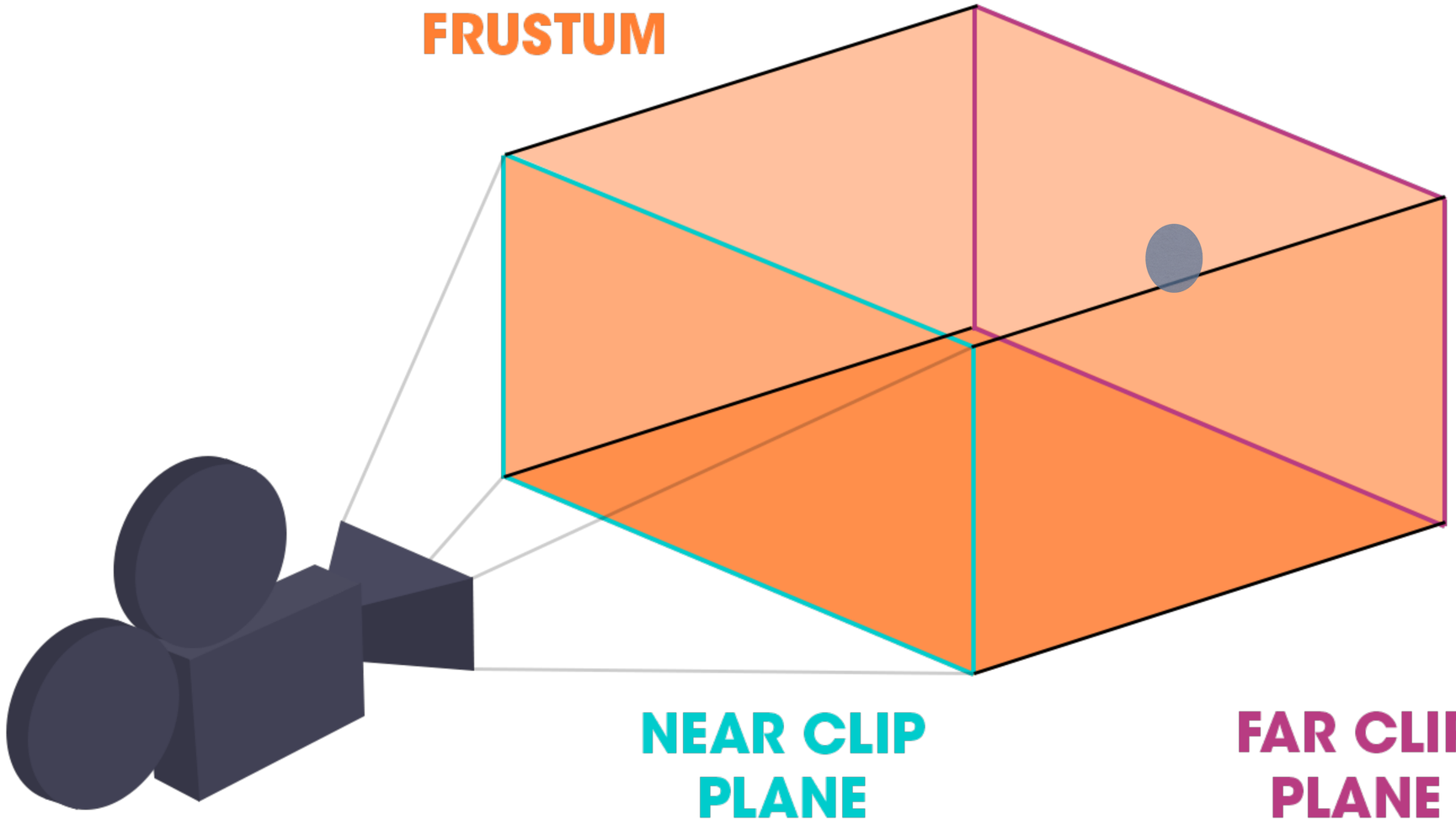

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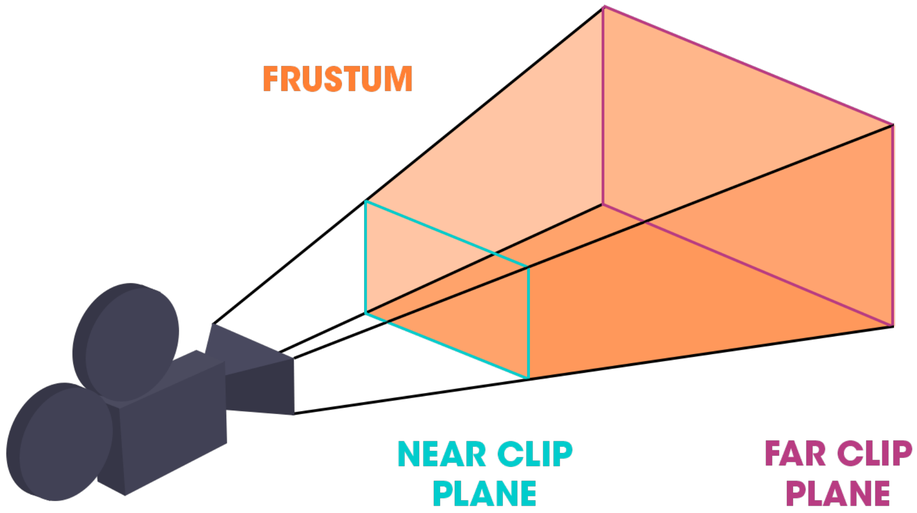
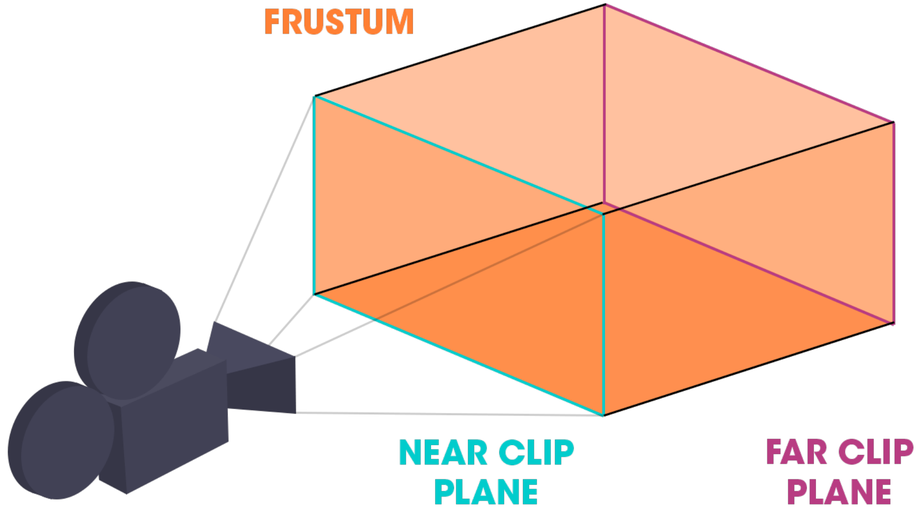
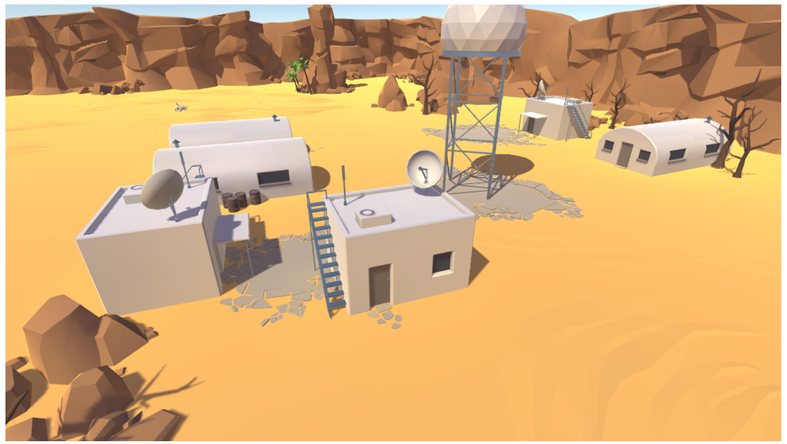
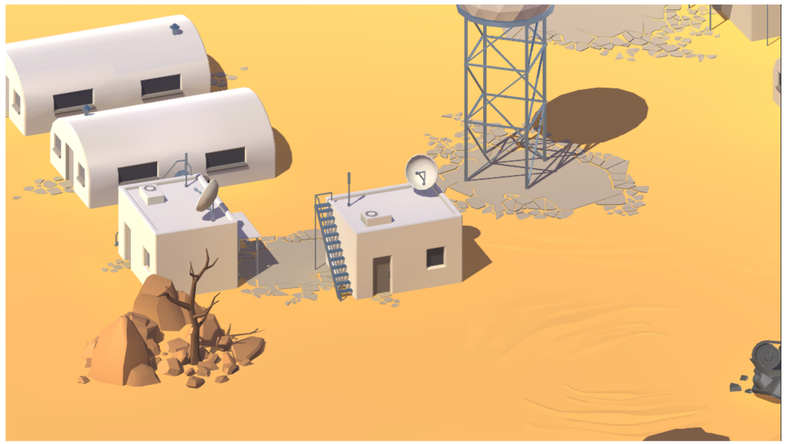
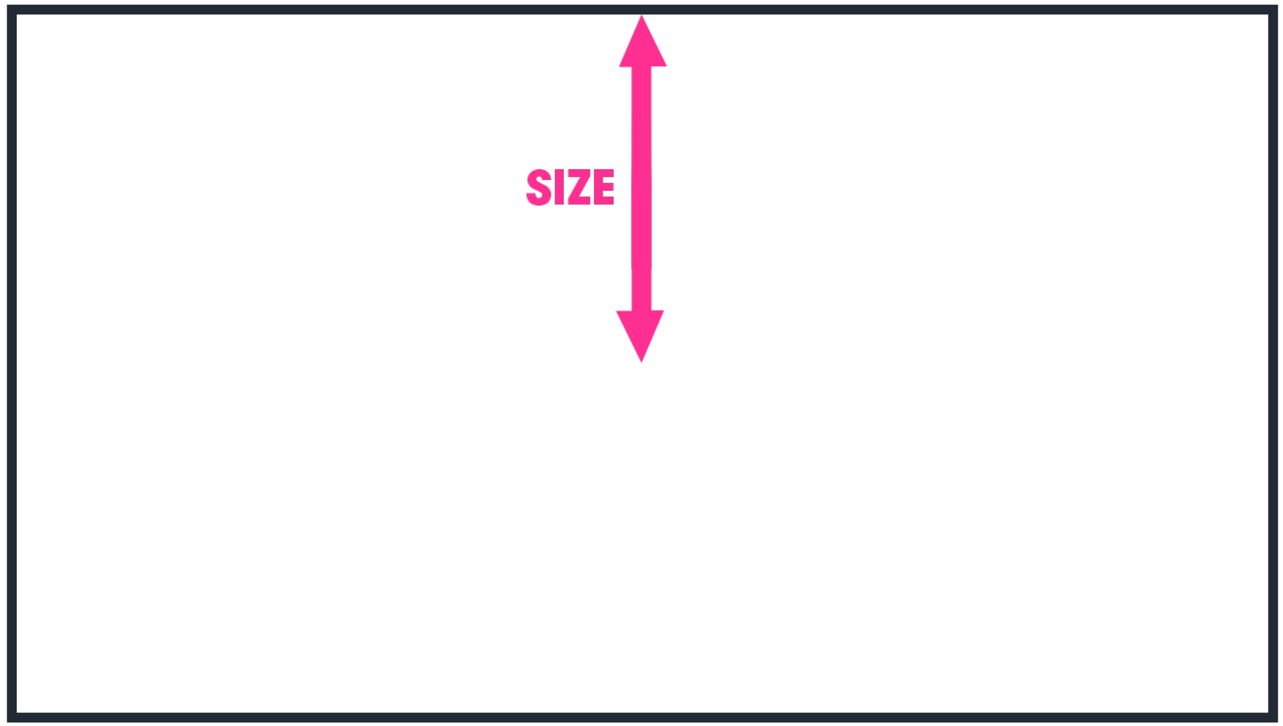






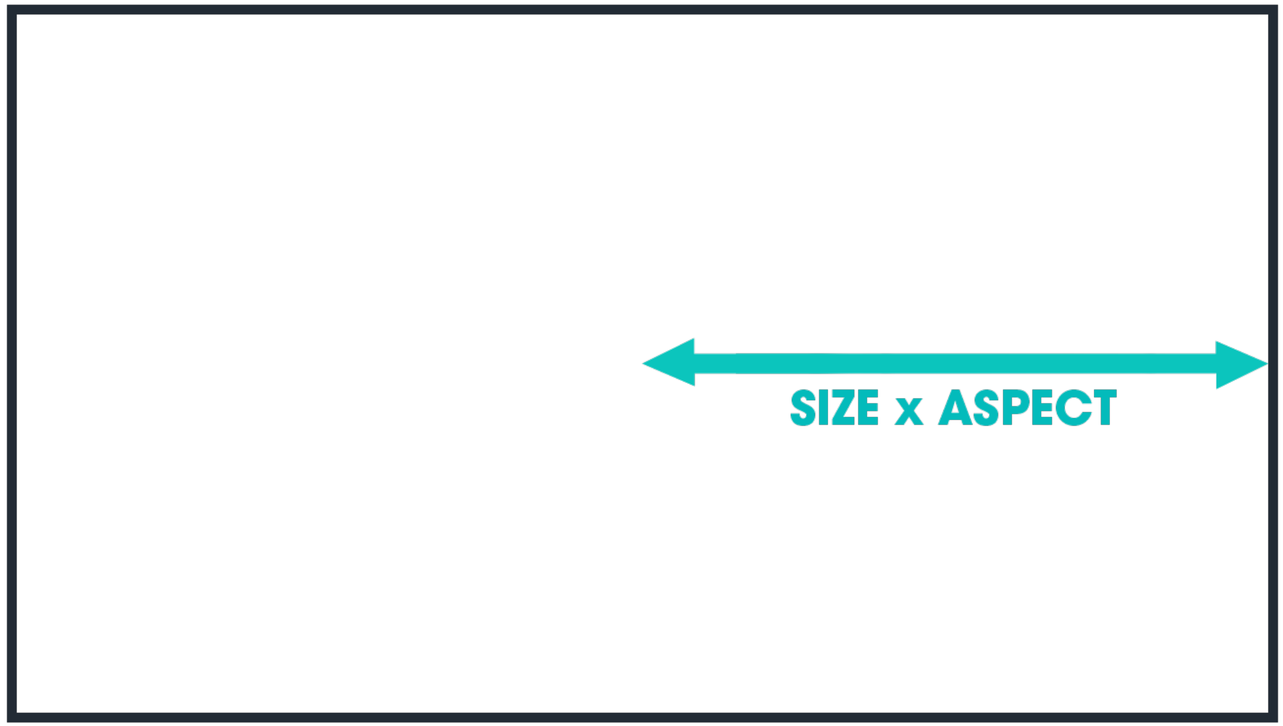


- What is an orthographic camera's **size**?



Remember: We Zoom by setting the **size**.

- What is a camera's **aspect**?



1080p means a screen is **1920 x 1080** pixels

1920 x 1080 is an **aspect ratio** of **16:9**

To find the aspect we divide - the **aspect** of 16:9 is **16 / 9 = 1.778**

What should our camera do?

What should our camera do?

- Follow the tanks

What should our camera do?

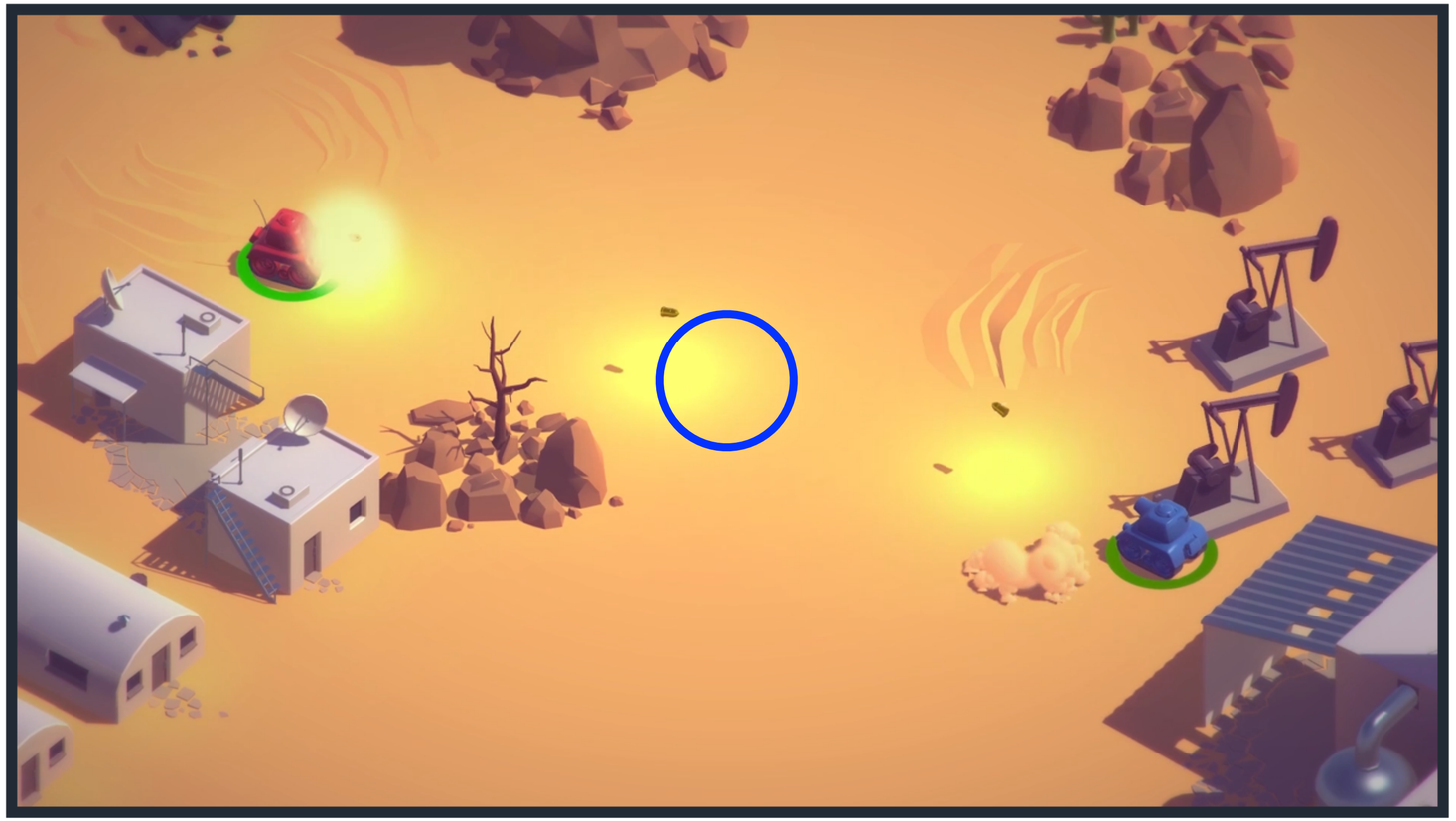
- Follow the tanks
- Re-size (Zoom) to fit the tanks on screen

CAMERA

CAMERA

1. Find the **Scripts/Camera** folder
2. **Drag and drop** the **Camera Control** script onto the **CameraRig** GameObject in the **Hierarchy**
3. **Double click** on the script name on the Component to **open** it

FOLLOWING THE TANKS



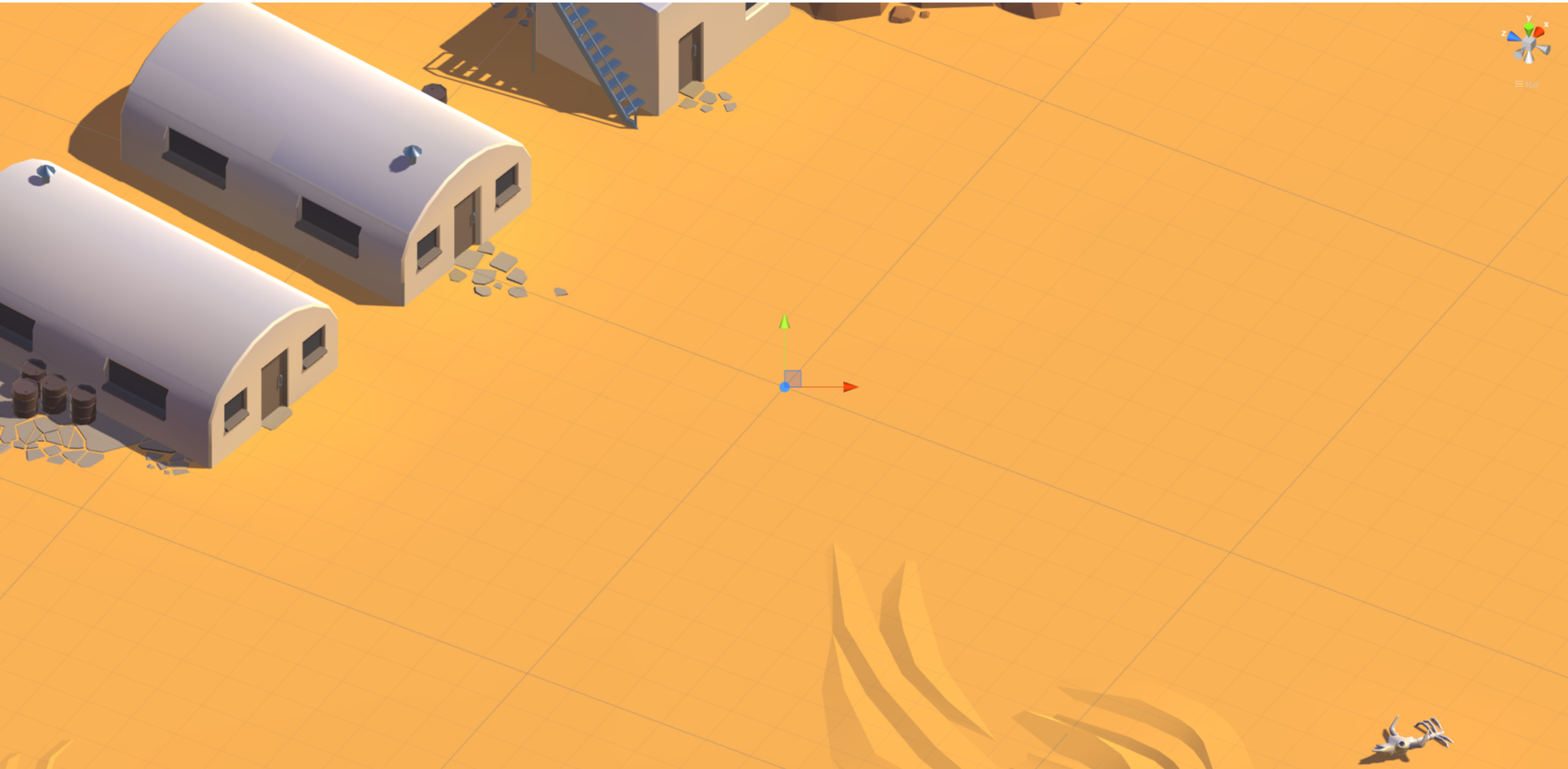
I. Find the Average of the Tanks' positions
II. Set the **CameraRig** to that position each frame

Following the tanks is easy!

What about zoom?

CAMERA

CAMERA



CAMERA

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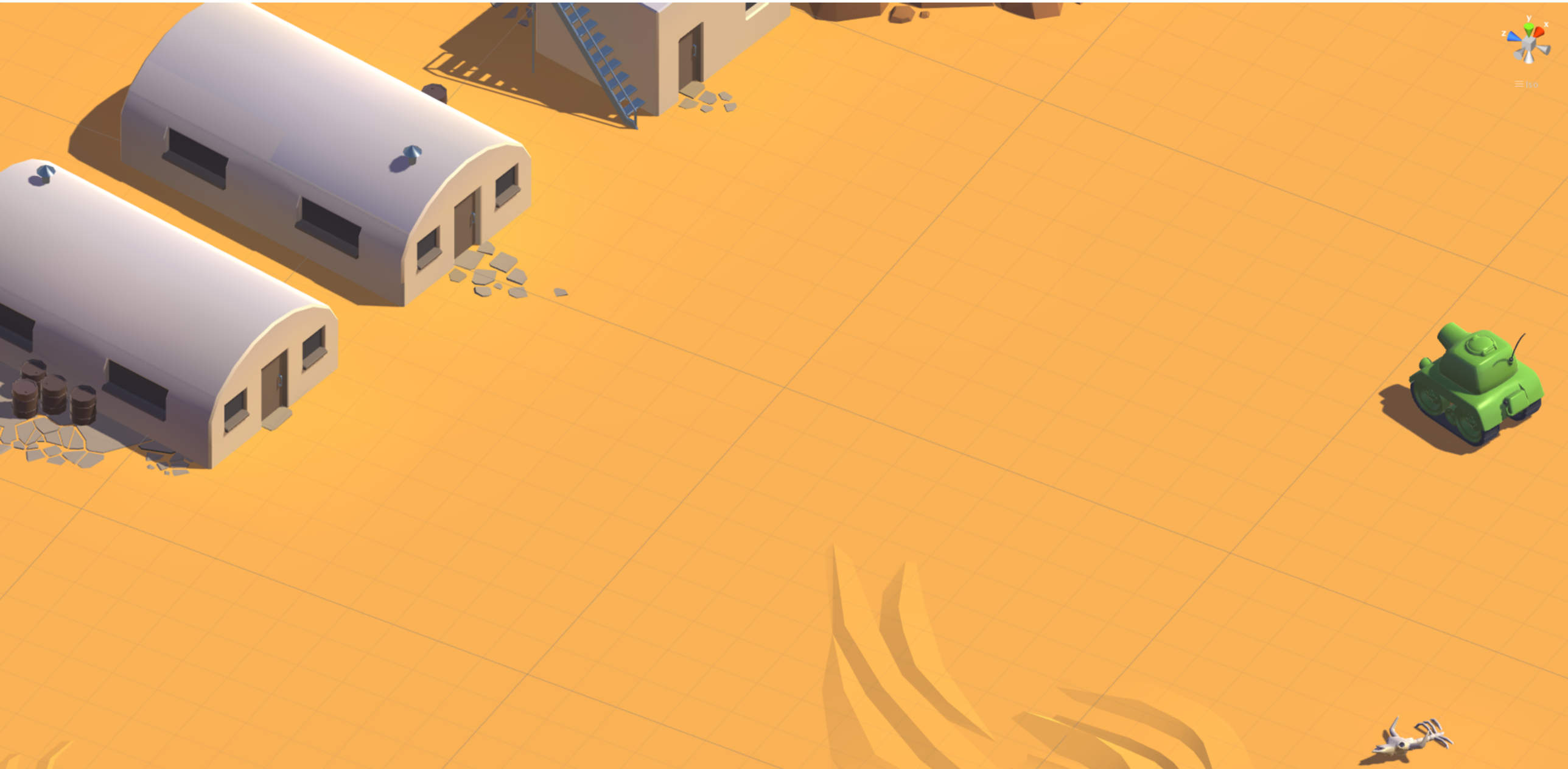
CAMERA

CAMERA



CAMERA

CAMERA

CAMERA

CAMERA

CAMERA


DISTANCE
ASPECT
= SIZE

1. Select the **CameraRig** GameObject
2. **Drag** the **Tank** GameObject onto the name of the public variable **Targets** on the **Camera Control** (script) component

1. Press **Play** and give your game a test
2. Stop Play afterwards! (not pause)
3. **Save** the scene!

END OF
PHASE THREE

PHASE 3 QUIZ

In a game object's Transform component on the Inspector,
what does the property 'Position' display?

a) The world space position
b) The local space position
c) The position relative to it's children
d) The relationship between it's Scale and it's Euler angles rotation

With an orthographic camera, which of the following would have the effect of zooming in?

a) Move the camera's position closer
b) Decreasing the camera's orthographic size
c) Increasing the camera's orthographic size
d) Increasing the camera's aspect

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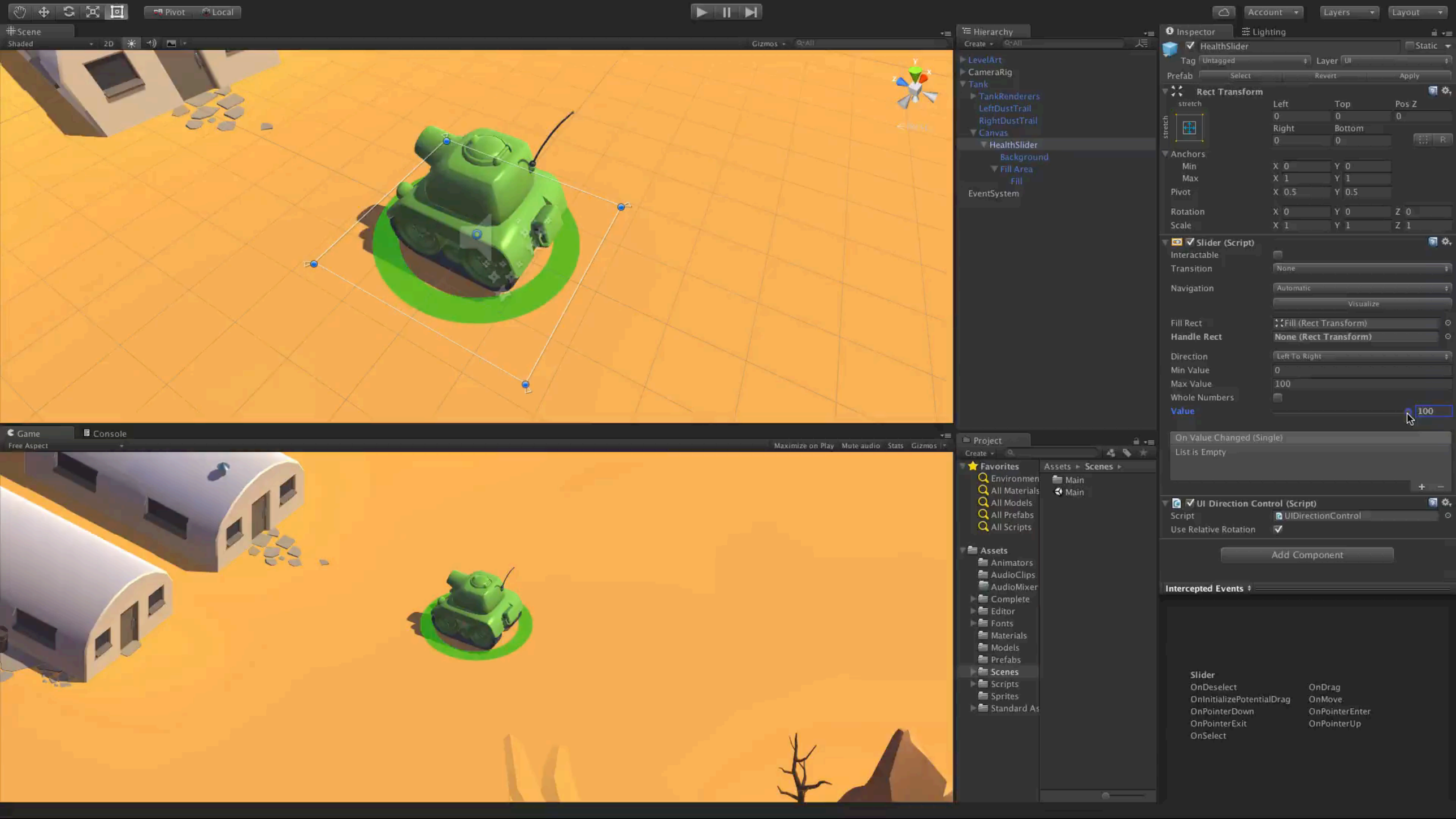
PHASE FOUR
HEALTH


Pivot
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Gizmos
Hierarchy
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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
OnDrag
OnInitializePotentialDrag
OnMove
OnPointerDown
OnPointerEnter
OnPointerExit
OnPointerUp
OnSelect
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

1. Make sure the transform toggle above the Scene View is set to **Pivot** and not **Center**
2. **Create** a **Slider** using **GameObject > UI > Slider** from the top menu

1. Select the **EventSystem** GameObject
2. On the **Standalone Input Module** component change the **Horizontal Axis** to **HorizontalUI**
3. Set the **Vertical Axis** to **VerticalUI**
4. Select the **Canvas** GameObject
5. On the **Canvas Scaler** component change the **Reference Pixels per Unit** to **1**

1. On the **Canvas** component of the **Canvas** GameObject change the **Render Mode** to **World Space**

1. In the **Hierarchy** drag **Canvas** onto the **Tank** GameObject to make it a child
2. Select the **Canvas,** on the **RectTransform** component change **Position** to (**0**, **0.1**, **0**)
3. Change the **Width** and **Height** to **3.5**
4. Change the **Rotation** to (**90**, **0**, **0**)
5. **Save** the scene!

1. Expand the **Canvas** and all of it's children by Alt-clicking the arrow to its left
2. **Select** the **HandleSlideArea** and **delete** it
3. Multi-Select **Slider**, **Background, Fill Area** and **Fill**
4. **Click** on the **Anchor Presets** drop-down and **Alt-Click** on the **lower-right** preset to **stretch** the GameObjects over the entire canvas

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. Rename the **Slider** to **HealthSlider**
2. Select the **Background** GameObject
3. On the **Image** component use the **circle-select** to change the **Source Image** to **HealthWheel**
4. **Click** on **Color** to change the **alpha** (A) to **80**

HEALTH

1. Select the **Fill** GameObject
2. Set the **SourceImage** on the **Image** component to **HealthWheel**
3. Change the **alpha** (A) to **150**
4. Change the **Image Type** to **Filled**
5. Change the **Fill Origin** to **Left**
6. Uncheck **Clockwise**

HEALTH

1. In the **Scripts/UI** folder, find the **UIDirectionControl** script
2. Select the **HealthSlider** GameObject and **add** the **UIDirectionControl** script to it
3. Select the **Tank** GameObject and click **Apply** at the top of the Inspector to update the prefab

1. Find the **TankExplosion** prefab in the **Prefabs** folder. **Drag** it into the **Hierarchy**
2. Add an **AudioSource** component to the **TankExplosion** GameObject
3. Assign the **TankExplosion** Audio Clip to the Audio Source, and uncheck **Play On Awake**

HEALTH

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

Script Checklist

1. SETUP TANK DAMAGE
2. UPDATE UI BASED ON TANK HEALTH
3. TANK DEACTIVATION

HEALTH

1. Select the **Tank** GameObject
2. **Drag and drop** the **HealthSlider** GameObject from the **Hierarchy** onto the **HealthSlider** public variable of the **TankHealth** script
3. Do the same with the **Fill** GameObject for the **Fill Image** public variable
4. Drag & Drop the **TankExplosion** prefab onto the **Explosion Prefab** public variable

1. At the top of the Inspector, **Apply** the changes to the **Tank** prefab.
2. **Save** the scene!

END OF
PHASE FOUR

PHASE 4 QUIZ

What component do all UI game objects have that most game objects do not?
a) Canvas b) Canvas Scaler c) Rect Transform d) Event System

To switch off a Game Object, which code syntax is correct?

a) `gameObject.SetActive(false);`
b) `gameObject.SetEnabled(false);`
c) `gameObject.enabled = false;`
d) `gameObject.activated = false;`

How do you stop the player from being able to drag to adjust the value of a slider?
a) Delete the Handle Slide Area game object
b) Change the Slider's Transition to None
c) Delete the Background game object
d) Uncheck Interactable on the Slider component

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PHASE FIVE
SHELLS


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

1. Find the model named **Shell** in the **Models** folder. **Drag** it into the **Hierarchy**
2. **Add** a **Capsule Collider** component to the **Shell** GameObject
3. Check **Is Trigger** on the **Capsule Collider**

SHELLS

1. Set the **Direction** to **Z-Axis**
2. Change the **Center** of the **Capsule Collider** to (**0**, **0**, **0.2**)
3. Change the **Radius** of the **Capsule Collider** to **0.15** and the **Height** to **0.55**
4. **Add** a **Rigidbody** component to the **Shell** GameObject

SHELLS

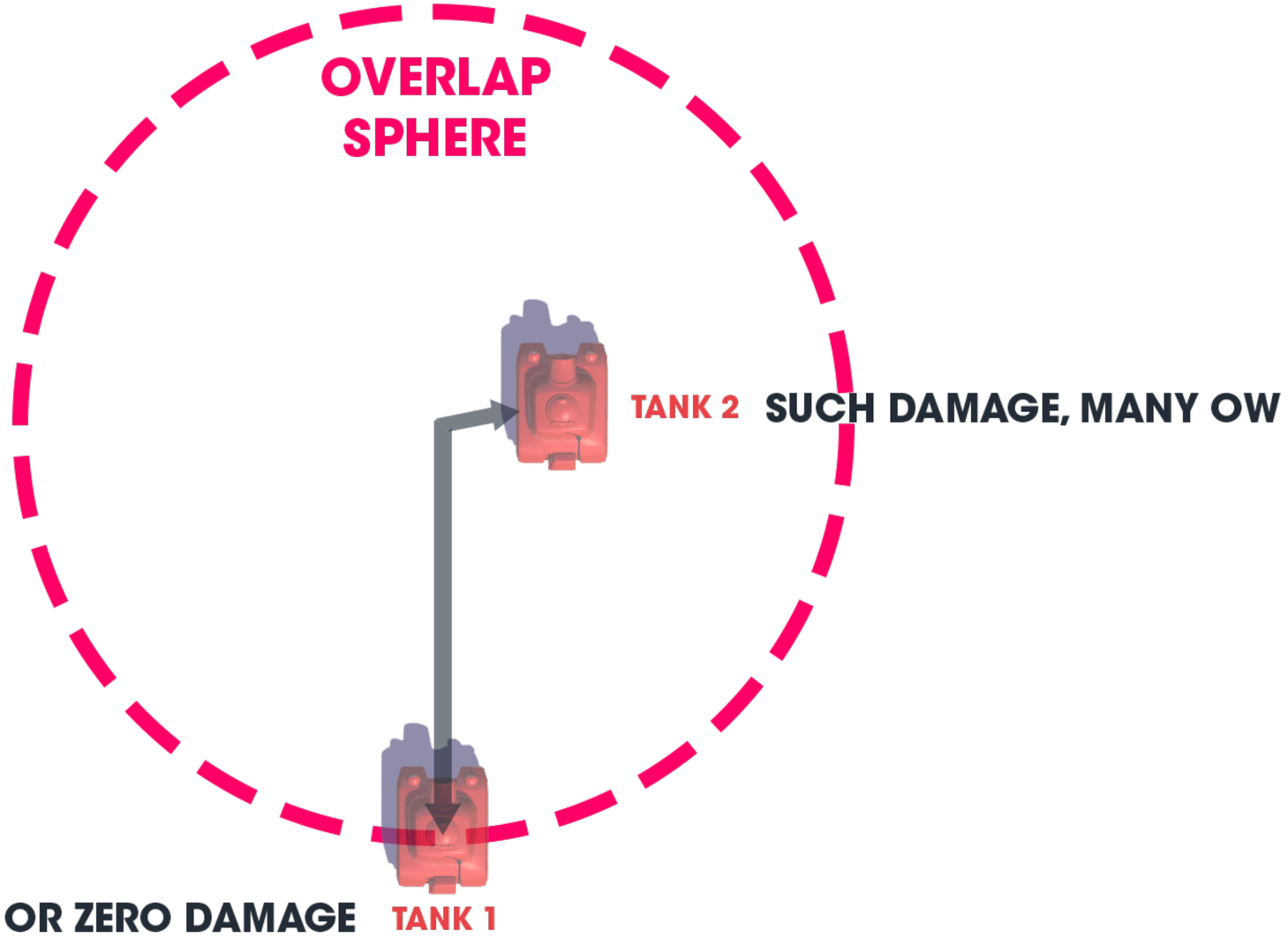
1. Find the prefab **ShellExplosion** in the **Prefabs** folder. **Drag** it onto the **Shell** GameObject to make it a child
2. **Add** an **AudioSource** component to the **ShellExplosion** GameObject

1. Use the **circle-select** to set **AudioClip** of the **AudioSource** to **ShellExplosion**
2. Uncheck **Play On Awake** on the **AudioSource**

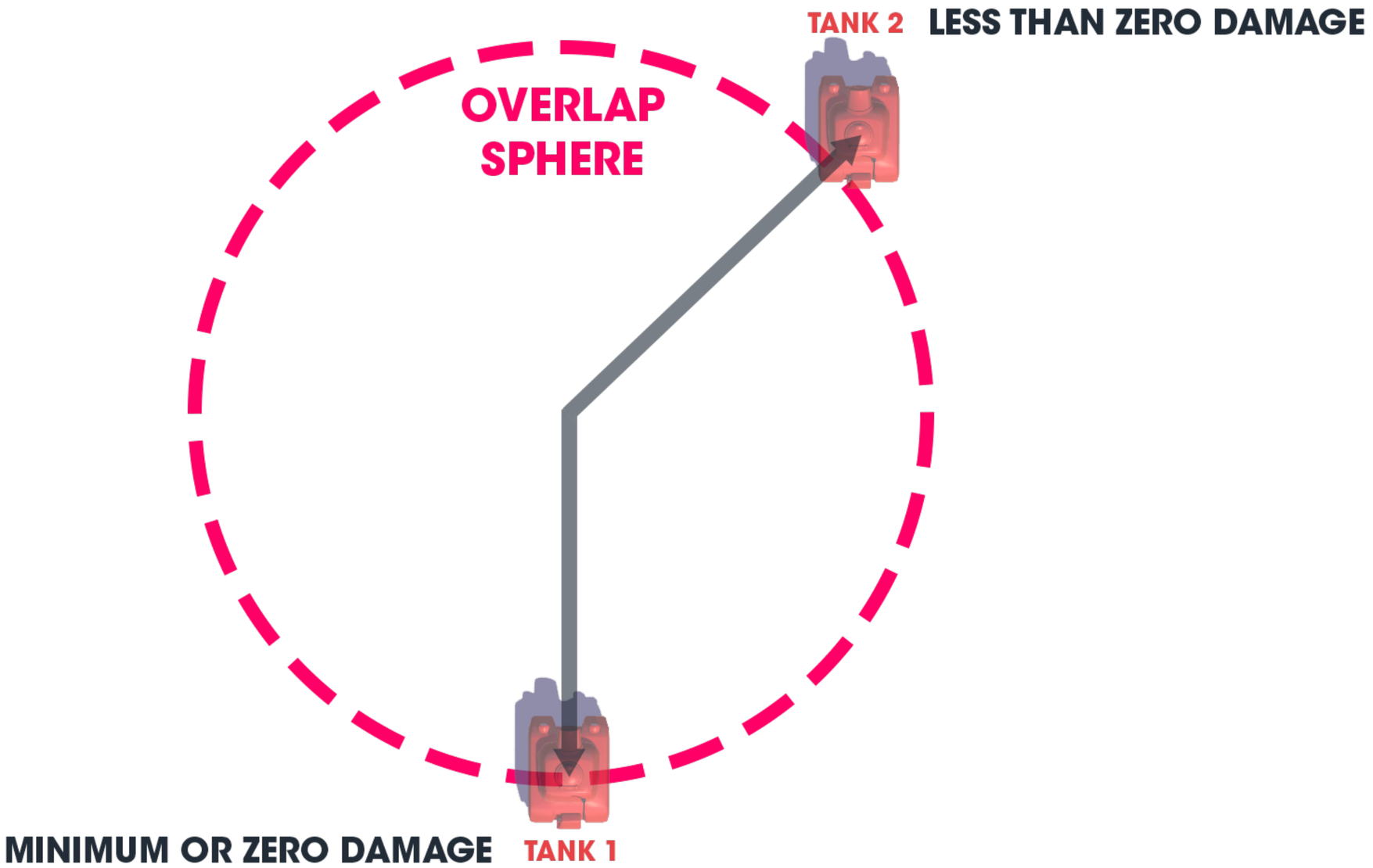
1. **Reselect** the **Shell** GameObject
2. Add a **Light Component**

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

SHELLS


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

SHELLS


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

Script Checklist

1. FIND TANKS TO AFFECT
2. APPLY DAMAGE TO AFFECTED TANKS
3. APPLY FORCE TO AFFECTED TANKS
4. PLAY SOUND AND PARTICLE EFFECTS
5. TIDY REMAINING GAME OBJECTS

SHELLS

1. With the **Shell** GameObject still selected **drag** the child GameObject called **ShellExplosion** onto the **Explosion Particles** and **Explosion Audio** public variables
2. Set the **Tank Mask** public variable to **Players**
3. Drag the **Shell** GameObject to the **Prefabs** folder in the **Project** panel to save it as a prefab

1. **Delete** the **Shell** GameObject from the **Hierarchy**
2. **Save** the scene!

END OF
PHASE FIVE

PHASE 5 QUIZ

What type does the Physics.OverlapSphere function return?

a) `Collider[]` b) `Transform[]` c) `Rigidbody[]` d) `GameObject[]`

What must be changed in the Inspector of a Capsule Collider for OnTriggerEnter to be called for that collider?

a) A trigger material must be used
b) The center must be offset
c) The radius must be sufficiently small that it is less than the offset's distance
d) The Is Trigger checkbox must be checked

Why is there an f after some numbers in code?

a) The f replaces the decimal place when writing numbers less than 1
b) The f stands for figure and tells the compiler to keep the number constant
c) The f stands for forbidden, telling the compiler never to use them. like ever.
d) The f stands for float, and tells the compiler to treat it as a floating point number

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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
Gizmos
Console
Maximize on Play
Mute audio
Stats
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

1. **Select** the **Tank** GameObject in the **Hierarchy**
2. **Right-click** on the **Tank** GameObject and choose **Create Empty**
3. **Rename** the child GameObject to **FireTransform**
4. Set the **Position** of **FireTransform** to (**0**, **1.7**, **1.35**)
5. Set the **Rotation** of **FireTransform** to (**350**, **0**, **0**)

1. **Right-click** on **Canvas** in the Hierarchy and choose **UI > Slider**
2. Rename the new **Slider** to **AimSlider**
3. Alt-click the arrow to the left of **AimSlider** to **Expand** the GameObject so that its children are visible in the **Hierarchy**
4. **Delete** the **Background** and **Handle Slide Area** GameObjects

1. **Reselect** the **AimSlider** GameObject and find the **Slider** component in the **Inspector**
2. Uncheck **Interactable**
3. Set the **Slider** component's **Transition** to **None**
4. Set **Direction** to **Bottom To Top**
5. Set the **Min Value** to **15**
6. Set the **Max Value** to **30**

1. Multi-Select the **AimSlider** and **Fill Area** GameObjects
2. In their **Rect Transform** components **click** on the **Anchor Presets** drop down and **alt-click** the **lower-right** option to **Stretch** the GameObjects vertically and horizontally over the canvas

1. Expand **Fill Area** and select the **Fill**
2. On the **Rect Transform,** set **Height** to **0** to remove offsets from the parent Rect
3. On the **Fill** GameObject, for the **Image** component use the **circle-select** button to change the **Source Image** to **Aim Arrow**

1. Select the **AimSlider** GameObject
2. Use the **Rect Tool** (T) to drag the Left / Right bounds of the Rect so that its as narrow as the Tank
3. Drag the **AimSlider** forward & up from the Tank, then drag out the top edge to make a longer slider
4. Our values are **(1, -9, -1, 1, 3)**

1. Find the **TankShooting** script in the **Scripts/Tank** folder
2. **Drag and drop** it onto the **Tank** GameObject in the **Hierarchy**
3. **Double-click** on the **TankShooting** script in the **Project** panel to **open** it for editing

Script Checklist

1. CHECK FIRE BUTTON STATE
2. UPDATE FIRING CHARGE
3. INSTANTIATE SHELL WHEN BUTTON RELEASED
   OR AT MAXIMUM CHARGE

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

1. Find the **second Audio Source** on the **Tank** GameObject.

   This is the one with no clip assigned as well as **Loop** and **Play On Awake** unchecked
2. **Drag and drop** the name of this **Audio Source** onto the **Shooting Audio** public variable of the **TankShooting** script

1. Use the **circle-select** button to set the **Charging Clip** variable to **ShotCharging**
2. Likewise use the **circle-select** button to set the **Fire Clip** variable to **ShotFiring**
3. Ensure the **Tank** GameObject is still selected and click **Apply** at the top of the Inspector to update the prefab

1. The **Tank** is now finished! Give it a test!
2. MAKE SURE THAT ALL CHANGES ARE APPLIED to the **Tank** prefab by pressing **Apply** at the top of the **Tank** GameObject's **Inspector**
3. **Delete** the **Tank** GameObject from the scene
4. **Save** the scene!

END OF
PHASE SIX

PHASE 6 QUIZ

What component is used to create the visual parts of a UI slider?
a) Image b) Sprite c) Slider d) It must be done with a custom script

Which of the following functions returns true whenever an input button is held?

a) `Input.GetButton`
b) `Input.GetButtonDown`
c) `Input.GetButtonUp`
d) `Input.GetAxis`

A Rigidbody's velocity is of which type?
a) float
b) Transform
c) Vector3
d) Velocity

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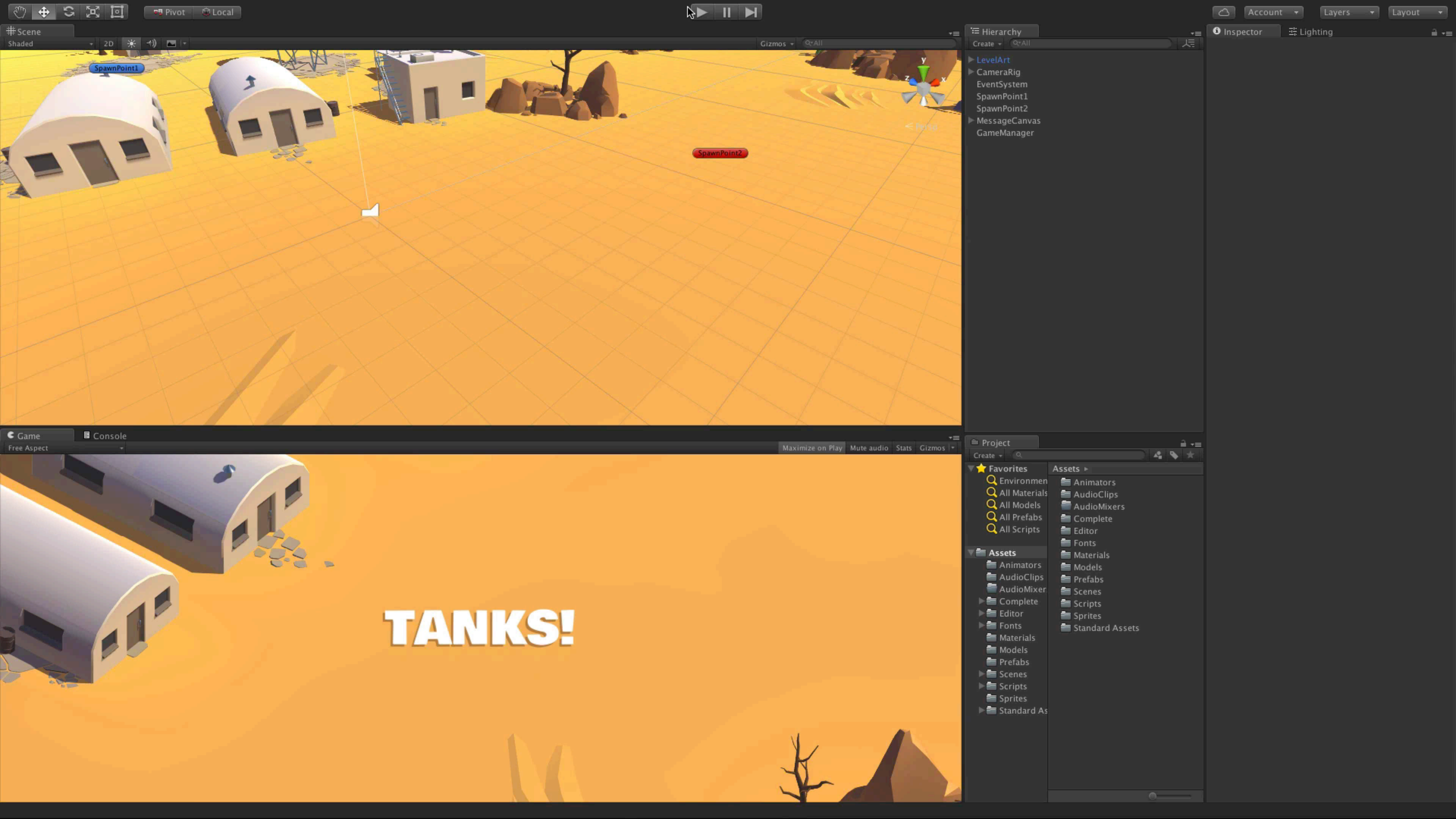
PHASE SEVEN
MANAGERS


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

1. Create two empty GameObjects by going to the **Create** menu in the **Hierarchy** and selecting **Create Empty - twice!**
2. **Rename** the empty GameObjects to **SpawnPoint1** and **SpawnPoint2**

1. Position **SpawnPoint1** at (**-3**, **0**, **30**)
2. Set the Rotation of **SpawnPoint1** to (**0**, **180**, **0**)
3. Position **SpawnPoint2** at (**13**, **0**, **-5**)
4. Ensure the Rotation of **SpawnPoint2** is (**0**,**0**,**0**)

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

1. Go to **GameObject > UI > Canvas**

   to create a new canvas GameObject
2. **Rename** it **MessageCanvas**
3. On the Scene view, click on the **2D** button to

   enable 2D mode
4. With the **MessageCanvas selected** and the

   mouse cursor over the Scene view **press F** to frame

   the selected **MessageCanvas**

1. Right-click **MessageCanvas** and choose **UI > Text** to create a **Text** GameObject as a child of the **MessageCanvas**

1. On the **RectTransform** component of the **Text** GameObject set the **Anchors** for the **X** and **Y** **axes** to have a **Min** of **0.1** and a **Max** of **0.9**
2. Set the **Left**, **Right**, **Top**, **Bottom** and **Pos Z** to **0**

1. On the **Text** component set the **Text** to be "**TANKS!**"
2. Use the **circle-select** button to change the **Font** to **BowlbyOne-Regular**
3. Change the **Alignment** to **centre** and **middle**

1. **Enable Best Fit**
2. Set the **Max Size** to **60**
3. Set the **Color** to White (**255**, **255**, **255**, **255**)

1. **Click** the **Add Component** button and type **Shadow** in the search bar
2. **Click** on the **Shadow** component in the list to add it to the **Text** GameObject
3. Set **Effect Color** to Brown (**114**, **71**, **40**, **128**)
4. Set the **Effect Distance** to (**-3**, **-3**)
5. Disable **2D** Mode on the Scene View

1. **Select** the **CameraRig** GameObject
2. Go to **Edit > Frame Selected** (Shortcut - F)
3. On the **CameraControl** (script) component, set the **Targets** array to a size of **0** by typing into the **Size** property, and pressing Return
4. **Double click** on the **CameraControl** script to **open** it for editing

MANAGERS

1. Click the **Create** button on the **Hierarchy** and choose **Create Empty**
2. **Rename** it **GameManager**
3. Find the **GameManager** script in the **Scripts/Managers** folder
4. **Drag** it onto the **GameManager** GameObject to add it as a component

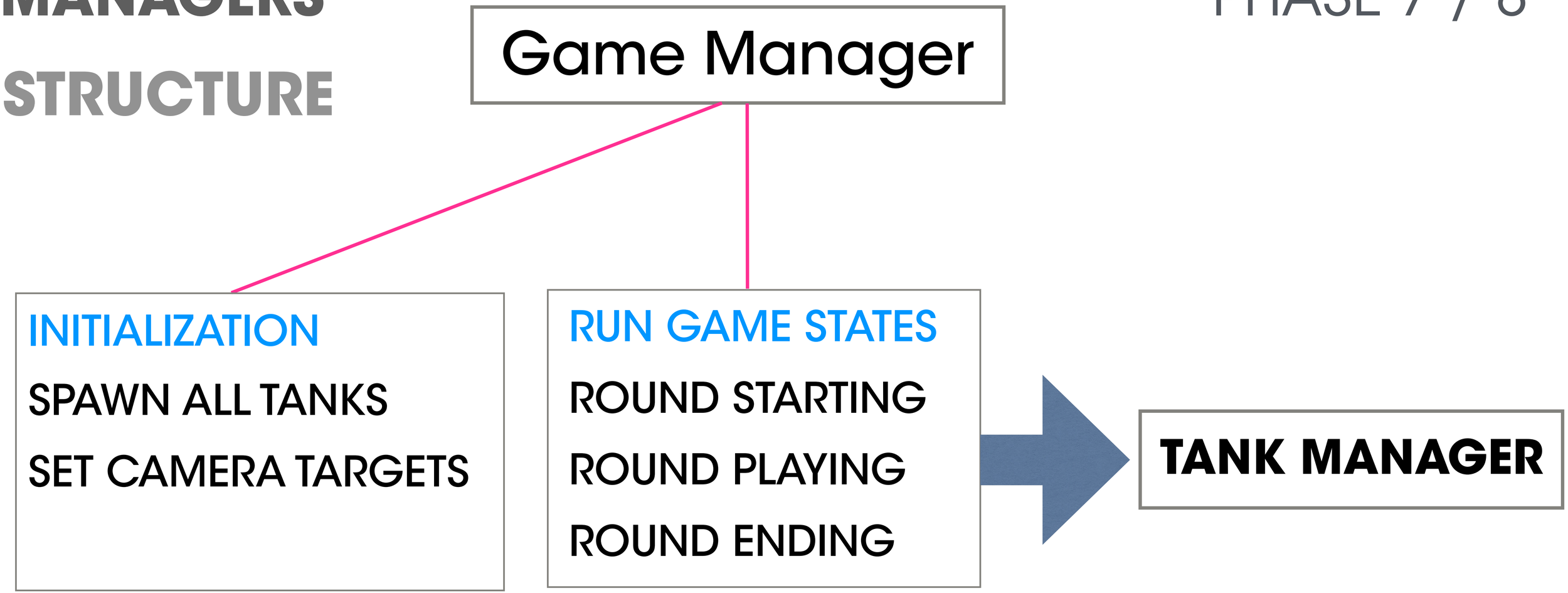
MANAGERS

1. **Drag** the **CameraRig** GameObject from the **Hierarchy** onto the **Camera Control** public variable of the **GameManager** (script) component
2. Expand the **MessageCanvas** GameObject
3. **Drag** the **Text** child GameObject onto the **Message Text** public variable of the Game Manager
4. Find the **Tank** prefab in the **Prefabs** folder and **drag** it onto the **Tank Prefab** public variable

1. Expand the **Tanks** array on the **GameManager** script, set the **Size** to **2**
2. Expand **Element 0,** change the **Player Color** to Blue (**42**, **100**, **178**)
3. **Drag** the **SpawnPoint1** GameObject from the **Hierarchy** onto the **Spawn Point** variable of **Element 0** in the **Tanks** array

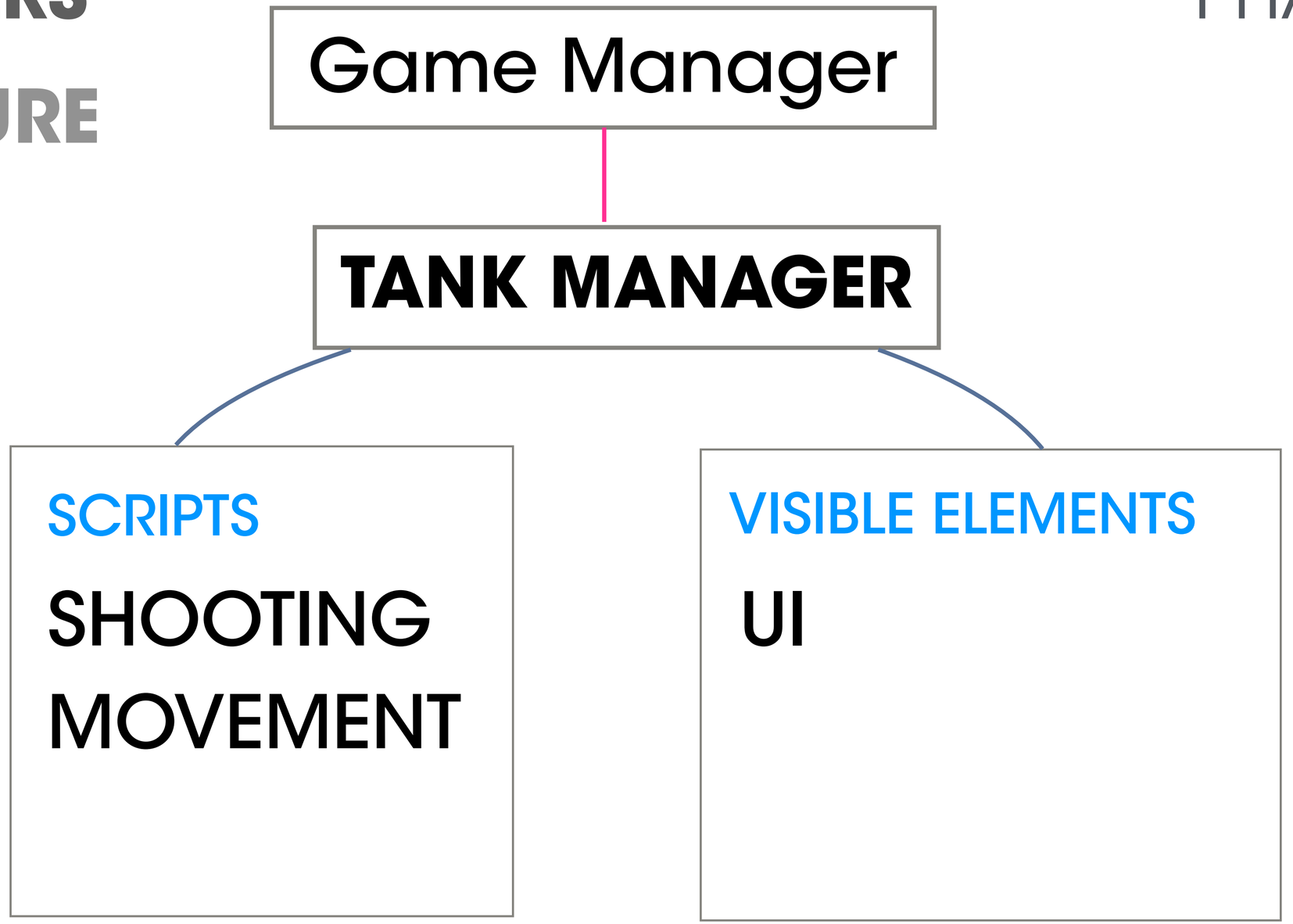
1. Expand **Element 1** and change the **Player Color** to Red (**229**, **46**, **40**)
2. Drag on the **SpawnPoint2** GameObject as the **Spawn Point** of Element 1

MANAGERS STRUCTURE

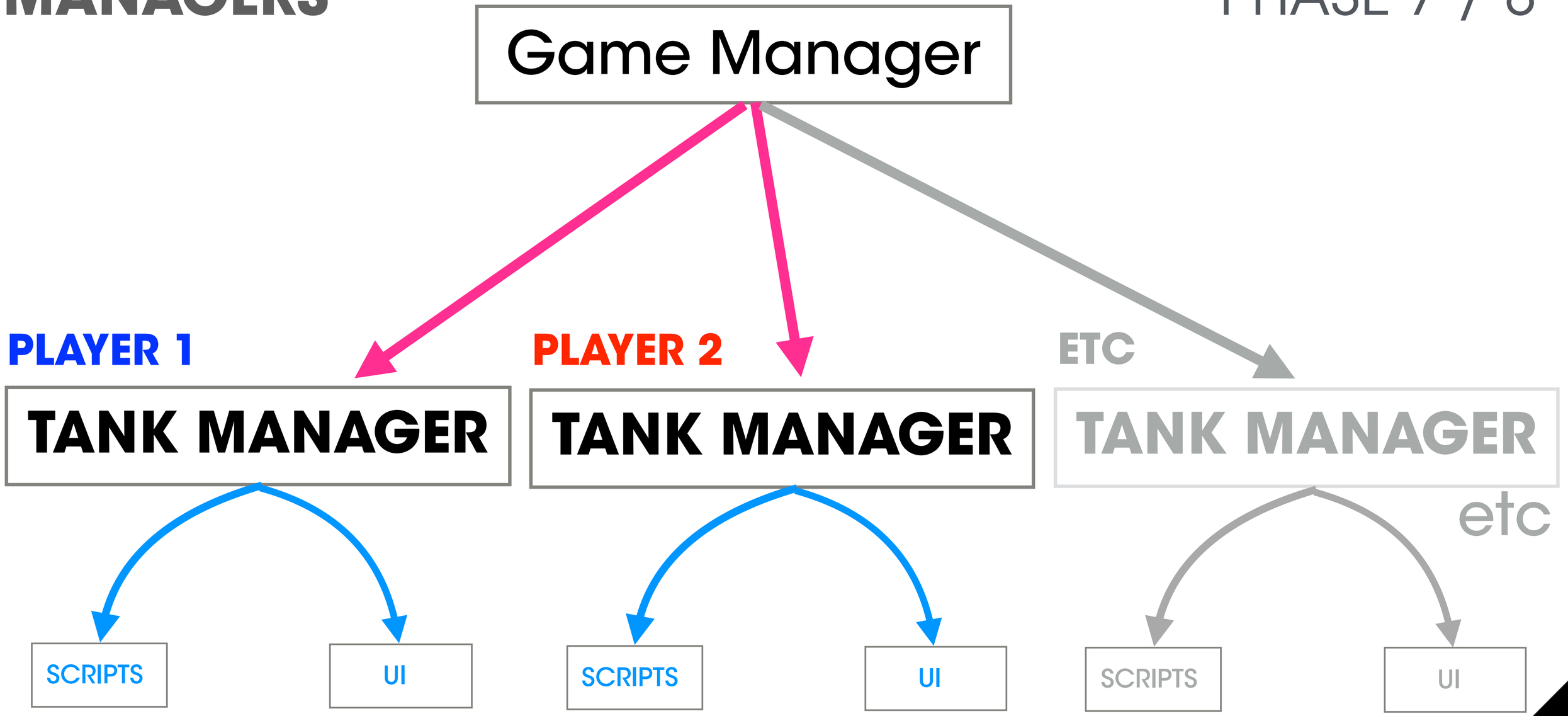


MANAGERS

STRUCTURE



MANAGERS


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

GAME MANAGER

Start()

Use array of **TankManager**s to spawn tanks

Set the **CameraControl** script **Targets** array

Start the **GameLoop()** Coroutine

1. **Double click** the **GameManager** script to **open** it
2. **Double click** the **TankManager** script to **open** it

MANAGERS

GAME MANAGER

GameLoop()

RoundStarting()

wait, then..

RoundPlaying()

wait, then..

RoundEnding()

COROUTINES

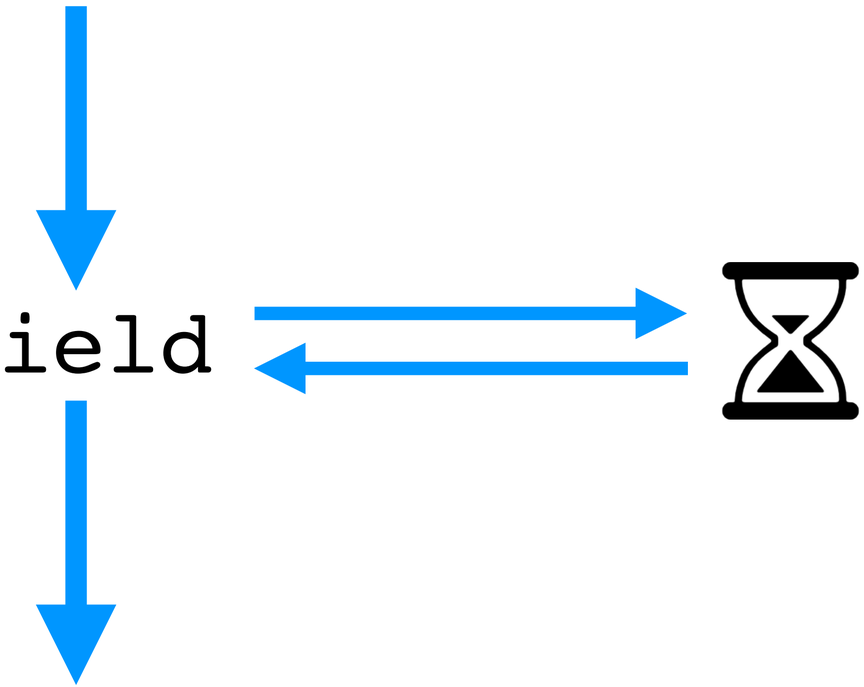
```
void MyFunction()
{



}
```

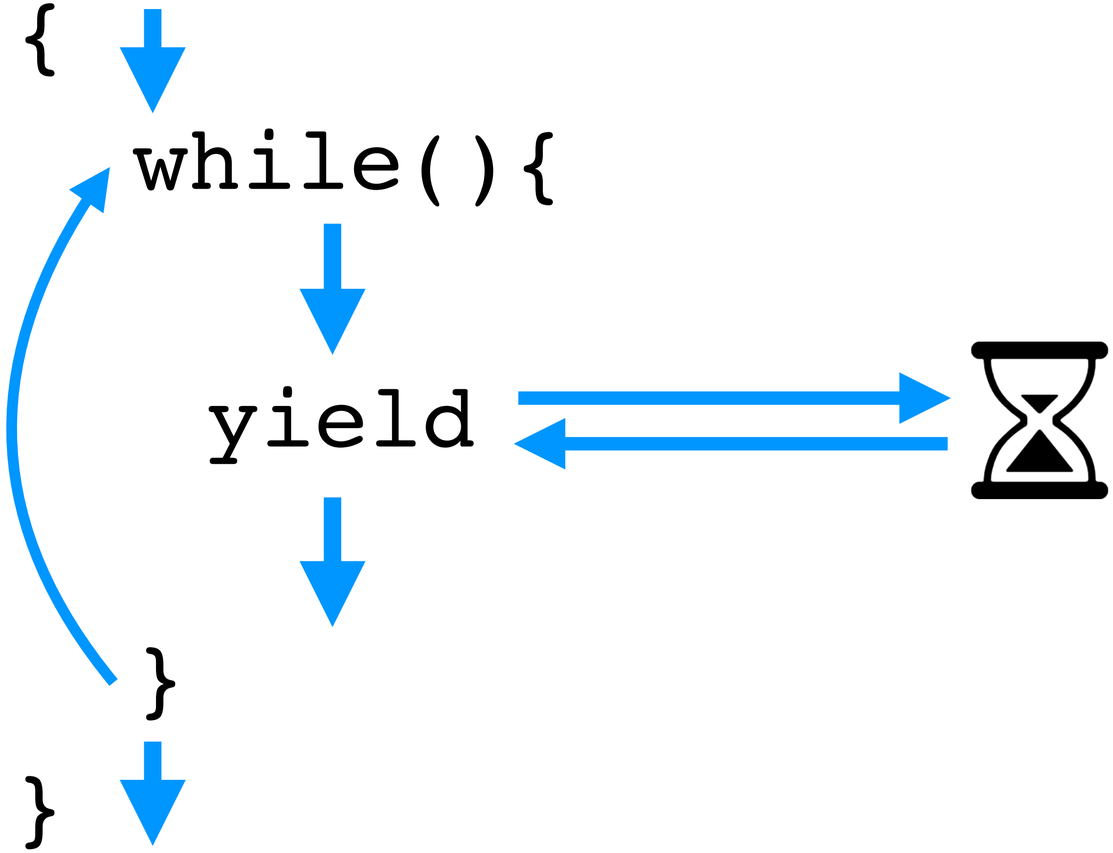
COROUTINES

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



COROUTINES

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



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)

1. **Save** the scene!
2. Grab a neighbour and give it a test!

END OF
PHASE SEVEN

PHASE 7 QUIZ

Which attribute can be placed before a class declaration to make it's properties appear in the Inspector panel?

a) ShowInInspector
b) HideInInspector
c) Serializable
d) ShowInfo

What type is commonly returned by a function that will be used as a co-routine?

a) IEnumerator
b) IEnumerable
c) void
d) Interface

What component does the UI system to display text?

a) String b) Message c) Text d) WordRenderer

PHASE 7 QUIZ

Which attribute can be placed before a class declaration to make it's properties appear in the Inspector panel?

a) ShowInInspector
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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**

1. **Right click** on the empty **AudioMixers** folder and choose **Create > Audio Mixer**
2. **Rename** it **MainMix**
3. Go to **Window > Audio Mixer**

1. Use the **+ icon** above the **Groups** hierarchy to add a child of the **Master** group
2. **Name** the new group **Music**
3. **Reselect** the **Master** group and **create another group** as its child
4. **Rename** this group **SFX**

1. **Reselect** the **Master** group and **create a third child** group
2. **Rename** the last group **Driving**
3. Make sure they are all children of the **Master** group

1. **Select** the **Tank** prefab in the **Prefabs** folder
2. For the **First Audio Source** use the **circle-select** button to set its **Output** to the **Driving** group of the **MainMix** audio mixer
3. For the **Second Audio Source** use the **circle-select** to set its **Output** to the **SFX** group of the **MainMix** audio mixer

1. Find the **Shell** prefab in the **Prefabs** folder.

   Expand it so that you can see its children.
2. **Select** the **ShellExplosion** child
3. Set the **Output** for the **AudioSource** on the

   ShellExplosion child to the **SFX** group of the

   MainMix audio mixer

AUDIO

1. In the **Hierarchy select** the **GameManager** GameObject
2. Set the **Output** for the **Audio Source** to the **Music** group of the **MainMix** audio mixer
3. Select the **TankExplosion** prefab in the Project, set its **Audio Source** output to the **SFX** group of the **MainMix** audio mixer

1. Return to the **Audio Mixer Window**
2. Make sure you have **MainMix** selected
3. **Select** the **Music** group of **MainMix**
4. Set its **Attenuation** to **-12** using the fader
5. **Select** the **Driving** group of **MainMix**
6. Change its **Attenuation** to **-25**

1. **Reselect** the **Music** group
2. In the **Inspector click** the **Add Effect** button and choose **Duck Volume**

1. **Select** the **SFX** group
2. **Click** the **Add Effect** button and choose **Send** effect
3. For the **Send** effect set **Receive** to **Music\Duck Volume**
4. Change the **Send Level** to **0db** (full)

1. **Reselect** the **Music** group
2. For the **Duck Volume** effect change the **Threshold** to **-46**
3. Change the **Ratio** to **250**
4. Change the **Attack Time** to **0**

1. **Save** the scene!
2. Your game is complete! It's Play Time!

PHASE 8 QUIZ

What is the name of the window to display the flow of Audio signals?
a) Signal b) Audio Source c) Audio Mixer d) Funkatron

What does the ducking audio effect do?
a) pauses and plays audio sources based on pitch
b) lower the attenuation of an audio group based on the attenuation of another
c) it is used to send messages to custom components based on the time of a clip
d) it is used as a trigger for the anatidae effect

How awesome have you all been today?
a) alright I guess
b) not bad
c) pretty, pretty good
d) very

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CONGRATS
YOU DID IT!

CREDITS

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