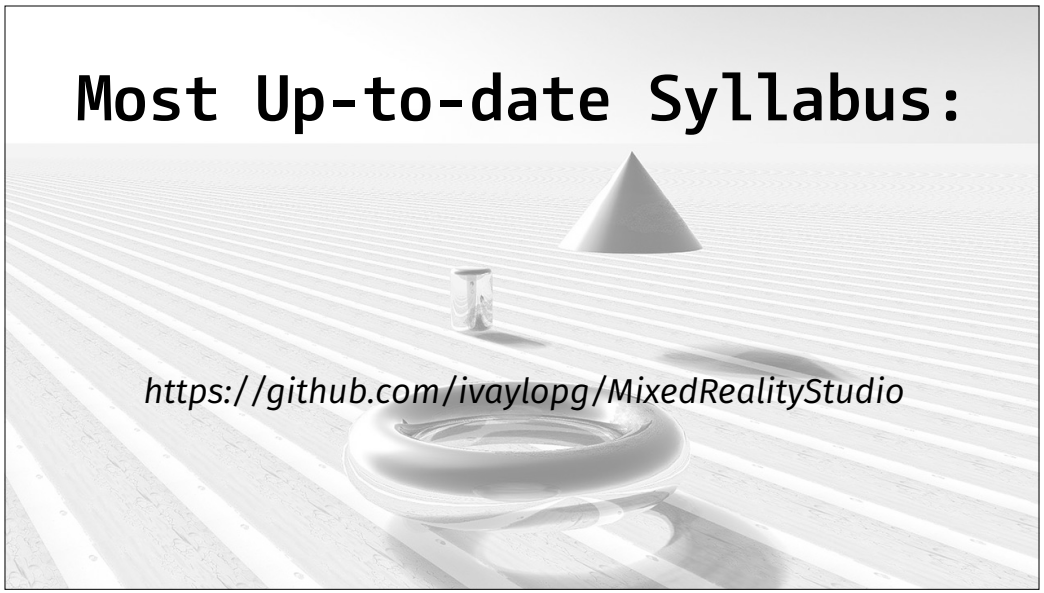
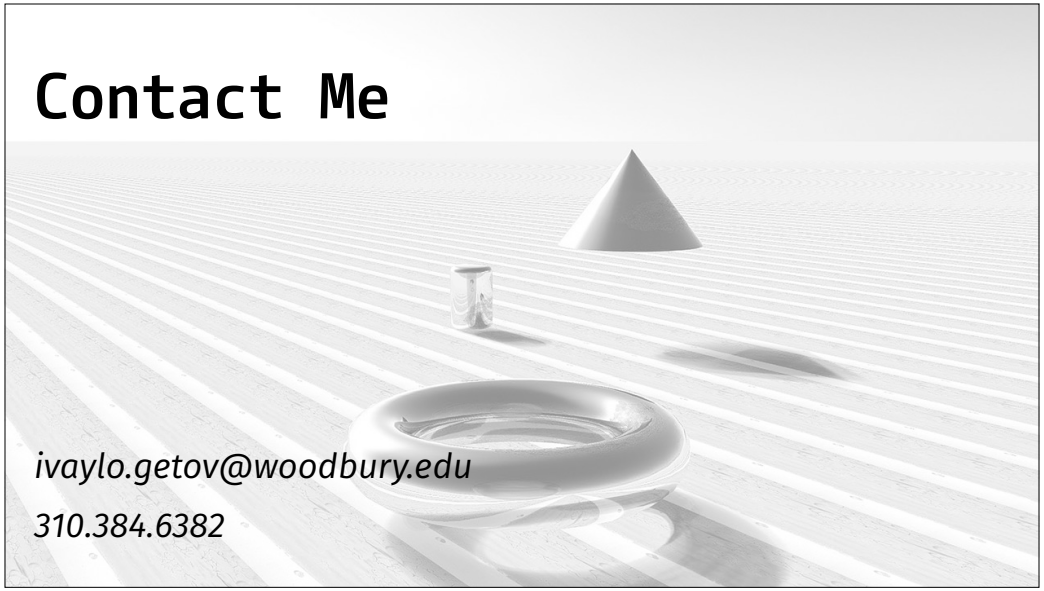

TECH 1711 - Mixed Reality Studio



I will do my best to keep the Moodle page updated, but I can promise that most up-to-date class materials will be here:
https://github.com/ivaylopg/MixedRealityStudio

Contact Me



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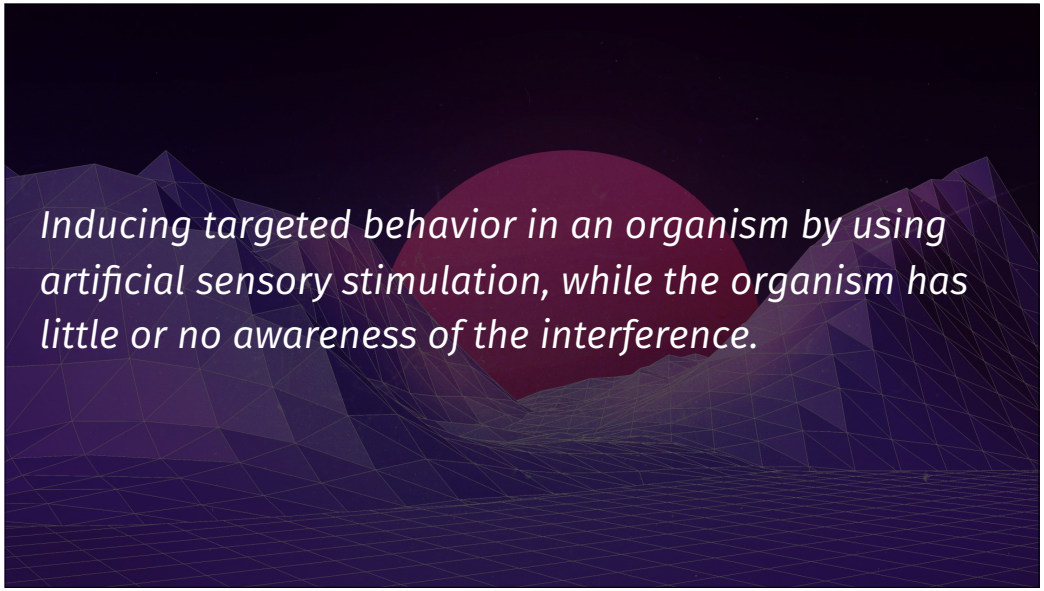
310.384.6382

Recap from last time: what do we mean by Augmented/Virtual/Mixed Reality?



Definition by Steven M. LaValle, Professor, University of Illinois, Chief Scientist of VR/AR/MR at Huawei Technologies Co. Ltd.

Intentionally Broad

Think about this outside of just code: we are emphasizing “behavior” and creating a reality for user’s *experience.*

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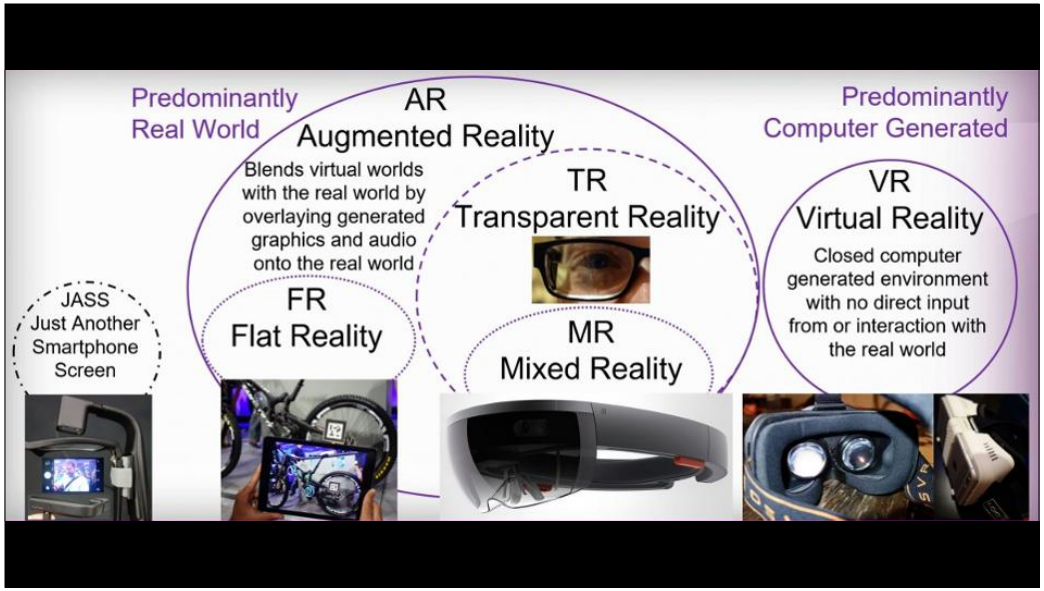


So much out there is marketing term or people trying to be the first to coin phrases.

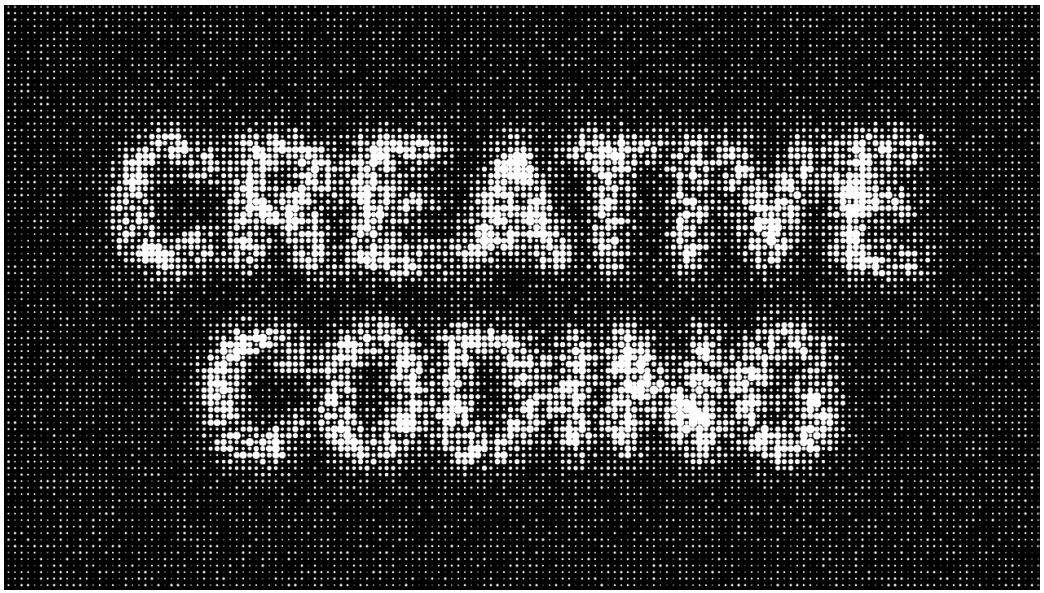
As far as this class is concerned, we're drawing the line here:

VR = everything the user sees/hears is controlled by the experience. It is a world built from the ground up, and you (as the creators) are responsible for creating all the rules of how this world behaves and what the expectations are.

AR = you are *adding* things to the real world. The rules/expectations of the real world still apply, and you can leverage that to your advantage.

What about MR?

"Mixed Reality" is a **type of** Augmented reality, where the physical (ie - the real world) and the virtual can interact and affect each other. More than just an overlay onto your field of view, MR knows what you are looking at.



What is creative coding?

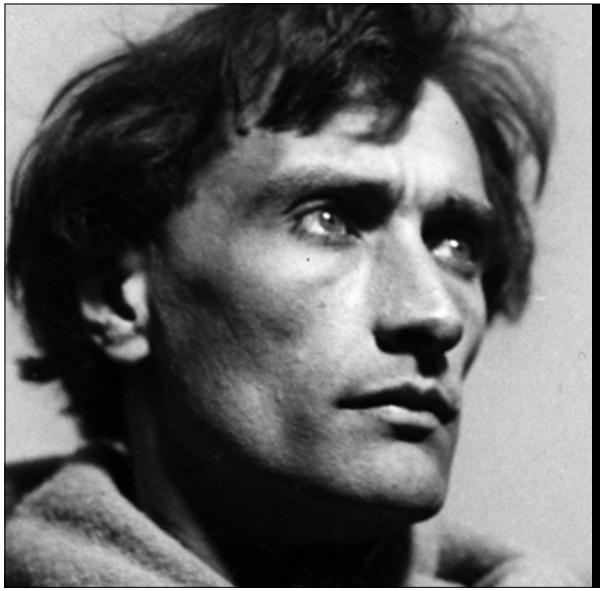
Creative coding is a type of computer programming in which the goal is to create something expressive instead of something functional.

use code to enable/empower/drive our creative and aesthetic projects.

* Coding as writing
* Coding as prototyping quickly instead of planning out the long term

Remember - our definition of MR is about creating realities, not about exporting an .exe or iPhone app

Immanuel Kant - 1781 - Critique of Pure Reason



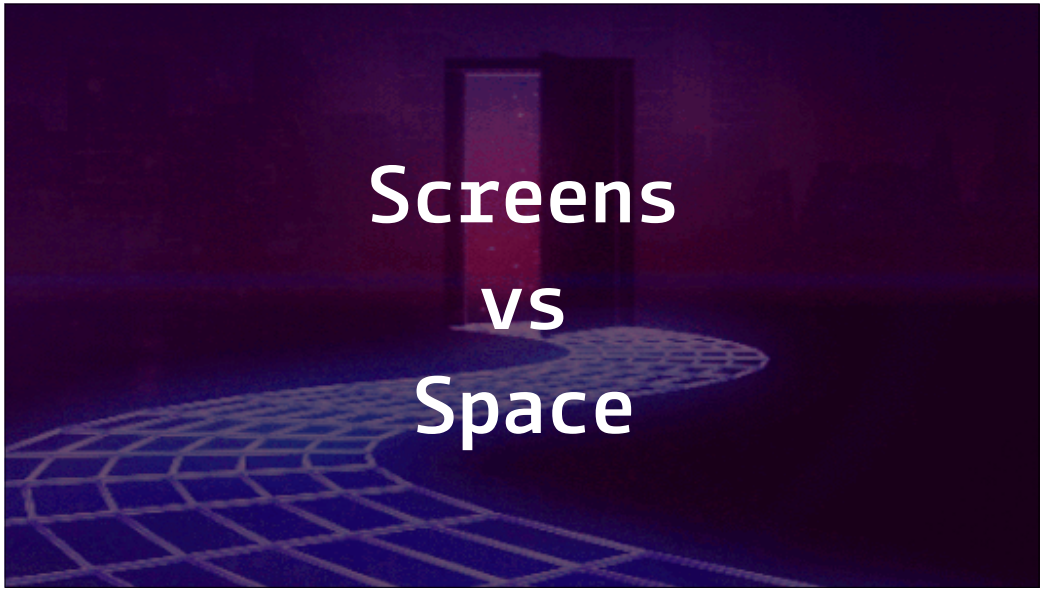
[T]he theater is a mirage.… And the principle of theater… should be understood as the expression of an identity…in which the characters, objects, images, and all that constitutes the virtual reality of the theater develops, and the purely fictitious and illusory world [is] evolved.

Remember - our definition of MR is about creating realities, not about exporting an .exe or iPhone app

Antonin Artaud - The Theatre and Its Double Part III: The Alchemical Theater - 1938.

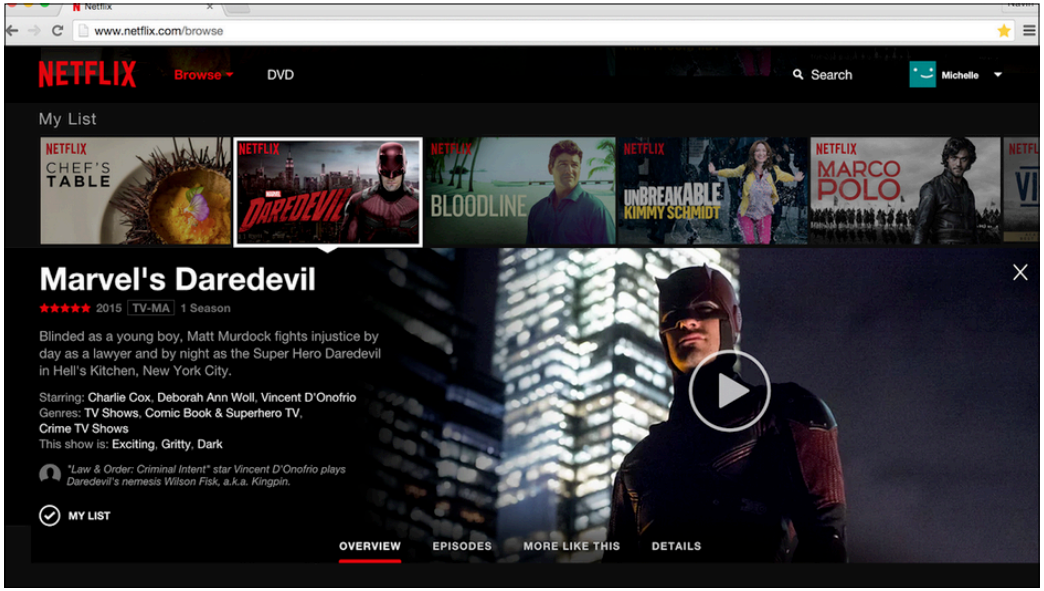
Attack on theatrical convention: opposing the **viewer's sensual experience** vs **theatre as a contrived literary form**

These websites have some great projects for inspiration.



A little more recap:

All of a sudden we have to think about a spatial context for what we make
We are not limited by pixels or the dimensions of a rectangle, but by the available space.

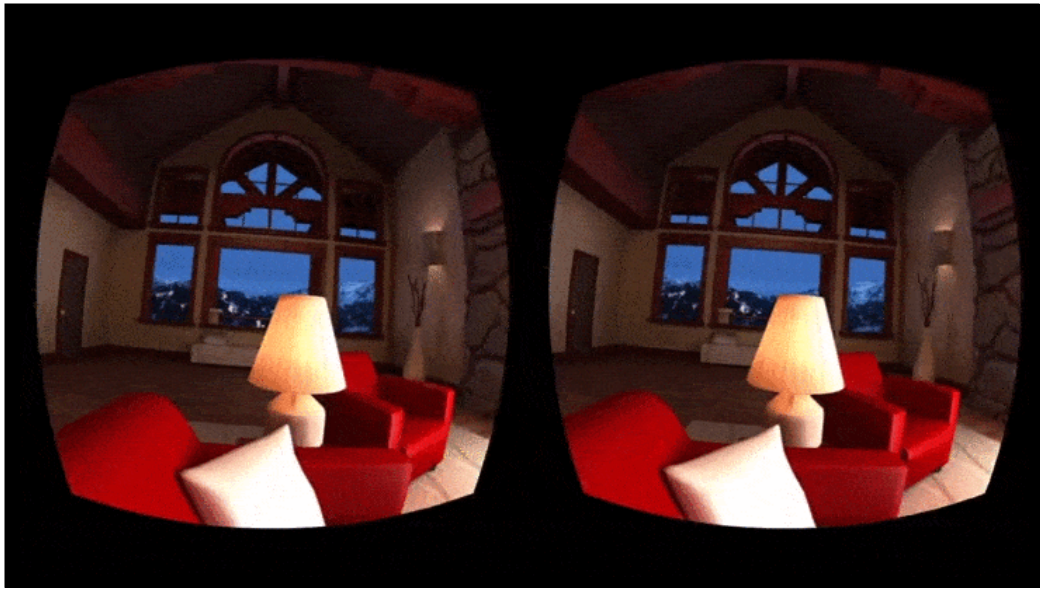


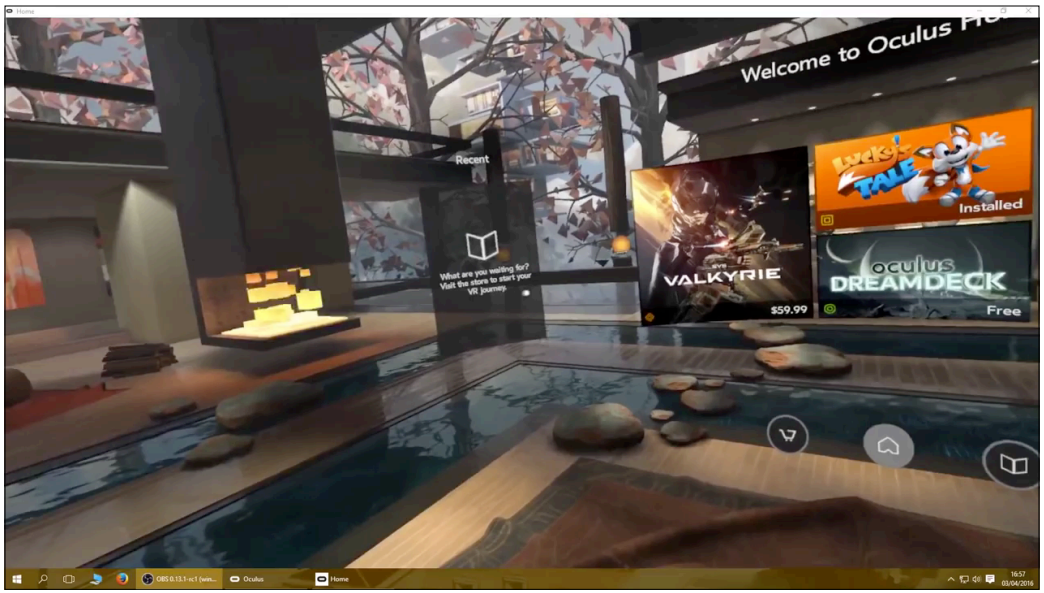
VR - deals with it by creating new environments

Netflix web interface…

..vs Netflix VR interface

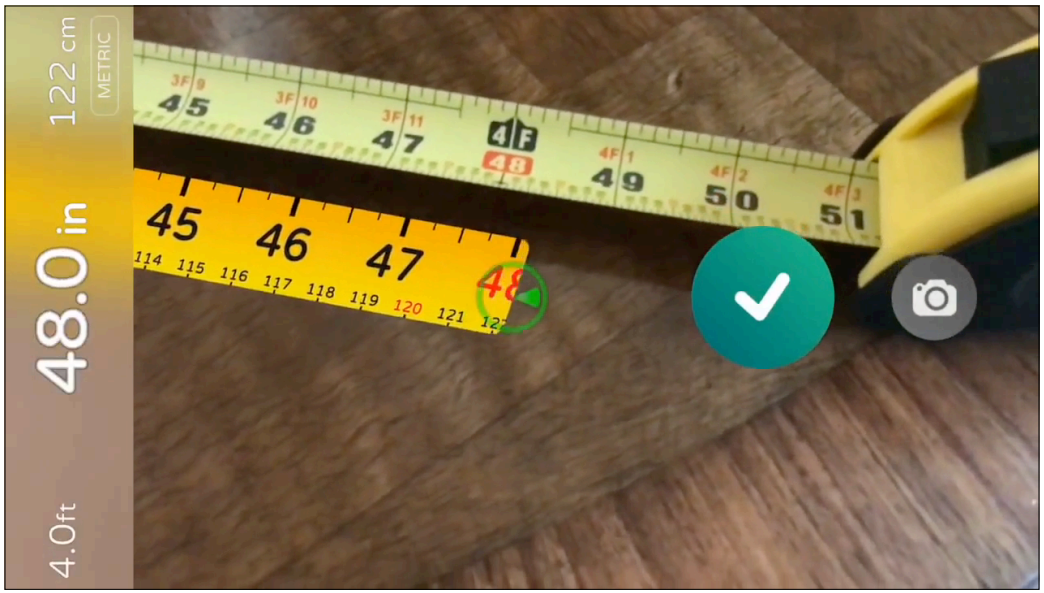
Anticipating a future where we can comfortably sit in VR for a long time, Netflix creates the ideal context in which to watch movies (All of it’s existing content is 2D)





Oculus VR “Home” for your apps instead of a desktop/list.

Biggest criticism was that people couldn’t change this home environment to suit their personality. Oculus changed this at last year’s announcements.



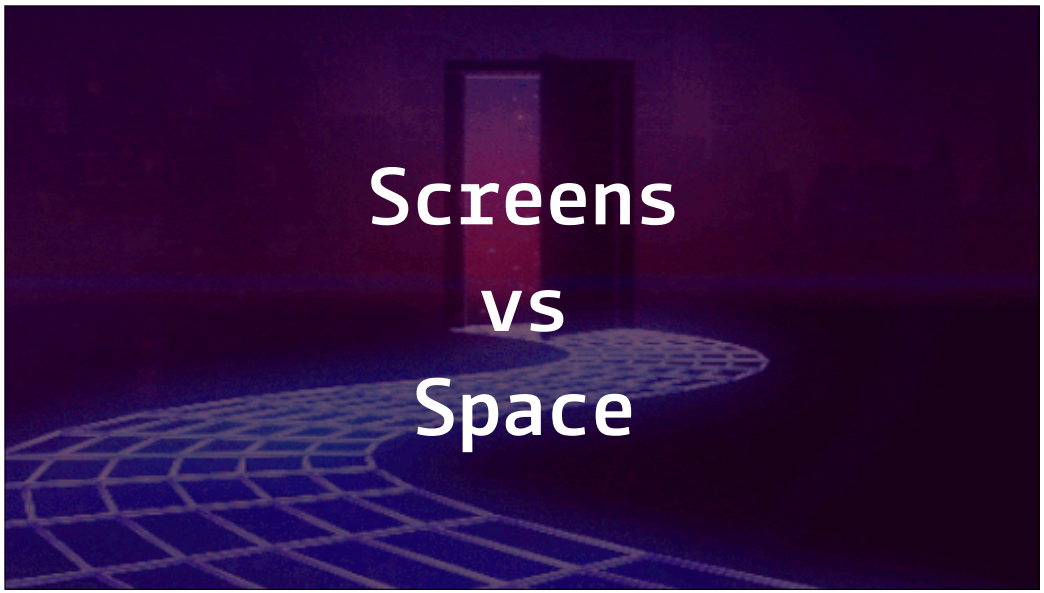
1:1 relationship with real-world scale

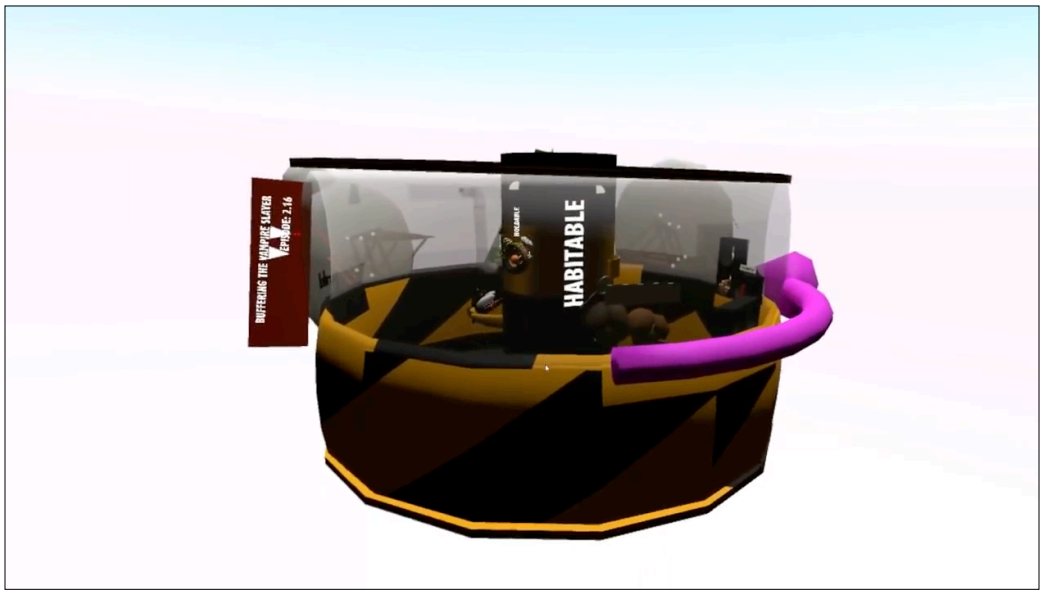
AR apps that can measure the environment

Scale is very important
Real world units


Interaction

Two main concepts to keep coming back to: **Manipulation** and **Exploration**


Screens
vs
Space



M EIFLER, AKA BLINKPOPSHIFT.
http://elevr.com/studio-metaphor-an-embodied-software-paradigm/

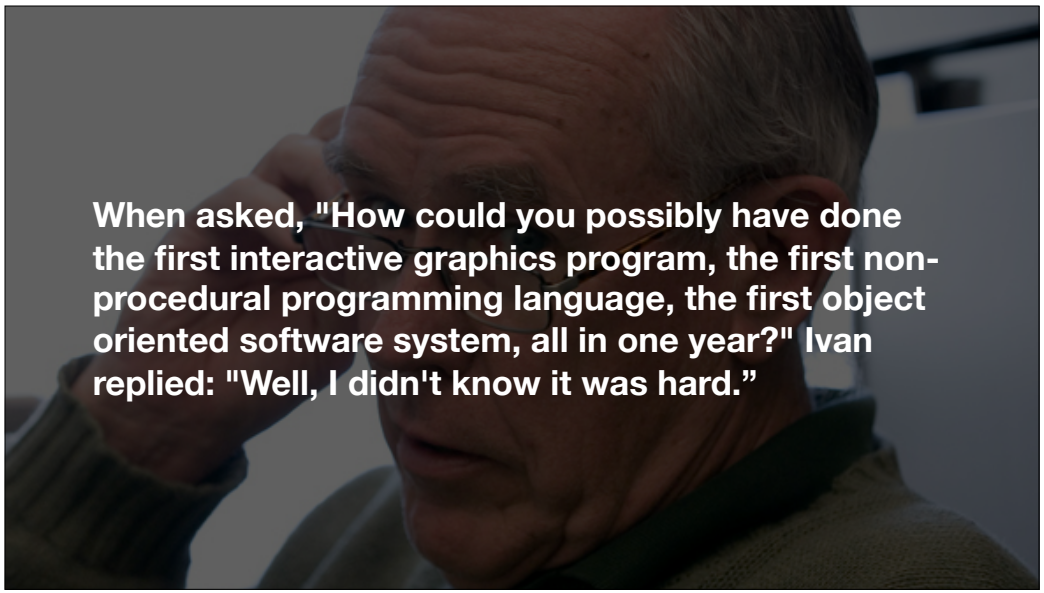
Different scales allow different interactions. Podcast app as a space you can go inside

This relates to something called ***Modality*** - we will explore this in a later session

Modality - A particular mode in which something exists or is experienced or expressed.

(Basically, the ***way*** that you do something.)

Ok! Let’s break up in to groups….



There are often advantages to starting a design process without knowing the technical hurdles ahead of time…

Something Digital you Wish you could touch?

Something big you wish you could see small?

Something small you wish you could see big?

Something invisible you wish you could see?

We’re going to start writing ideas on post-its

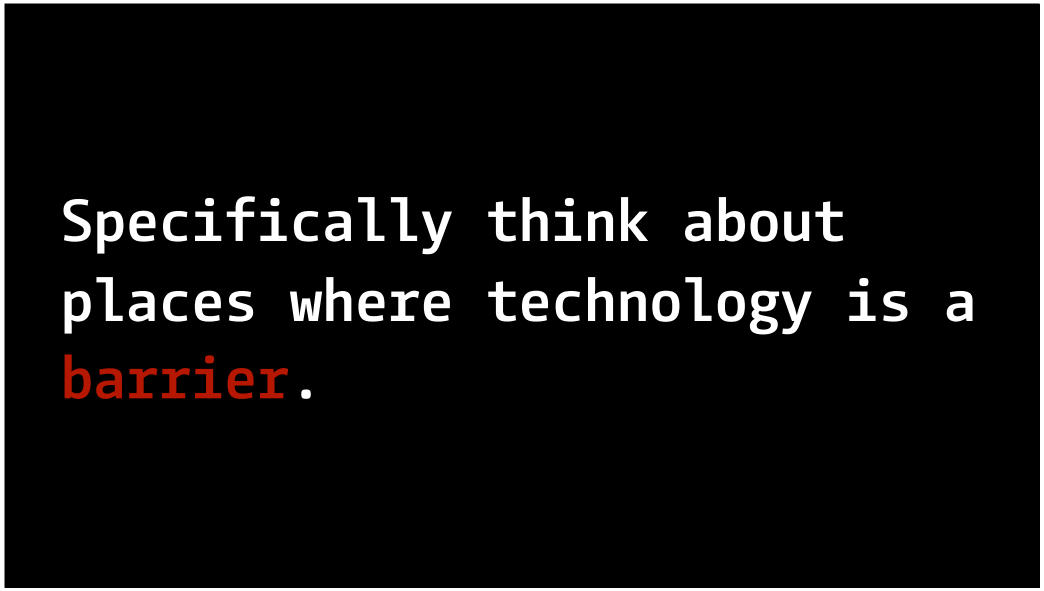
Very high-level. Just a few words will fit (write big so we can see it from far away)

Tool?

Format?

No bad ideas!

It can be a tool, or a ***way of doing/seeing something***.



The exercise isn't how do we make **email** better, it's how do we **replace** email.

Something Digital you Wish you could touch?

Something big you wish you could see small?

Something small you wish you could see big?

Something invisible you wish you could see?

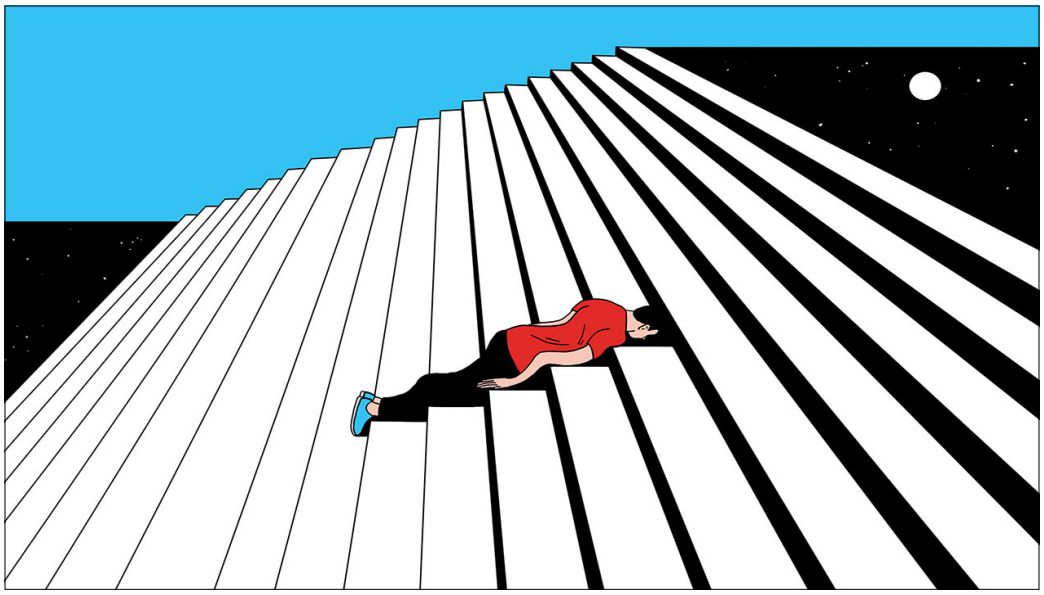
10 mins.
Awkward silence is OK!

Combine Similar Ideas

Separate Complex Ideas

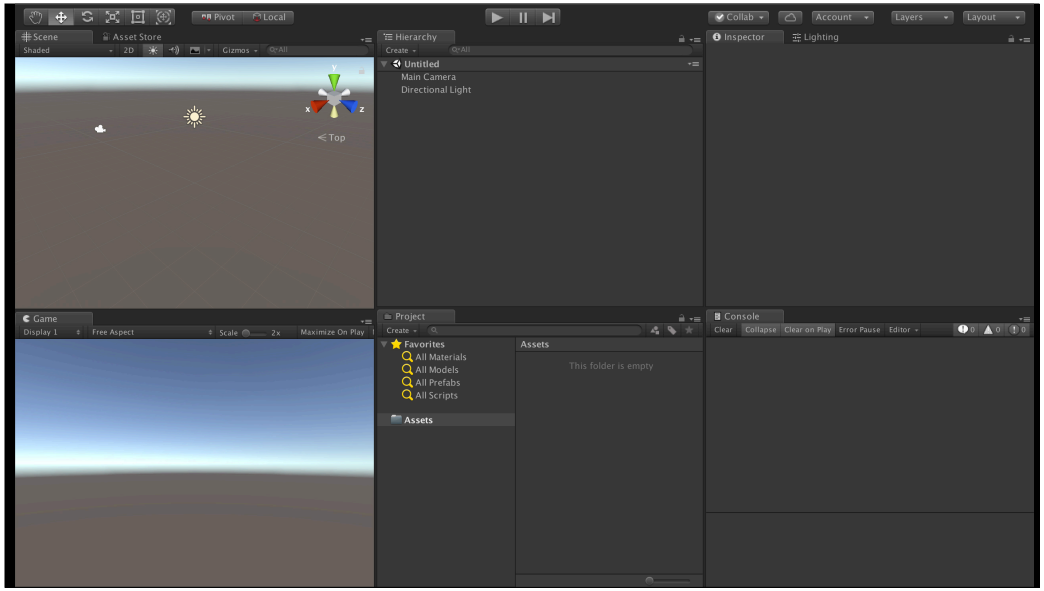
Find Relationships

10 Mins



Ok ok…break time so we can switch gears.

Let’s get in to Unity!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Directional Light
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Lighting
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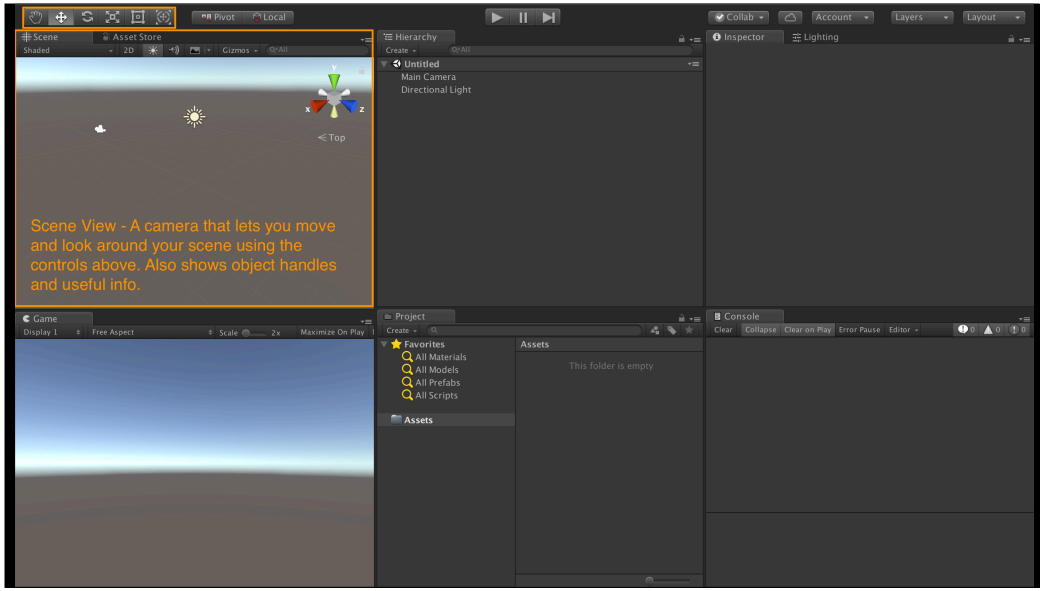
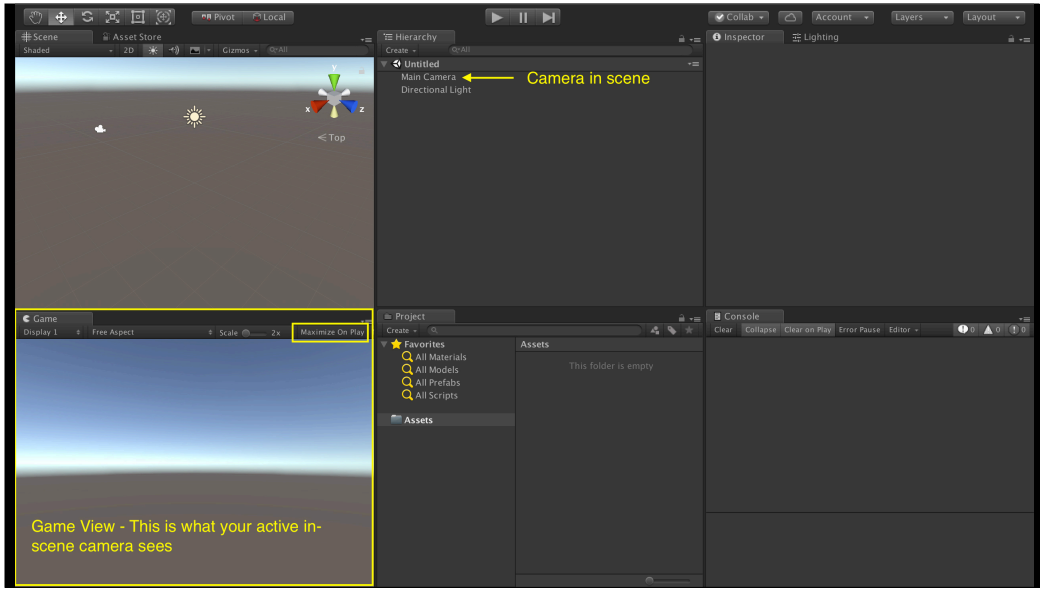
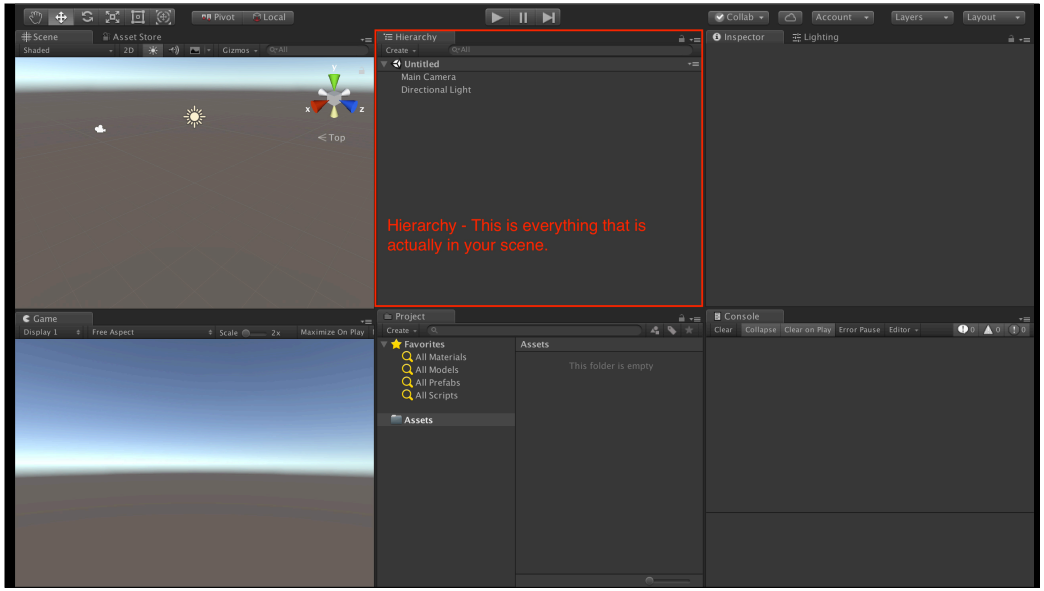


When holding down **Right-Click** inside the scene view, moving mouse along with **W-A-S-D-Q-E** keys will move our point of view.


Camera in scene
Game View - This is what your active in-scene camera sees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Hierarchy - This is everything that is actually in your scene.
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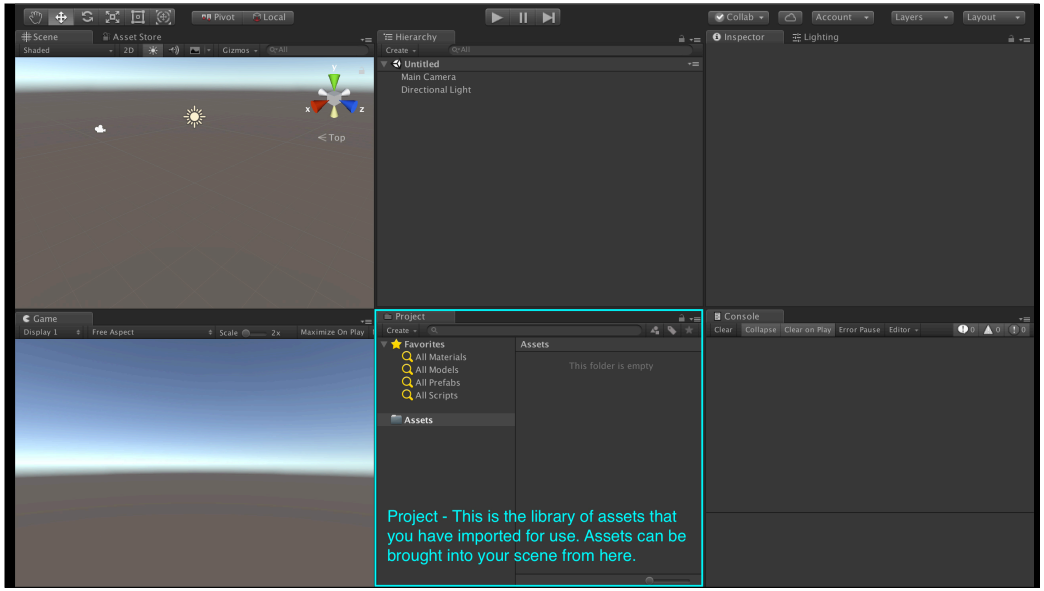
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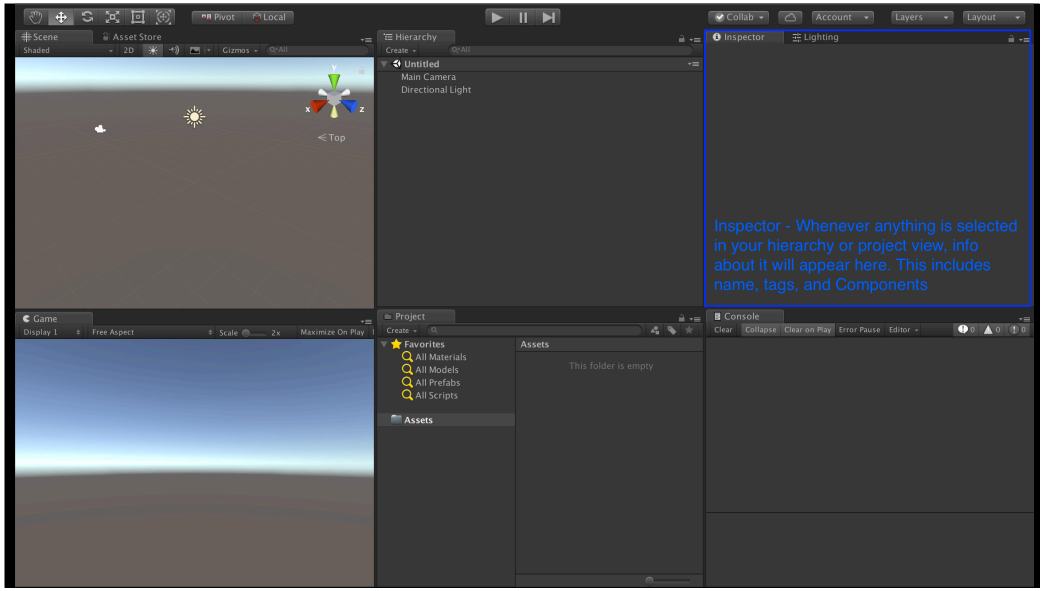
Project - This is the library of assets that you have imported for use. Assets can be brought into your scene from here.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Inspector - Whenever anything is selected in your hierarchy or project view, info about it will appear here. This includes name, tags, and Components
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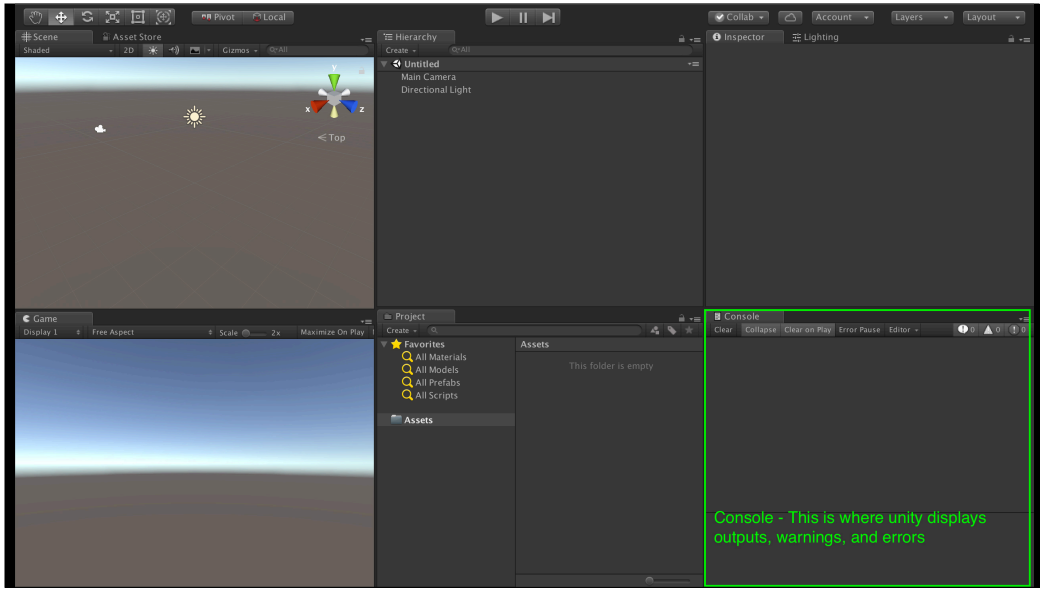
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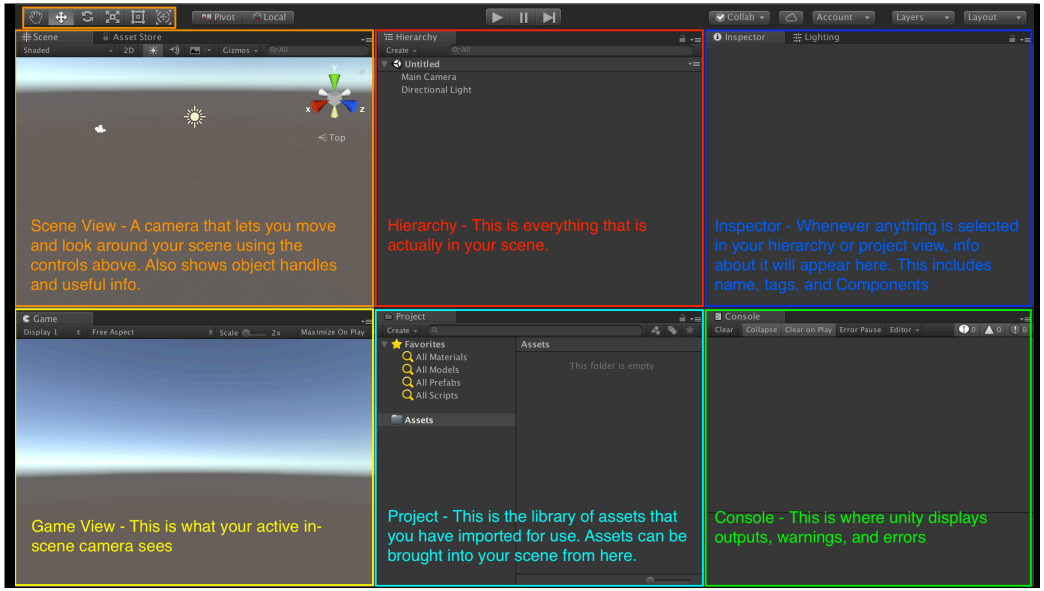
Console - This is where unity displays outputs, warnings, and errors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Scene View - A camera that lets you move and look around your scene using the controls above. Also shows object handles and useful info.
Hierarchy - This is everything that is actually in your scene.
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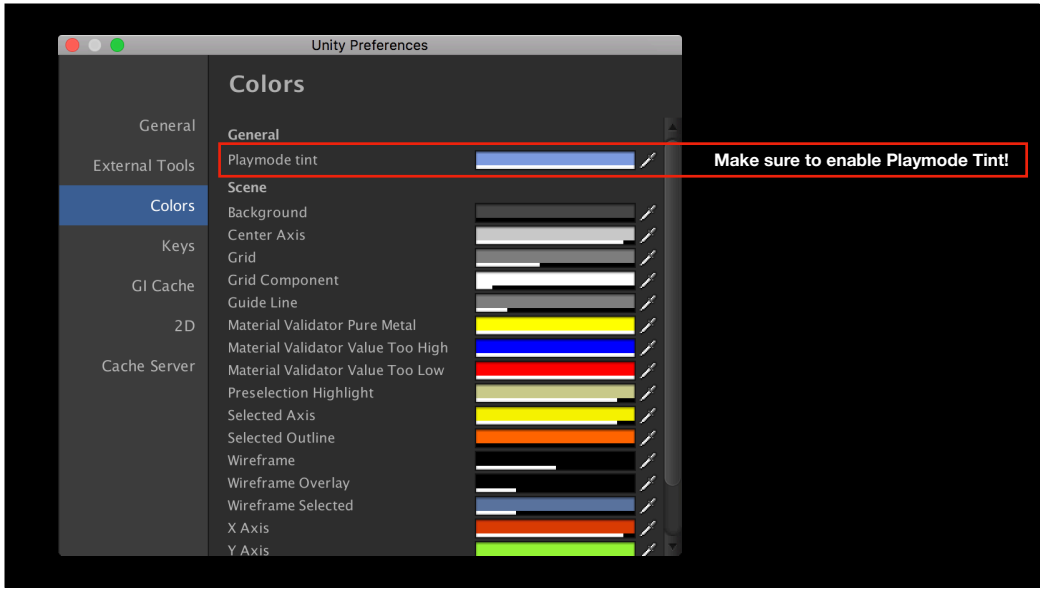
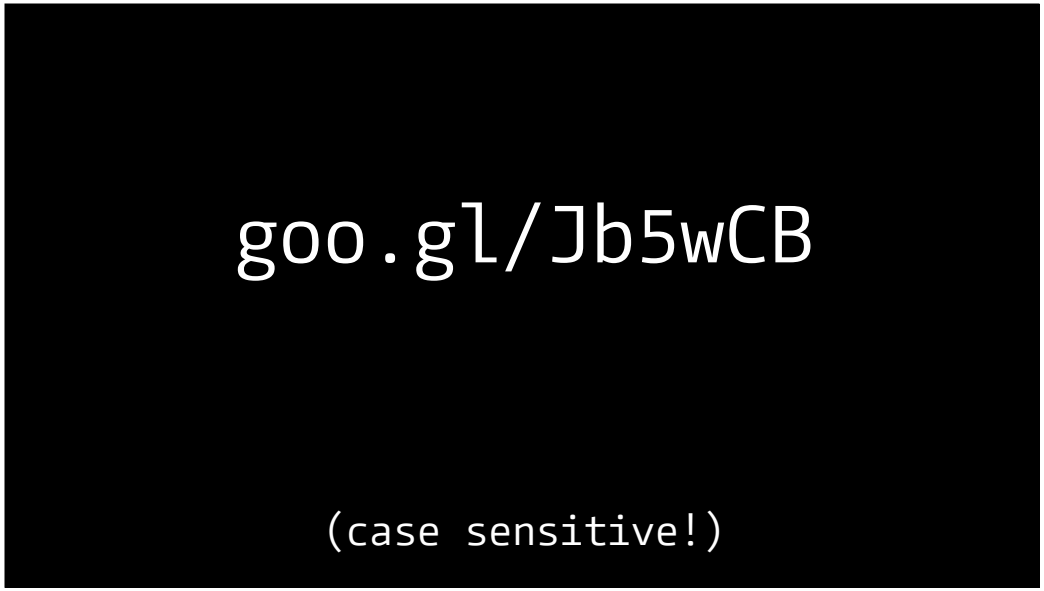


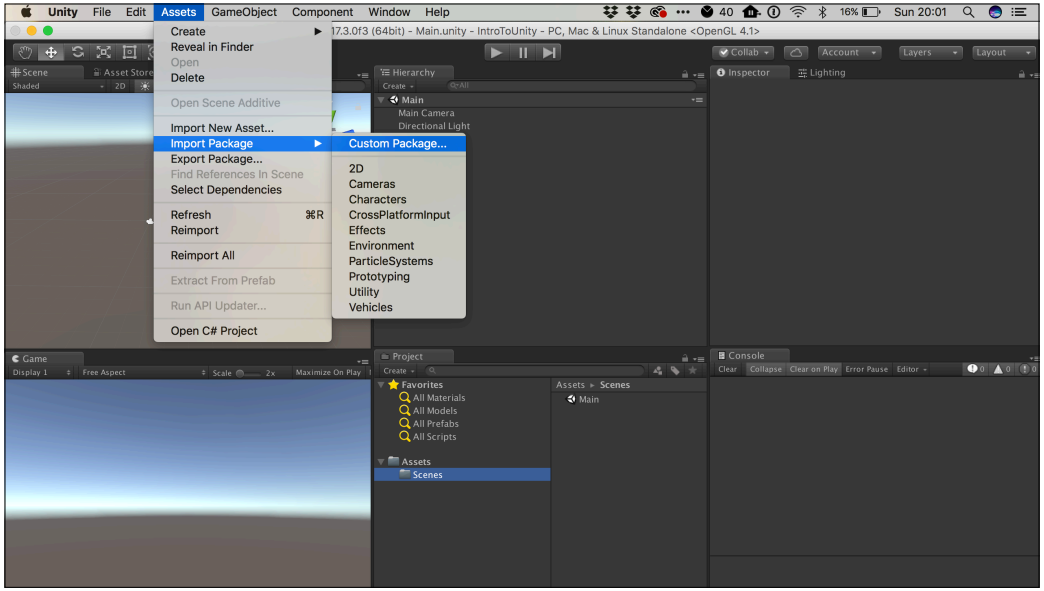
This will save you so much heartache.

(So so much)

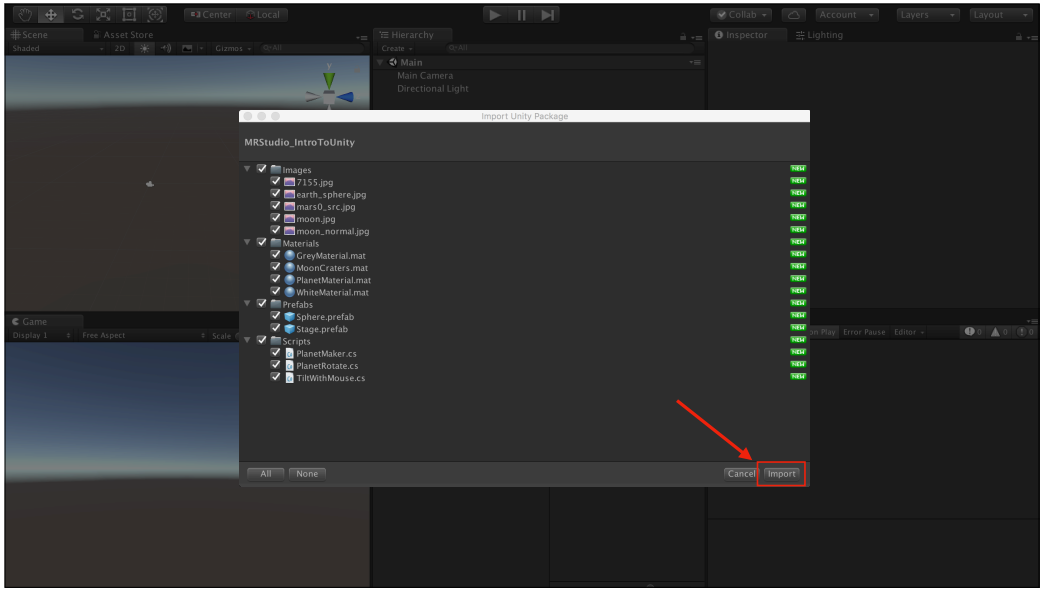


Go here to grab the **Unity Package** we will need today.

https://goo.gl/Jb5wCB



Assets > Import Package > Custom Package…


Import Unity Package
MRStudio_IntroToUnity
Images
7155.jpg
earth_sphere.jpg
mars0_src.jpg
moon.jpg
moon_normal.jpg
Materials
GreyMaterial.mat
MoonCraters.mat
PlanetMaterial.mat
WhiteMaterial.mat
Prefabs
Sphere.prefab
Stage.prefab
Scripts
PlanetMaker.cs
PlanetRotate.cs
TiltWithMouse.cs
All
None
Cancel
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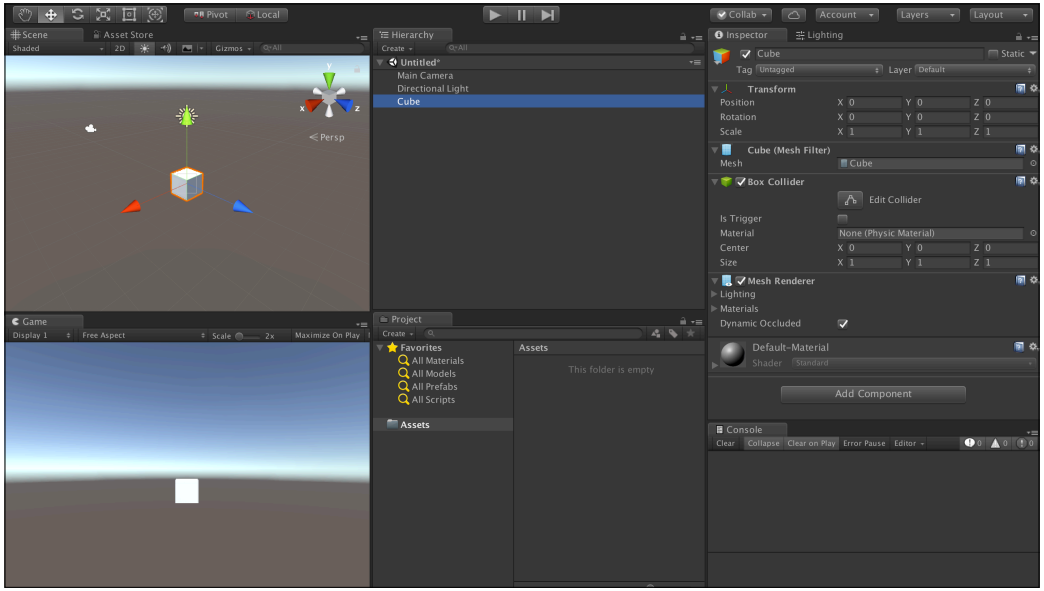
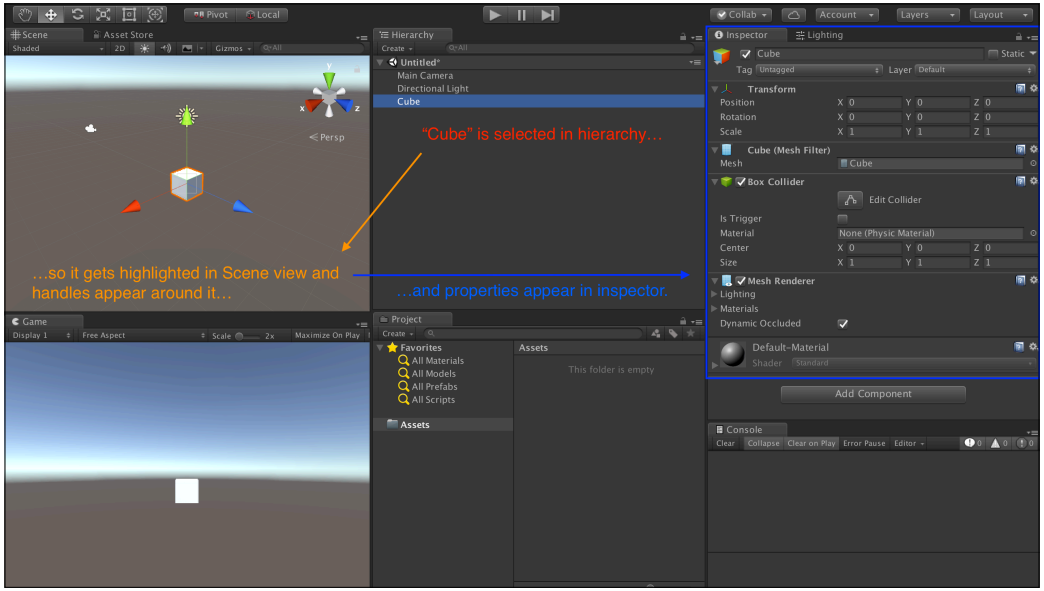


Inspector and **Scene View** change based on what's selected in **Hierarchy**



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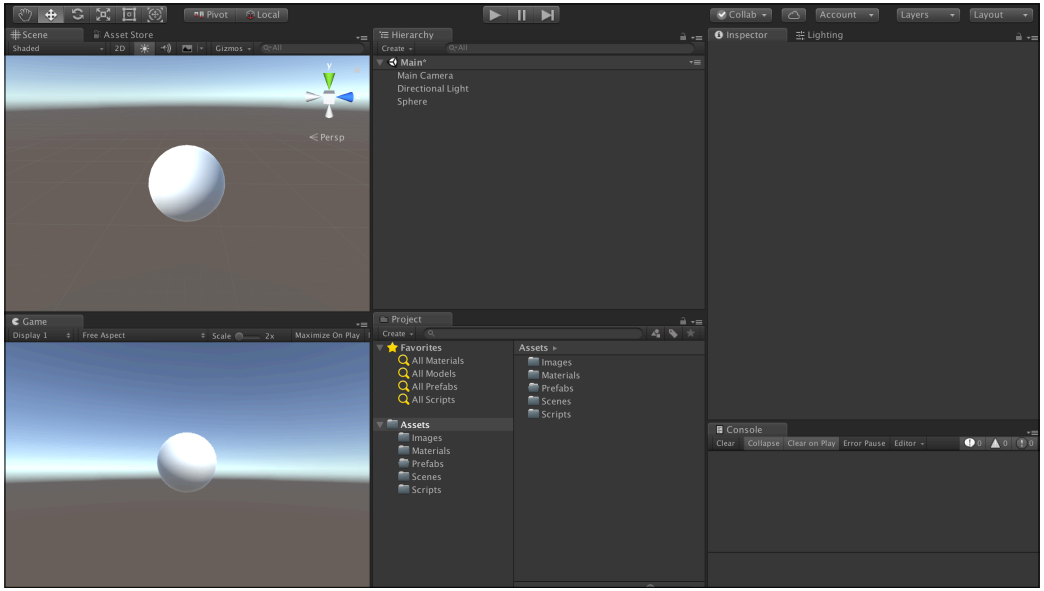
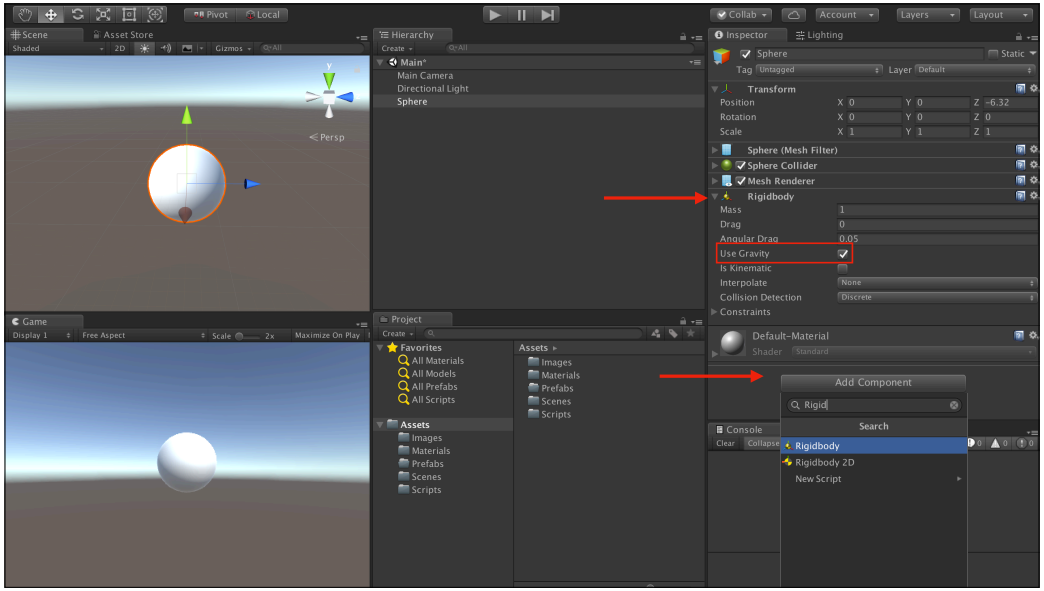


Working with GameObjects, Components, and Prefabs.

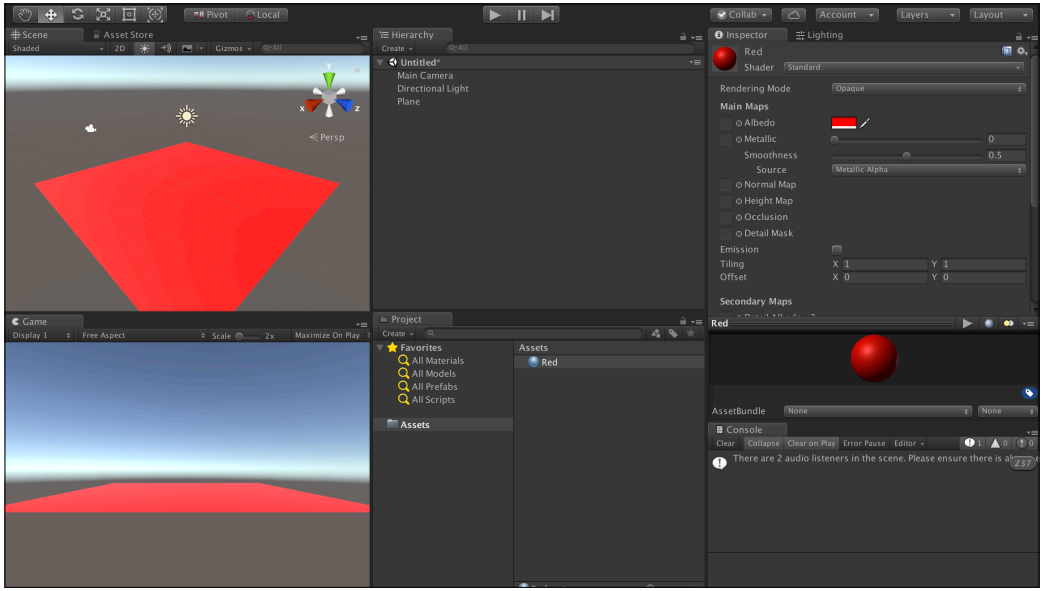
Create a new **Sphere** inside your scene (i.e. create it in the **Hierarchy**)



Back to our **sphere**.

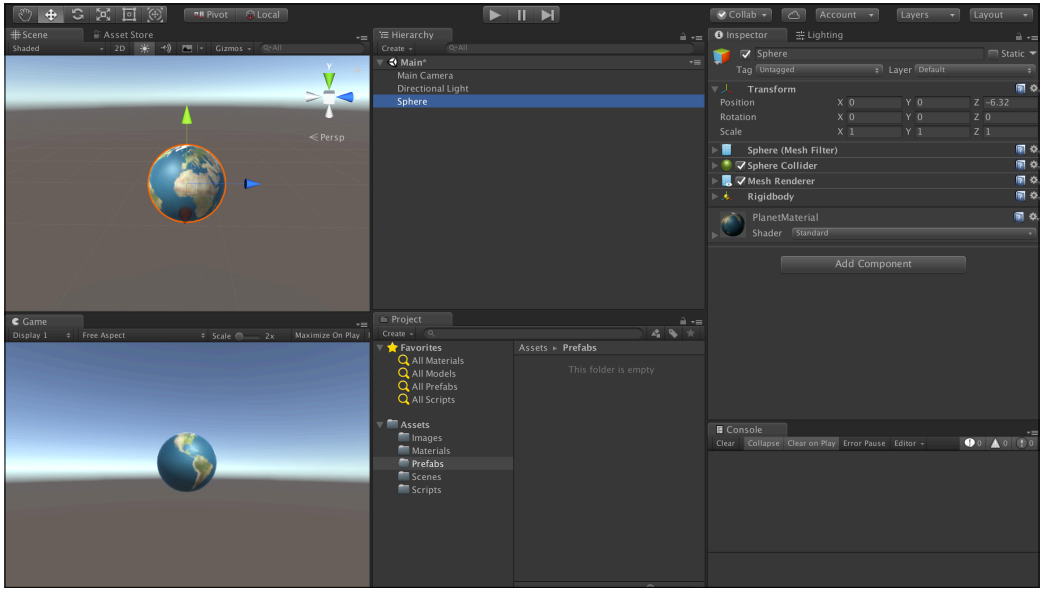
Make sure it is selected and use the “Add Component” button in the inspector to add a **Rigid Body**.

Now you have physics! Yay, thanks Unity!

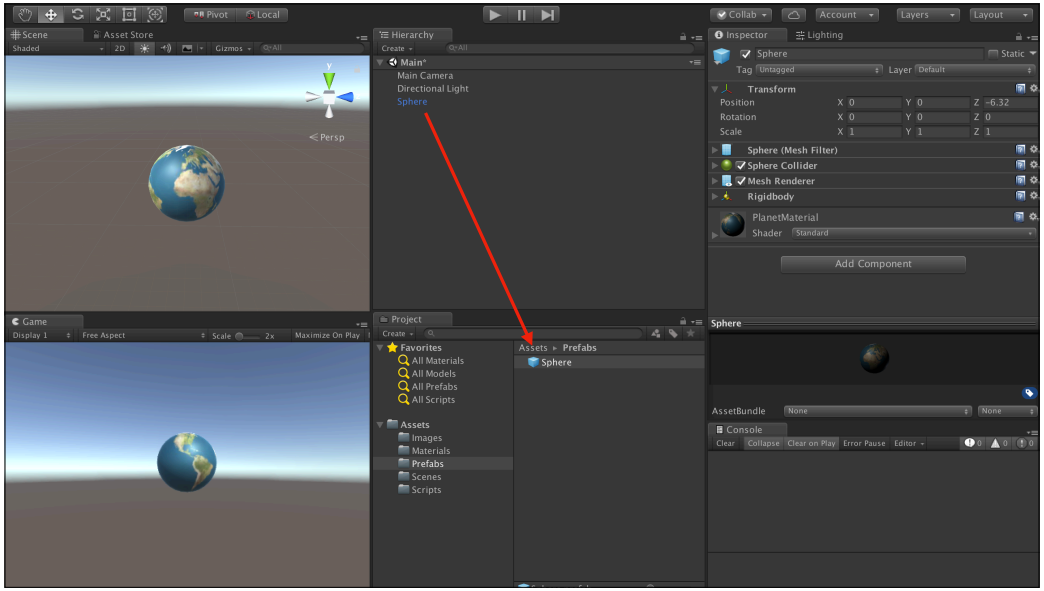


Materials are a bit weird - they’re kind of like a *Component* of a Component

Lots of ways to add them but easiest is by dragging. (This actually works for a lot of components, but materials are clearer: easy to see what you’re adding to, everything else I prefer adding via the inspector, like we did with RigidBody)

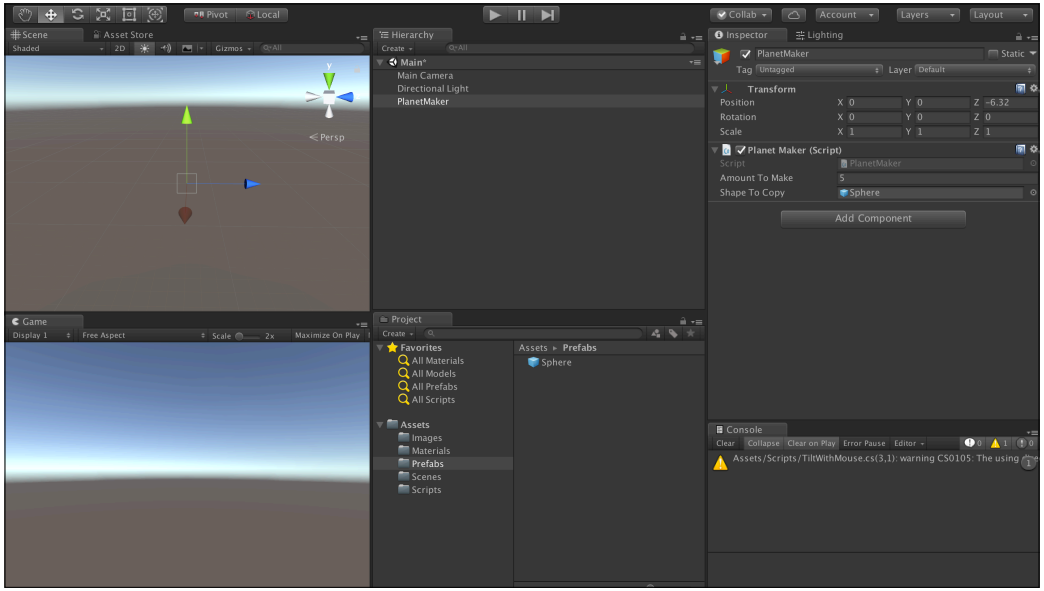


Prefabs! So, we've started with a simple shape, but now we've added stuff to it. Cool textures, useful components.



We can drag things from the hierarchy **back** into the assets in the project view!

This creates a reusable object called a **Prefab.**



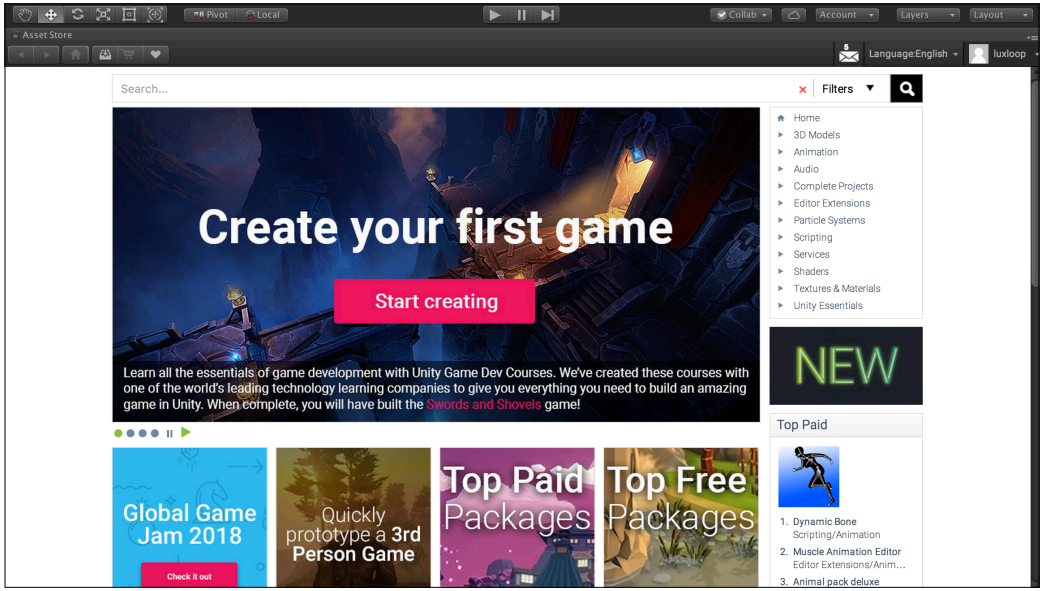
Adding **Scripts** to GameObjects is the same as anything else (We'll cover making our *own* scripts next time)

Scripts have to live somewhere in your Hierarchy (just because they are in the assets does not mean they are active yet).

Create a new **Empty** game object (Just like you created a Sphere) and add the *PlanetMaker* script to it (Just like you added a RigidBody)

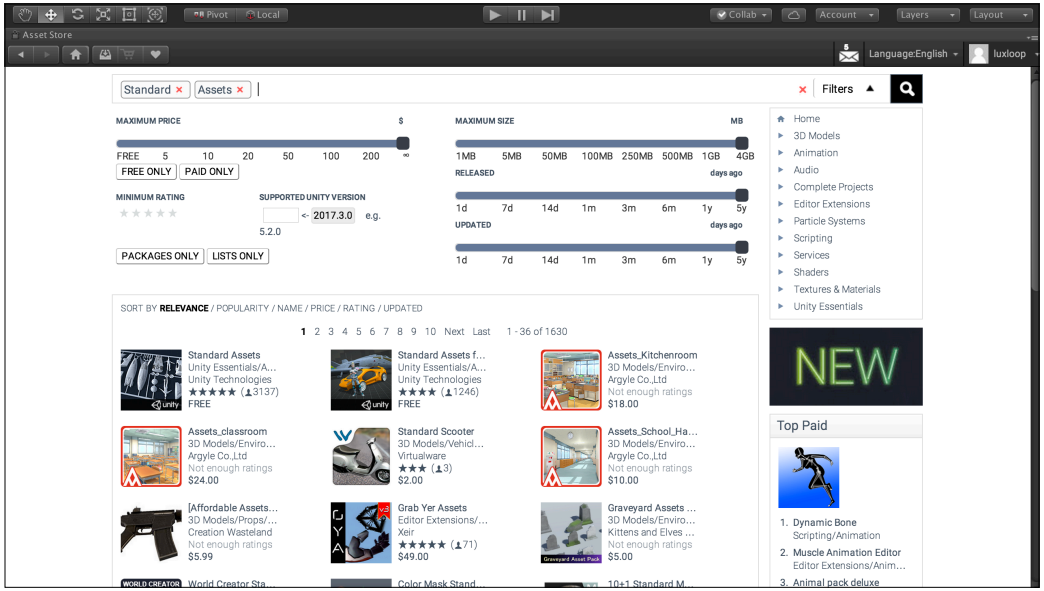
Notice that this particular script has an empty slot in it called "Shape to Copy" and in parenthesis it's saying that this slot takes a **GameObject**. Drag the **Prefab** we made earlier into this slot.

Also notice the "Amount to Make" slot - this is a **public script variable** (more on that later).

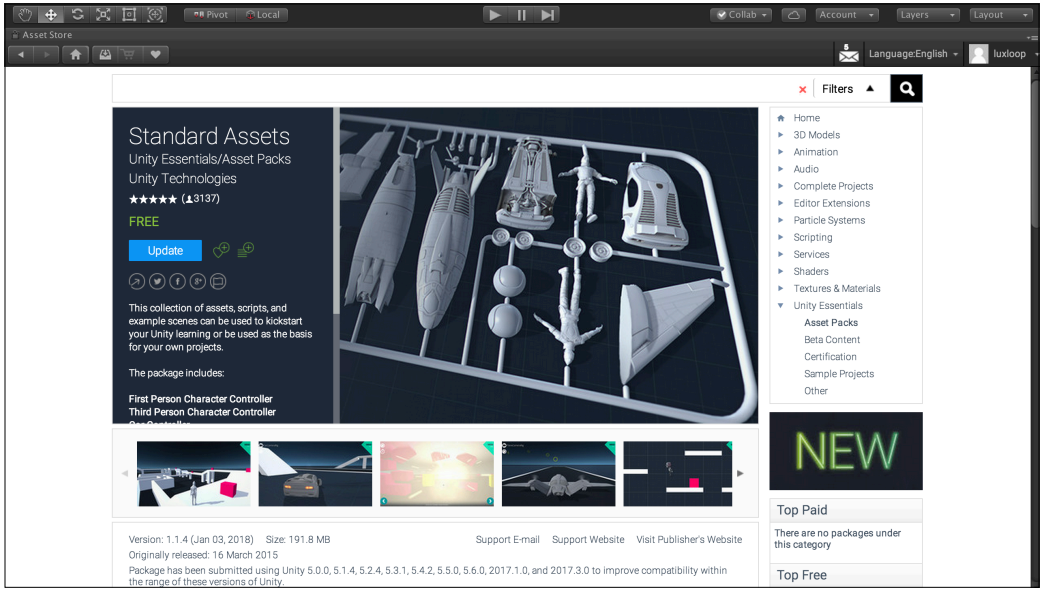


Asset Store

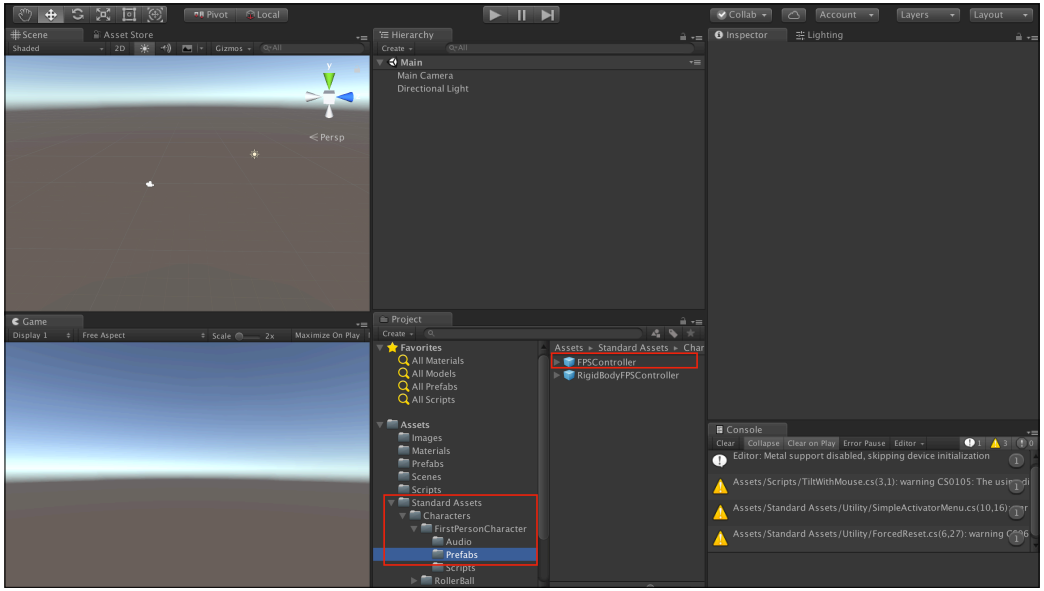
Window > Asset Store



Search for **Standard Assets**



Search for **Standard Assets**



Find the FPS Controller under
Standard Assets > Characters > FirstPersonCharacter > Prefabs

This is the first thing we will use to give ourselves agency inside the scene. Very simple:

- There must be some kind of “floor” for the character to walk on
- The floor must have some sort of **collider** as a component (most Unity primitives already come with collider components

When in play mode, FPSController will move with WASD keys

Finish reading for next time:
http://vr.cs.uiuc.edu/

Reading/watching assignment:

https://thenextweb.com/media/2015/08/31/a-stark-future/

https://medium.com/swlh/the-future-of-design-is-emotional-5789ccde17aa

Thank you!