BEN BISARES: So let's get started in a few minutes. One thing that I just want to mention before we begin, so we're going to be taking a look at a lot of stuff. And so I highly recommend-- no, you don't need to do it right now. But what I highly recommend is-- give me one second-- that you download and take a look at the provided material for this class, which-- sorry, let me make this easier for me to see.

OK so the material for this class is essentially a cheat sheet. It's not a summary of what I'm showing for the presentation today. So a lot of it contains some of the details on the things that I'm going to show you. OK, so if I go quickly through something and you missed, OK, where exactly did he go in the menu, don't worry, OK? Really, what I want you guys to take from today is more of, not how exactly we did what we did, but more of why we're doing what we're doing, OK?

So like I said, this sheet here, it's 18 pages or so. It's basically the details of all the things that I'm doing. It's in no particular-- well it's in a slightly logical way. But yes, I mean, this contains all the information of what we're going to see today. OK, so not needed for right now. But definitely, if you want to understand what's going on, you will need it at some point in time.

OK, all right, so good morning everyone. So my name is Ben Bisares. I'm basically the Media Entertainment Specialist at Autodesk. In addition to that, I have a role as a division manager for the Media and Entertainment Industry. Basically, just to summarize over the part that's important for you, it's my job to connect all the people that work in Autodesk with you, OK? So if you have any questions, comments, things of that nature, feel free to tell me what they are. OK, not right now, but we can go talk about it after the class. If you see me around the AU, I'll be here for today. Don't be shy to stop and have a little chat.

So what we're going to take a look at today is basically the next step in design visualization. OK, now what exactly does that mean? To do that now, I'll just skip over the class summary. You've probably seen that. But to do that basically, we need to see the old school way. So for example, an architect, how did they present their material to potential clients or customers. So what I call the old school way, well, obviously floor plans, blueprints, if you're doing product design. In addition to that, still renders, movies, so rendered movies, and also physical show units. So you would build a little model unit, somewhere close to the construction site, assuming that the project is further along, and your potential customers would come and see

that unit.

So what are the drawbacks? Now, it's still essential that we do things like this. But some of the drawbacks is it can be difficult for the viewer to interpret what they're seeing. I mean, sometimes it's self-explanatory. But a lot of times, I've had customers go what is that. They don't really understand the layout. They don't have a full idea of the size. It's not necessarily their fault. I mean, it's just the nature of the beast. We're taking, essentially, a 3D space and representing it in a 2D fashion, OK? So sometimes it may not be obvious.

Also changes can be costly, not only in terms of money, but in terms of time. I don't know if you guys have had this, but I've had a lot of clients in the past where they don't know exactly what they want. But they know what they don't like. So basically, meetings consisted of me showing things. And they go, yeah, I don't like it. And I'm like, OK, no problem. What do you need to change? And they're like, eh. So they don't really know what they want. So it's basically a lot of back and forth, a lot of time wasted, OK?

And also it's passive and it lacks immersion. OK, so one of the things that we can do with this live design workflow is create VR content, so virtual reality. And I don't know if anyone has tried it. I really wish-- I had this in my mind when I first started. So VR essentially is quite new. So there's two main competitors out there, the HTC Vive, the Oculus, I'll talk about it later. They were just released earlier this year, April, I think, for the HTC Vive. Oculus was a little bit later. So I mean, it's really new. We're really at the beginning of this. But everyone that I've shown it to, everyone they have seen it, it's amazing. It's always the same reaction. It's just this jaw-dropping, like, wow, it's so real. And everyone has the same reaction. And I wish I had the foresight to just record everyone's initial reaction to it and make a montage of it. Because it's amazing.

So yes, so that's the problem, we'll say, with the old school way. With the live design way, what happens is that it allows us to build experiences. OK, no longer is that just something that's passive. We can build something immersive and interactive. We can have the viewer actually go and walk around the space that you've created, interact with the objects, make changes as they see fit, something we couldn't do literally months ago. And it turns complicated-- or sorry, it's the complicated turned on uncomplicated, OK?

So it allows us to represent complex constructions in a simple way. OK, so for example, let's say in back in high school for me, they were trying to teach me how an internal combustion

engine works. And just looking at the diagrams, it's not obvious. But when I saw an actual animated movie, I'm like, OK, it makes much more sense. This is the kind of result that you can have with the live design way, and also just stand out, OK. We all know it's a competitive world. You need every advantage you can get. This is one of them. Good?

OK, so essentially there's two workflows when it comes to the live design ecosystem. I couldn't think of a fancy term for it. So it's just Revit to Live Editor. So what happens is you take your content that's in Revit and we bring it into what's called the Live Editor. And we'll see a demo of this. OK, so if it's not 100% clear at the moment, don't worry about it.

So with this workflow, what are the pros? Essentially, it's very straightforward. It's a one-click operation, practically. OK, also it conserves any of the BIM information that you have in there. So that could be useful for the customer. They want to see exactly what is this material of the wall, floors, what have you. It keeps that intelligence. OK, so that's quite good. The cons, it's not performance optimized, not at this point. OK, I mean, this is all new stuff, which is very exciting. But it's not mature. I mean, I'll admit it. But I mean, we have to start somewhere.

So what I mean by that, it's more in terms of hardware. You can't expect to take your take your dusty, 10-year-old laptop, and go ahead and start working on this, and expect a good performance. Also it can be lacking in eye candy. What I mean by that is that the other method really allows us to add these really fancy bells and whistles that will really make it look quite good. So straightforward, simple, but not as beautiful as it could be. And you need some powerful hardware really to get this working well.

So the other workflow is basically taking your content in Revit, or wherever, I mean, SketchUp, any place where really you create your projects, bringing it into a 3D editor, such as 3Ds Max. Although, it's not 100% necessary. You can use Maya. Any 3D package can work well. But 3Ds Max does work quite well with this workflow. And then, bringing it into Stingray, which is essentially what we're going to use to bring this to life, to make it interactive.

Stingray-- just a little bit of background for those who don't know-- essentially, it's a video game engine. And there's a lot out. Well, not a lot, but there are some heavy hitters, we'll say, that are out there. Unreal Engine, that's basically one of the big ones that are out there. And it's also used for something similar to this. There's also Unity, which is less costly, free, depending on what you're trying to do. All of them have their pros and cons. Essentially with Stingray, it works great with Autodesk products, obviously.

So the pros with this workflow is that basically you can really optimize and fine tune everything. So in terms of the number of polygons in there, shaders, or the materials, how you organize your levels. With Revit, the other workflow, you just take everything and dump it into one project. Maybe for example, if you're doing a multi story building, it's not a good idea to just dump everything in there. We can make separate levels, so to speak. Essentially, there are game levels for each floor. It's just a more-- well, it's just a smarter way, really, to curate your project.

Also it allows you to add assets that are not available in Revit. So if there's something that you like, a certain chair that you like, so you like a certain designer, you want to use their chairs, you have a model, or you can model it yourself. It's possible in this. With the other method, you essentially stuck with what you get in Revit. And also you can do animation. And we'll see a little of that also.

So cons, obviously, it's a lot more work. Also you lose any RPC assets. So I don't know if you've used it before. But let's say, in Revit, I can use RPC assets to easily add people into the scene trees, some vehicles, boats and cars. It's not, we'll say, photorealistic. But I mean, it's quite good for the, let's say, time involved. I mean, you just drag and drop. And you have a whole bunch of people on the scene.

So you will lose those assets. But I wouldn't really worry too much about this. With 3Ds Max there is ways to essentially reproduce that effect. And in my opinion, actually, you can achieve a better result than what you have with RPC assets. And then, you also lose your BIM information. Whether or not this is important to you, I mean, it's up to you. But I mean, obviously, there's more than one way to present this information to your client.

OK, so let's go ahead and get started. Now, just give me a second as I switch things up, just to make it easier for me to see what I'm doing. Also I do have a bit of a cold. It seems to have happened on the worst day possible. So please forgive me for any coughs, throat clearing, or sniffles that I may have on this microphone. Duplicate, yes, OK.

All right, so how does this work? Well, first, you take your project that you made in Revit. I'll click on this. Very simple, I mean, it doesn't make any sense. It's just that it's very quick for the sake of this, of this example. So here's my content. It has a floor, a ceiling, a building, some lights, and also some RPC content, so as you can see, trees, some people. For those who have never worked with it before, they may look a bit funny. They look like cardboard cutouts.

But when you do render it-- let me see-- it will replace the representations that you see here with something more photorealistic, as you can see here. So the trees actually look like trees. And the people do look like people. So quick, easy, but not necessarily the best.

Now, actually, one thing that I do want to mention-- and this is in the notes that I've provided-- if you want to have these contents, you can download from the Autodesk app store the free Entourage pack. There's a link in the content that I've provided. It's free. It'll install things for 3Ds Max and Revit. And I'm using some of this right now. OK, so let me just make sure I have everything else set up.

So once you have everything ready to export, what we can do is we'll go to add-ins, and then-- sorry, let me just get out of this. OK, so once you have your project finished, what you need to do is you'll need to go into your add-ins and there's basically a Go Live option. OK, now, this is cloud-based. So your computer will need to be connected to the internet. So what will happen is you click on Go Live and just hit Go. I mean, it really isn't that complicated. Now, one thing that you do need to make sure is that you should set your-- let me just close this for a second. Make sure that you set your detail to fine before you do this. If you don't, you won't be able to do the Go Live function.

So basically, you choose where you want to save it, extend the trend horizon, that's really not that important, and then you hit Go. Now, I'm not going to wait through the whole process. But it's quite easy to see. So it's going to upload it, prepare it, and then downloaded onto your computer. And it'll also send an email to the account that is associated with your Revit product. OK, now, since this is based on the cloud, sometimes different times of the day you may have to wait longer than others. OK, if it's something like your business hours, expect that you may end up in a queue. And you'll see that there. Your project will be certain, whatever, number two of four, something like that.

OK, once it's downloaded, you'll find that in the area, or the folder that you chose-- also you'll get an email that will allow you to re-download, if you want to. OK, so if you're working on another computer, and it's like, oh, I need those files, just go ahead and open up your email. And you can re-download the file that was created for you. So like I said, we don't really need to do this. So what it's going to create, basically, is a live model file, as you see here. So it's a dot .lvmd, a live model file.

So let's go ahead and go into Autodesk Live. And I'll open up the project that I have. So like I

said, not beautiful, done very quickly, just for the sake of this presentation, But I'll open up something else that will show you a little bit more in terms of aesthetically how it looks. So what's interesting about this is, essentially, this is fully interactive. OK, so I can go and look around, just like in a video game. The RPC contents, as you see here, have actually been changed to true 3D objects. OK, so for those who aren't really familiar of how it works, RPC content is essentially a series of images taken from different angles. So let's say they wanted to put me in there, it would be multiple images taken around me. And based on the angle, it'll just switch the images up. So I mean, it's never really, fully realistic.

So with Live Design we do have some 3D equivalents of those, not all, so basically, people and trees, vehicles, no. So you won't-- if you had-- you notice, well, you may not have noticed-- but in Revit, I had a Volkswagen Beetle just around the corner. And you see it's not here. So one disadvantage, I mean, this is something you'll just have to work around. And there's actually animation. If you take a look, you'll see the trees are blowing in the wind.

So, a few ways to navigate, so I'm just doing what I am. Yep.

AUDIENCE: I just want to clarify. You didn't do anything. This is exactly how it downloaded?

BEN BISARES: Yeah, exactly. So, yeah, I didn't do anything. The people will be these white, nondescript people. But yes, I mean, I know I skipped it. But I mean, this is exactly what you saw on Revit, basically.

AUDIENCE: OK, thank you.

BEN BISARES: No problem. So two ways of navigating, so, again, since I'm a video gamer, I'm using-- obviously, you can't see, but the WASD movement, so, W-S-A-D. So I'm hitting W to go forward, S to move backward, and D to shift left and right. And then, I'm using the mouse to look around. There's another method, the tap and go. OK, so this may be a little bit easier for non video gamers. So you simply double click, and you end up where you want to be.

In the Live Editor, you can also create views. OK, so if you're trying to create a story for your customer, then you can go ahead and create these views. And you can just jump from one to the other. And also there is animation to a certain degree. So what that means is you'll notice this is a door. And again, I just plopped the Revit door in there. I didn't do anything special. You'll see that, as I approach the door, it opens for you. And it closes as you walk away at some point. There it is. Closes, and the one behind me will open up into my face. So yes, like I

said, fully interactive.

What you have also is the sun. So if you're doing any kind of lighting analysis, you can basically choose the sun position and the date. And you could animate this if you want. Change the style. Yeah, actually, let's do this now. So let me just back up a little bit. So I did mention that it does conserve the BIM information. And this is from Revit. So if I click on info, there it is. And click on anything, there's the information right there, so basic wall. I mean, for those who know Revit, I mean, this is all information that you're quite familiar with.

Change the rendering style. So if you wanted, let's say-- I mean my materials aren't really that much different than pure white. OK, but a lot of times when you're analyzing like, you do want to see just very basic materials, so you get a better idea of how the light is interacting with the scene. And this also removes all the color in there. I mean, my personal preference is really to just stick with this.

So if you're happy with the results, now, you want to send this to your customer. What you have also is the Live Viewer. So this is free. The Live Editor, no, but the Live Viewer is free for anyone to download. And all you have to do is either publish to Windows. OK, so at the moment, yes, it's a Windows platform, only with a beta version to the iPad, iPad Air and later, so the more recent iPads. The way this would work is there is an app that you can find on the App Store, that they download. And then, you simply-- this will generate an email that you would send to the customer. And when they click on that link, that's how they get the file to the iPad. OK, so publish to Windows, and it would create a standalone file that they would open in the Live Viewer, which looks almost the same as this, but with less UI around it.

Settings, just in case, nothing really important that we'll need to worry about. And the other thing that's quite interesting-- I don't know if you can see it. I really can't see it from this angle. But there is a VR option. So when you click on this, it will send it to your HMD. So you know what that means? It's the head mounted device. So you may see that term pop up every now and then. HMD not connected, and you're wondering what is that. Head mounted device, which is like the generic term for your VR headset.

Since I don't have this connected, I'll be honest, VR really isn't conductive for large presentations like this. I've seen people try to do it. And it's fumbly. And no one's really-- you have one person enjoying it, and then like everyone else is just sitting there flipping through Facebook or something like that. So I have prerecorded videos, so at least you can get an

idea of what it looks like. I'm just curious. I'm just going to click on this. Yeah, so there it is, no head mounted display is detected. OK, so you need to have it attached and running, and then it would send the information straight to your VR headset, or your HMD, cool? Yep, all right, let me see anything else I need to mention? I think that's it really.

That's fine, I'd say. All right, so let's take a look at something much nicer than what you see here. Now, just in case you're wondering, I have a MacBook here. I'm not bragging or anything. I'm not an Apple fanboy. What I'm trying to say is I have a mid-range graphics card in here. And I'm running at 1280 by 720, for the tech geeks out there. And performance, I'll say, is acceptable. But it's not optimal. OK, so you really need to invest in the hardware. If you're wondering, in a nutshell, whatever's good for gaming is good for live design. So if you see those huge, bulky gaming laptops or desktops, that's what you want. Because this is leveraging the GPU. I don't know if my microphone is picking up the fans. But they'll go crazy when I started doing a lot of this stuff.

So usually, I work from a desktop. But I really didn't feel like bringing it from quite literally the other side of the world. I currently live and work in Singapore. So yeah, I wasn't in the mood to do to bring it all the way over here.

So here's a better representation of what you can do here. And as you can see, you have these views. It's a little bit hard to see. It looks like the little map marker on Google Maps. So you double-click on that, and boom. It will send the viewer to that area. So you can set up some views, what you believe is the best view to see your project. OK, so there's some people in there. And again, if they want to, I mean, they can go ahead and go where they want themselves. Or they can navigate to specific areas or views with the materials.

Go up the stairs that you have here. I'm trying to do this slowly. So I don't make any one motion sick. Once again, your doors, these ones, if I'm not mistaken, don't open, because set to do not disturb. But some other ones will. OK, so like I said, for a one-click solution, this is amazing. I'll be honest. When I first saw it, I'm like, hey, wow, that's great. Yep.

AUDIENCE: [INAUDIBLE] in Stingray. Can you [INAUDIBLE] in Stingray?

BEN BISARES: Yes, you can actually. So in case you're wondering, this actually is a Stingray project. OK, so that's a good thing. I'll bring it up now. If you want to open this up in Stingray, what you can do is-- let's say the simpler way is to actually just rename this to zip, and then use whatever you want, essentially, to extract the files. Now, I'm using 7-Zip, so I can actually attempt to extract

any file. And what it's going to create is a folder containing all the assets that you can go ahead and open up in Stingray. OK, so there is an addition to this. You can mix a little of this. But 90 minutes, I don't want to get too deep into this. But for those who don't have the time to invest too much-- sorry, let me start that over. For those who don't have the time, necessarily, to invest the learning into the whole VR or interactive workflow, this is a good one-step method, we'll say.

OK, so let's close that. And let's go back to my PowerPoint. So there's Revit to Live Editor. Sorry, let me just check and see how I'm doing on time. That's fine. So a few things to keep in mind with this method, so photometric lights will be converted to simple lights. So if you have lights that have IES information-- so for example, well, we can actually look at the lights here. You can see they're throwing a pattern because of the reflector that's built into the light. It's not just an even distribution of light. So if you're using IES lights, you're going to lose this information. OK, so they'll be converted to simple lights. If you know 3ds Max, you'll know what I'm talking about. I'll go over it when we go into 3ds Max. So again, not all RPC content will be brought over. And your project can be viewed using the Live Viewer on both Windows and iOS.

AUDIENCE: I have a question.

BEN BISARES: Sure.

AUDIENCE: [INAUDIBLE]

BEN BISARES: Not in the Live Editor. You'd have to do it in Revit or Stingray. But again, I don't want to get into that right now. But yes, it's possible. But in the Live Editor, no, you can't do any of those changes. You should do it in Revit beforehand. But then, you'd have to resubmit using the Go Live function.

AUDIENCE: [INAUDIBLE]

BEN BISARES: The BIM information, or--

AUDIENCE: [INAUDIBLE]

BEN BISARES: In Live Editor, yes, I mean, you saw, actually, I closed it. But yeah, see the information is conserved. And you can view it. There is just an Info button. And when you click on the object or the item, it will appear. Did I see another hand? OK, sorry if I'm pushing this along. It's just I

don't want to run out of time. Like I said, we can always have a little chat after this, if you want.

So Revit to 3ds Max. So here's where it gets a little bit complicated. Let me open up 3ds Max. What I'm showing you is not the only method to do this. There are other ways. Obviously, for those of you who've been doing this for a while, Revit to Max. But I'm just trying to show the simplest, the most straightforward way, at the moment. So once again, we're in Revit. And we can just use the Suite Workflows, and then just send it to 3ds Max. So there we go.

So I'll do it with this. Although, this is not what I'm going to be using for the rest of the presentation. Let's go exterior. So here it is. Whoops, that's not what I wanted. So once again, here it is in 3ds Max. So this was actually not something I did before. It really did just happen a few seconds ago. The RPC content is there. But like I said, you might as well just delete it. Once you bring it into Stingray, you're not going to really have that. And like I said, there actually are better ways to do that.

So in 3ds Max, you can go ahead and do your changes. Now, one thing I do want to mention, Stingray is not-- what is this? Let me mention it now. So point number two, I'll come back to this in a bit. But Stingray is not compatible with file names that have more than one dot in it. Now, why exactly is that important? A lot of the textures-- if you've seen the file names, it's like oak.redcherry.something.jpeg-- those aren't going to work. You bring it into 3ds Max, and you'll still see it. And then, you bring it into-- sorry, what am I saying. You bring it into Stingray, and then you'll get the question mark. Basically, it is something that's going to be fixed at a certain point. But at the moment, you need to keep that in mind, OK?

All right, so let's see. So what you would do in 3ds Max is further refine, make any changes, do what you want to do, and then you can bring it into Stingray. So let me just close the Revit for now. And let's not use this. Because this is admittedly quite ugly. So let me just open up what we'll be using for this. If you can't hear me, tell me.

So what I have here is actually a loft that I used to live in, when I was living in Montreal, Canada. A little bit more than that, I just have things hidden. I liked it so much I decided to make it in 3D. So this is actually pure 3ds Max that we're seeing here. There's nothing from Revit. What am I missing here? There we go. Maybe makes it a little easier to see.

So we have an entire loft. There's a mezzanine. So we have this half floor here, and just some basic things that are in here. So how do we go ahead and bring that into Revit? So materials, they're best done in 3ds Max. So a few things to keep in mind when you're working now in 3ds

Max, I wouldn't spend too much time trying to perfect the materials in Revit. One, like I said, some of the textures are not compatible anyways with Stingray, at the moment. OK, so it's best to do it here. Also if you want a better representation of what you will see in Stingray, there is a material or a shader in 3ds Max that's not available in Revit, that's better or best to use.

OK, so again, lights not the same. I wouldn't worry too much about creating lights, although, if you want to create lights so that you have the enclosure, the holder for it in Revit, feel free to do that. But at least, for me, again my personal opinion, once you bring it into Max, delete those lights. You can work around it once you get into Stingray. But it's a lot of work. I'll get into it a little bit later. OK, RPC content loss, so go ahead and delete that.

And the last point is-- so let's say I'm done in 3ds Max. How do I go ahead now and bring this into Stingray? So what you need to do first is-- what am I going to export? You could, if you wanted to, just select everything you have in there. Let me get rid of these. It's, we'll say, a distraction at the moment. Well, we'll see that a little bit later. Did I lock this? That's fine. OK, whatever, let's not spend too much time on this. OK, so if you wanted to, you could actually just select everything, and then send it to Stingray by simply going into your Stingray menu, and then Send Selection.

OK, if you plan to move any of these elements selected independently, or have any interaction, you really shouldn't all included in the same object. So what that means is, if I plan to do a project in Stingray, where I could potentially have the viewer move the couch, maybe not have it here, move it over there, change materials. I don't like the material on the table. Let's move it to something else. Those should always be separate. So at least with this, what we have here, my suggestion the structure is fine. So floors, walls, ceilings, stairs, doors, windows, go ahead and select all of those, and then send that to Stingray. That works fine.

One thing also, again, I suggest-- I need to start Stingray to do this-- assign materials at this point. What you don't want to do is select-- so let's say I'm going to do my structure. So let's start hiding things. Layers, highly suggested, please organize everything you have in layers. Because it does make your life easier. Shells, let's see, no, no. No, all right, whoops. OK, so yes, so this is OK.

So yes, OK, so for when it comes to materials, it's best that at the very least you assign materials to the objects that you want to look different. The last thing you want to do is, for

example, have this selected all, and then apply the same material to it, so something like this. Now, the problem with this is that, when you bring it into Stingray, through a certain fashion, which we'll see a little bit later, you can select the individual elements. It doesn't come in as just one piece. You could make some changes to individual parts. But materials, now, will all be the same. So if I change the material for the floor, it's going to apply to everything.

So at this point, if I want the walls to be different from the floor, at the very least, make two materials, and then apply it to each. Or make two materials and apply those to the walls, and then the other one to the floor. In terms of how it looks, it's not important that it looks exactly the way you want. But it's not a bad idea to start doing this now.

Now, when it comes to the materials itself, what can you use? OK, for those who have used 3ds Max, we do have quite a few materials, or, we'll say, shaders. I'm not going to get into the technicality between the two. If I say shader or material, for now, let's just assume I'm talking about the same thing. I really suggest that we use what's called a DirectX shader. OK, you may have heard of this before. DirectX, basically, what it is it's a GPU-API. It was created by Microsoft. I'm not going to get into all the details. But since Stingray is leveraging the GPU, we should probably use this DirectX shader. Because what we're going to see in 3ds Max in the viewport is what we're going to see in Stingray. OK, so there's no need to render or anything like that. If you apply a DirectX shader, and then start making the changes, guaranteed, what you see here in Max, just in the viewport as is, is what you're going to see in Stingray. So I suggest that you use this.

So again, I'm going to be going really quickly through this. Take a look at the content that I provided for this class for further details. So let's say whatever, walls. Under the DirectX shader section, what I'm going to do is I'm going to choose Stingray. Long story short, Stingray just has a subset of all of the attributes that are available to us. So I mean, I could use some of these other ones. But there's going to be some attributes that Stingray's not going to use. So I might as well keep things simple. And, excuse me, and choose Stingray. Let me just take a sip of water.

And for now to keeps things simple, let me just change the color. So that's fine. Those are the walls. So once again, just repeating this. Sorry, I'm just making sure I'm OK for time. And whatever, we'll make it blue. And just simply drag and drop this onto the floor. And you would repeat for everything that's here, that you want to be different. If you want the walls, the ceiling, and, let's say, this molding to look the same, go ahead and apply the same material to

these objects. That's fine. Anything you want to appear different, make sure that you apply them, the material that you want, separately.

So once that's done, let's say I'm OK with this. I'll select everything that we have here, go to Stingray. And before we do this, we would go into Stingray, and then create our project. Now, if I click on Templates, so there are a few templates that we have in Stingray for the different types of projects that we want to create. If we're doing architecture, really, what you want is either basic, empty, or one of the two VR templates. There's VR Oculus, VR Steam. Those are for the two, at the moment, we'll say, options that we have available to us. There is, for example, the Playstation VR. We also have Google Cardboard. Those don't count, in terms of what we're doing here, the two that we can attach to a PC. There's character, that's more if I'm creating a game vehicle, driving game. This is doesn't apply to us.

So what are the difference between the templates? OK, we have basic versus empty. Which one do we want? It's pretty simple. Empty, really, is quite literally just an empty seat. OK, basic, what that has, it has a few pre-built options for us. So it has a built-in menu. And we'll say player that can move around, not like a physical character that we can see. But for those of you who have played first person shooters, I can actually just move around and jump in the scene. It's not just a floating camera that I can shoot to the moon if I wanted to. There's some gravity to it. He's pulled down. And there's also some UI elements specific to each platform. And I'll show you a little sample of that a little bit later.

So if I'm playing this in Windows, I'll see certain UI elements on the screen. If I go and I'll put this to an Android device, then I'll get more of what we see, if you're playing mobile games, kind of like these floating buttons there. Those are automatically there for you. So might as well use basic, unless you're a pro at Stingray, you know your coding, you know your LUA, you know scale form to create your UI, maybe then you do empty. OK, but for those of us who are just getting our feet wet, choose basic. OK, and then, like I said, Steam versus Oculus.

Now, Steam, in case you're wondering where exactly does that come from, so Steam is a company, a video game company, essentially. And they helped in conjunction with HTC. It's a company that creates mobile phones to create the Vive. OK, so if you're wondering why VR Steam is using the Vive, it's basically a collaboration between the two companies. And then, well, VR Oculus is the Oculus Rift.

So let's just go quickly into the differences between the two. So the difference between the

HTC Vive and the Oculus, in my opinion, is really room scale. OK, with the Oculus, and I'll come back to it, it's really a seated experience. OK, you set it up. You sit down in front of your computer, you put on the headset, and you're there for the rest of the show. OK, so that's fine. It tracks your head. So if I look up and down, and even like cock my head left and right, it'll track that. But essentially, I'm just always sitting in the same place.

With the HTC Vive, you can assign an area where the user can walk around. The minimum is six feet by five feet. To my knowledge, and someone please correct me if they know, there was no announced maximum area. I know, for example, you can see these two little boxes at the side. These are essentially the light emitter or the sensors, we'll say. It's not really a sensor. But I'll get into that later. Those, apparently, can be placed maximum five meters apart. So that might give you an idea of the area that you can walk around in. But apparently, people have gone larger and it works. So to my knowledge, like I said, I've never been given a maximum size.

So what that means is that I can actually walk around. So I'm inside my loft. I can look around. If I move my head up and down, it moves. But if I want to see what's around the corner, sure, I can just go and walk there, to a certain degree. OK, if I'm not careful, I'll end up walking into my desk, which I've done and stubbed my finger, or hit my head on the lamp. It happens. So that's another fun thing, we can say, with the HTC Vive. But you have an area that you can play in. Now, obviously, if I've created this room, six feet by five feet, I mean, that'll just limit me to the area that I'm in now. How would I get to the other side of the room? We'll see that a little bit later.

It also, at the moment, has these Wii-like, the Nintendo Wii, motion track controllers. So essentially, just imagine each one represents your left hand and your right hand. OK, you move your hands around and it can sense that. So I can actually do the motion of picking something up with these controllers, and also move. And this was just announced. And when I say just announced, like this week, if I'm not mistaken, they just announced that there's actually a wireless add-on.

The problem with virtual reality headsets at the moment, there are a few. It is new. Like I said, it's still it's not a mature technology. One, there's always a cable attached to your computer. I've seen people try to make a fully non-tethered version. They'll have a super, giant laptop and a backpack, and then they'll carry it around. And I mean, I guess it works. But I mean, it's

obviously not convenient. But generally, you're tethered to the computer that you're on. So there's another problem. I mean, if where you're seated is far away from your computer, this is going to be an issue. For me my computer's beside my monitor, which is all on my desk. So that's OK.

But with HTC, they announced this wireless add-on, which $199 US, if I'm not mistaken. And like I said, it's not out yet. So I'm not sure. So that will turn this into a wireless setting, which is quite interesting. No reviews, I don't know if it's good or bad. But remember, you still need a pretty expensive computer. And this is not cheap either, $799. OK, maybe prices change a little bit. But last I heard, that's what I paid $799, plus your very expensive computer. So it's not a cheap thing to get into.

So Oculus Rift, like I said, seated experience. But another difference is that, at the moment, you have just a console controller. So moving around, you're holding a little joystick like you see, yourself. I mean, if you play games, or your kids, when they're playing on their XBOX, that's exactly what they're using, in my opinion, less immersive. If I want to go forward, I'm just moving a stick forward and backwards. I'm not actually walking around the room. Price, that is incorrect. That's my fault, what $600, $599, if I'm not mistaken.

But they have announced that they will release these touch controllers, which will end up turning it like the HTC Vive. They've also, if I'm not mistaken again, this is all announced-- so I didn't put it in there-- that they're going to allow multiple sensors, which could then turn this into a room scale experience. So eventually, I mean, it looks like they're all going to converge at the same point. Which one do you want? If you're going to buy one today, I mean, personal opinion, HTC Vive. But obviously, I mean, it's up to you to choose what you want.

OK, so back into Stingray. So you would go ahead and then choose the project that you want to have. So let's say, for example, I'll just go basic. Basic project, that's fine, hit Create. Let me just check something. I know this is a really big screen that we have. But I found a lot of the classes here I could not see anything that the people were showing. So let me make things a bit bigger for everyone. Sorry, let me do one more thing. Apologies for all these little changes that I'm doing. It just makes it easier to do. OK, so it's going to generate all the assets that we need for this. I'm not going to do a runaround of the UI. Again, we just simply don't have any time for it.

What I'm trying to do-- Again, let me just repeat from what I said at the beginning. What I want

you guys-- the key takeaway here, really, is not how exactly did he do what he did. It's more, now that you have the knowledge of what the potential of this workflow is, and that you have enough knowledge to go learn for yourselves efficiently. OK, I mean, you can't just plop someone in front of Stingray, who has no idea what it does, and say go learn. What I'm hoping is, after this class, you now know what direction you want to head in. And then, you need to start learning for yourself. It's an hour and a half. Obviously, no one's going to be a pro in Stingray after this.

OK, so when we have our basic project, what it consists of, actually, is a main menu. So if I actually run it, you'll have your main menu. This is just the default. You can change it. And I hit Start, and then it actually goes into the level itself. OK, and since I'm on Windows, you can see those little arrow UI. OK, so you can actually see if I'm moving forwards, backwards, left, or right. And F2 puts me in a player mode. So now, this is more like I'm an actual player. There is gravity. I can jump around. If I walk off a ledge, then I'll keep on falling. OK, whereas, if I'm not in the player mode, it's basically no gravity. I can just go as high as I want. I can go through the floor down. There it is. I don't know if you see it. But I've just gone through the floor. So that's what the basic project is.

So once I have that set up, now, let's say I don't want these things. There is another way to do this, which is in my notes. If you want to get rid of this stuff, I mean, if you don't want the box in the floor, no problem, just go ahead and select and delete. Or you could go ahead and create a new level. So what we have is we have projects, and then we have levels in the project. So it's just like a video game. You've played Super Mario. You have level one, level two. You could do that with your project.

Now, do you need levels? You have to have at least one. OK, but what I feel you can use levels for, like I said, if you're going to have like a multistory project, it's best that you just break this up. OK if you have the first floor, the second floor, in different levels, parking garage or something like that, it doesn't make sense to build it all in the same thing. One, you're just making it harder for the computer. OK, and it has to keep everything in RAM and track all those things that you can't see. OK, so really separate it to the bare essentials. And then, we could create levels for that. And then simply, let's say I'm creating this floor. I could create a level for this room. And when the user walks up to the door, let's just automatically load the level of what's outside, something like that.

So I'll stay in this level here, so everything's ready. Let's go back to Max. And I'll go Stingray,

Send Selection. Let me connect first, and then Send Selection. So you'll see now, where is it saving it? It's actually, automatically positioned me where my project is in Stingray, basic project two. Let's go back here, basic project two. OK, so it's automatically placing it in the folder of my project in Stingray. Now, when it comes to organizing the content in a project, it's up to you. OK, there are some defaults in there, a folder with content that has audio level materials, yada, yada, yada, and some script. It's up to you to go ahead and do it. But I mean, you really should. I mean, if you're creating content, put it in the content folder. Do you have to use what's there? No, if I wanted to, I could go ahead and say I'll create a folder just for my room. And this will be the structure. And it's going to save it as an FBX, no other option. If you want to bring it into Stingray, it has to be an FBX.

And once I go, excuse me, hit send. In Stingray, I get the FBX Import options, excuse me. What do I need? So if there's no animation, you can just get rid of this. What I do suggest you have are materials. If you have textures, go ahead and check mark that. If you don't, go ahead and leave it there. It's not really that much of really a big problem if you leave it. The really thing that's important is this Generate UVs for Light Baking, which we'll take a look at a little bit later.

The other things, like I said, I don't want to get too into it right now. Because we really don't have the time for that. And at the moment, it's fine with what we have. So I've imported it. Where is it? I don't see anything. You'll see it here in, basically, your Asset Browser. So if I go into content, now, you'll see a room. So this is the same representation of the actual folder in Windows. And there's my structure. So all I have to do is drag and drop this into Stingray somewhere.

Now, essentially, if you want everything to appear exactly in the same place that you had in Max, it's very simple. Make sure everything is at 0, 0, 0. That's all you need to know. So one quick way, actually, is right-clicking on the spinner that we have. And that will just zero out everything. And I'll hit F to frame my object. And there it is in my seat. So if I hold down the right mouse button, I can use FPS, first person player controls. So I can walk around and take a look at what I have.

OK, now, you'll see this actually is just one object. I can't select just the stairs, or the railing, or just the floors. I could still access it. If you remember, I said after a fashion. If I go into the Unit Editor, then I can go in and make some changes. So if I want to, for example, do something with the floor, or the walls, or let's say the window frames, it's still accessible here. But I can't

really move these relative to each other. So like I said, if I brought in the sofa, the table with all of this, it's stuck where it is. OK, but don't worry, I mean, you'll get the hang of it. I mean, a little bit of practice and you'll know you what you want to bring in together into Stingray.

But it does allow me to do things like change some of the materials. So I can select the floor, go into Materials, and then go ahead and choose a material that's in the scene. If I wanted to create new materials, what I can do is go into the Materials folder, in the Asset Browser, right-click Create, and then Material. So you can see I have the floors and walls, the white and the blue, that I made. This could be another floor, so floor two. And if I select this, it looks slightly different. But it's the same attributes that we have with our Stingray shader in 3ds Max. And again, I'm keeping things simple right now.

I'll just choose a color, floor two, save that. I can go back into my room. Let's see. And into the Unit Editor. I just double-clicked. Select the floor, material, sets, and for the floor, go ahead and choose the material I created. It should be somewhere, floor two. OK, and there it is. So I'll save that. And eventually, you'll see the yellow floor that's in there. You don't see it right now. Because it's actually saving it. You see this little thing that's spinning here. All right, so there it is.

So let me just continue with some other things. I'm not going to do the entire room, again for the sake of efficiency. Whoops. So let me go ahead, and let's say, what am I going to bring in here now, sofa. So again, what do you do? Make sure the sofa has the materials that you want. It looks like something's missing. I'm not going to be-- we're shifted over. I think I moved. Yeah, I did move the sofa when I was showing things to you. Again, I won't worry too much about it. Select Stingray, Send Selection, wherever you want, OK, so whatever, furniture.

Go back into Stingray, I'll have my FBX import options. Everything the way it is is OK. Import, and where will I find it? I will find it in the Asset Browser at first. So let's see, furniture. And there's the sofa. So again, drag and drop it somewhere in the scene. OK, it's still loading. Whoops, kind of happens, if you're a little bit too fast. If you don't wait for everything to load, and you try to drag things in, you'll get a small crash. But you can restart. So drag it in anywhere in the scene. It doesn't matter. And then, just zero it out. And it'll appear exactly the way it was placed in 3ds Max, OK? So I mean, that's basically importing stuff in there. Materials, again, this is actually stuff that is fairly straightforward to learn yourself. So I'm not going to waste too much time. I want to get to the interesting bits. So let's skip ahead. Sure.

OK, so this is basically the room that we have at the moment. So if you want to add lights, what I can do is just to create lights, and then add a light in the scene. If I go ahead and go to the properties of the light, which are here, you can see-- if you're used to the lights in Revit, or, for example, the photometric lights in 3ds Max-- you are really lacking a lot of the options. OK, it really is the same thing as just the simple, sorry, not simple, but the standard lights in 3ds Max.

OK, whatever, I'm not going to worry too much about it. So I mean, the lights in 3ds Max, really, in terms of the values, you just have a multiplier, one is the default. You can put it lower or higher. This isn't in things like lumens. It's not on any actual light unit. Color, we're not using things like temperature. It's not like, whatever, 65k or 32k. It's just color. But we do have things like attenuation, how far the light goes, when does it start to fade out. There are some of those options. And it's exactly the same in Stingray. Color intensity, and then you have fall off and whether or not it has shadows, things of that nature.

OK, so like I said, don't worry too much about your lights in Revit. It's not going to look the same anyways. So we can go ahead and place our lights in the scene. And in terms of the type, let me create another one. We're basically stuck to this. OK, omnidirectional, so it's basically like a light bulb, in the sense that the light goes out in all directions.

We have a spotlight, which means that there is a cone angle for this, a directional light, which is like a sun, and then we have a box light, think of it like a spotlight. But it's really just constrained to this square shape that you have here. Best description without spending too much time, think of it like, I would say, a directional light with a limited area. It's good for, let's say, having sun come in through windows, things of that nature. If you use a directional light, the light exists throughout the entire scene. It's more expensive. And when we say expensive, that means it uses up more hardware resources. So if I'm trying to make this more efficient, and I'm trying to do a sun, use a box light. Again, not too important at this moment, I just want to give you a brief description.

OK, let me-- let's see, decals. Oh, yeah, now, there is another way to create a light in Stingray. And you can use what's called an emissive-- or give a material or a shade or an emissive attribute. Now, emissive just basically means glow. And you can do this also in 3ds Max, though through a slightly different way. So let's say, whatever, create a cube.

So if I wanted to create something like a fluorescent panel, so I don't want to have a light

source that's coming from just a small point. I want from a wide area. How can I do this? Create for example, so if I was doing a fluorescent panel, it would probably be something more like this. It's not being precise. And this would be somewhere placed near the ceiling.

Then, I can create a material for this. I'm going to go to the material folder. But again, this is simply because it's just a good idea to organize things in this fashion. You don't always have to create it in the material folder. Let's say fluorescent. I assume I spelled that correctly. And we have emissive here. So right now, it's set to black. I could go ahead and set this to something like white. Let's save that. And let's go ahead and change the material for that. Let's see fluorescent.

And let's just go crazy for now. And there it is. OK, so you can see it's actually acting like a light. I can move this around, just so you can see the effect it has on what's around there. And you can also see it looks like there's a glow around there. That's actually one of the, let's say, default eye candy that we have available, or applied to a project. This is actually called bloom. If you've played video games, and you like to play around with your settings on a PC, you probably know this. This is essentially a post effect. And it's an effect that's applied to the scene. And we can enable or disable it. Anything that's really bright will have this subtle glow around it. I'm not sure how well you see it over here.

So essentially, those are your lights. Now, one thing that you can do with your lights is you can actually bake it. OK, now, what this is is a process of calculating the lights, and then creating an image that represents the lighting in the scene. Now, if you remember when I was importing some things into Stingray-- so let me go ahead and do it with some other content-- or actually, let me import, but then cancel.

OK, there's generate UVs for light baking. What this is, it'll create-- now, I'm saying this for those of you who probably are a little bit more familiar with creating objects in 3ds Max. It's going to create another UV set on the object that is strictly for the texture that's going to be created for light baking. OK, now, why exactly is light baking interesting for us? Lights, in general, are expensive. Again, it takes a lot of processing power for the GPU to calculate all the lights in the scene. One light, two lights, not a problem, if you're placing 50 lights, your scene is going to chug down, OK?

Like right now, for example, on my not so great laptop, I'm getting roughly 60 frames per second, not too bad to be honest. But the more lights allowed in the scene, and you'll see that

FPS counter will go down. OK, so what we can do is bake a light. And that creates a texture, which is applied. And essentially, it costs very little now to have the effect of that light in the scene, but without actually having the light being calculated for every frame that's generated. The downside to this is that you don't want to do it on any light that's going to be interactive. If you're going to create a scene, where I can go in and flip a switch to turn the lights on and off, don't do it, don't do light baking on that light-- we can do it on a per light basis-- or any areas where things may move. If I have, for example, a light-- OK, my couch isn't in here. But let's say I had a light right beside the couch, and then I did a bake, and then I did a scene where the user can go and move the couch. You're going to see the shadow of the couch still on the floor in the old place. OK, so there are pros and cons of light baking. Again, you'd have to play around with it to see really where its best suited for your needs.

Let's see. I'm really trying to get the essentials done with the time that we have. OK, so let's say, for example, you're done with your lights. You're done with your materials. What do we need to do next? OK, we need to make sure that there's some collisions in the scene. Now, what I mean by that is remember that we do actually have a player. So let's say I'm creating a scene that I'm going to export to a tablet. So the problem with this is, if I have the player start, he's-- oh, I already created the collisions for this. But the problem is you may have the potential that he just falls. OK, if there's no collisions, essentially, he'll go through everything, or he, or she, it, whatever.

So what we need to do is to make sure that there's collisions in the scene. The other thing is also, when it comes to VR-- so let's take a look at this video here. So this is something I recorded of this. So what we're looking at now is essentially what we see on the screen when we run a VR project. There's these two circles. They represent the left eye and the right eye. OK if I have my VR headset on. I don't see two circles in front of me. I basically just see what I would normally see, if I'm just looking at the screen. OK, but remember, for 3D, for this to work, what happens is you need to have a display for each eye. And the way that we interpret, or feel, the 3D is that there's a slightly different angle for each one. And that's how 3D works, in general, OK? Each of your left eye and your right eye sees a slightly different image. And your brain interprets that as depth.

So with the HTC Vive, like I said, it's room scale. So just give me a second, I'm putting it on. So there it is. I'm looking around the room. I have some lights. And eventually, I'll look at the controllers. So what happens is, actually, with the HTC Vive and Stingray, you do see the

controllers floating around in front of you. You can change this to something else, if you wanted to, or even change the functionality. If anyone knows of VRED, which is our automotive product, the controllers look kind of different. They have some additional tools and options on it. So it's quite interesting. But I mean, all of these are customizable. You can customize it to your needs. You don't like black, you want whatever, a different color, not a problem.

So what it uses is teleportation. So you'll see that you point, you hit a button, essentially, and it gives you an idea of where you're going to jump to in the scene. So yes, I can walk around. But obviously, this room is much larger than, let's say, the 6 by five foot box that I have available to me. So what I can do is teleport. Now, to define an area as teleportable, if that's an actual word, what we need to do is add a collision to that. And anything that's essentially horizontal it will see it as something that you can teleport to. So even though, I have, for example, the wall set too-- or a collision set on the walls, I can't teleport onto a wall. You'll see that it'll turn red when it's not a valid target that you're trying to jump to.

And like I said, you can walk around. I'm walking around my old kitchen. And I'll jump to another place at some point. But I can go ahead and jump upstairs on the mezzanine. And so you can see, if it's not a valid point, there'll be a little x telling you you can't go there. And here I am. Now, I'm upstairs on the mezzanine. And I can go-- well, I think I've walked around and looked around the corner, that kind of thing. So I was walking forward, not so obvious when you're viewing it in the video. But I was walking, and then I can just look over the railing.

OK, so to essentially not have the player fall through, if you're just doing a basic project, or define a space as teleportable, what you need to do is define it as a collision. So the way we do this is we'll go back into our room. And let's see, models, floor, where is it now. This is a different project. That's why I forgot where things were, props OK, whatever, we'll just do it this way.

So what I'll do is I'll basically select the floor, right-click, and then just say create physics actor. And you can see it's already been done. Here it says Tron floor. I originally had just watched Tron when I was making this, the recent movie. And I totally loved the way it looked. And so I was doing a Tron glow floor. So if you're wondering where that is coming from, it's not here in this project. OK, so essentially, that's all you do. And remember, it's in the notes that I provided to you. So don't worry if you're not fully understanding how I got there.

So let's say I wanted to do the mezzanine. OK, go ahead and select that. There's the

mezzanine floor. Right-click, create physics actor, and that's OK. When you're doing VR, defining collisions for things like the walls or the stairs, it's kind of pointless. Even if I define the wall as collidable, it's not like it's going to physically stop me if I'm walking. Remember, I'm just walking around an empty space, like this desk will physically stop me. But what's in the virtual world will not.

So I mean, essentially, what's agreed upon it seems is that it's just you can go through it. So go to any VR world, if you could get close enough to the wall, you can actually just stick your head through it and see empty space or something like that. If I'm doing a basic project, so let's say something for a tablet, or just sitting here on the Windows without VR, yes, you really do need to do that wall so that the user doesn't just go through the wall and fall, OK?

Let's see. I'm going to skip ahead. So changing the spawn point and eye height, I'll just talk about it now I know I don't want to really show too much about it. It's in the notes. But if you wanted to change-- you're like, OK, how do I tell where do I start. I don't want them to start on the floor here. I want them to start upstairs. You can define that, or also the height. OK, so that's all done through, essentially, the programming that's in Stingray. Now, there's a few different ways to do that. We can use what's called Flow. But the actual language is Lua. It's a little bit like Python, we'll say.

So there's actually two ways to work with this. So this is a little bit like, let's say, a hypershade, if you've worked through it in Mac. So we'll just create the nodes, we'll say, whatever, input, touch, touch contacts, and then we just drag and drop to connect things together. The thing that's interesting is that, like I said it really is just snippets of Lua code. So for example, if I select this, and do Control+C, and go to my Notepad, and Control+V, just paste it, there is the actual code, OK? It's right there. So this is the nodes that we see here, are actually snippets of code. So I can actually copy and paste that. And if you have someone on your team, or you yourself, that are really into programming, you can go ahead and make your changes here, and actually copy and paste it back into the Flow editors that we have. So that's a cool aspect of the programming that's in there.

But Flow, for the novice, go ahead and use this. It is, I'll admit, very daunting at first. But once you get a few under your belt, it's really not that hard to do. It just looks daunting. But it's not too hard. And let's go ahead and do one right now. So like I said earlier, if I lose my RPC contents, how do I get some people in there. How do we do this? It's not a problem. We can do this. So let's see. Let me just get rid of the stuff that we don't want. Let's get rid of that. And

I think I actually have some of those things in there. So let's get rid of these.

OK, so if you want people-- me-- you should just use Populate in 3ds Max. This has been in 3ds Max for quite a while. And it allows you to create people. So it's the Populate tab. What you need to do is just go into the ribbon. So open up the ribbon, and you have Populate. So what I can do is I can create an animation. And this is done with Flows. So I can define an area that the people will walk in. So create Flow. It's not liking it. OK, what's going on here? Oh, there it is.

So I define a path for the people to walk in. So whatever, let's say something like that. Let's make this bigger so that we can see. So you can get an idea of what's going to be created by taking a look at these little squares with the line in it. OK, blue represents males. Red represents females. And you'll see the direction they're walking in. But if you actually want to see what they are, I'll click on Simulate. Sorry, little bit of jet lag here. And there they are. And they are walking.

OK, the number of frames that you see here define basically how long your animation will be. If you don't like it, you can re-simulate, have more people. It is possible to do some minor changes, we'll say. I could go ahead and, let's say, for example-- Oops, I want to create this. I could go, for example, select a few people, so I don't like this guy for some reason, go in, and then regenerate, which means it'll just create a whole new person. It'll take a bit of a few seconds to do. There it is. Or have a little bit of-- you can, for example, swap or not swap the appearance-- but there are some other ways to get a little bit more control. But you don't have full control. I can't say exactly who I want.

OK, the other thing we can do is create idle areas. So I don't want people walking through my loft. I just want them standing there. You could go ahead and do that here with the idle areas. So you draw an area, so either you can create a circle, or something a little bit more arbitrary, as you can see here. And again, what we'll do is simulate. And then, you have those people, as you can see here. And I'll go ahead and hit play.

So I could go ahead now and bring this into Revit. So like I said, I mean, I find this is already much better than what we have with RPC contents. So how do I bring this in? I'm going to just get rid of what I don't want. Let's actually keep the idle people. All right, or not, well, we need to do this.

All right, so what do we need to do is basically bake this. So we can't bring them in as is.

Because it's a populate unit. Now, baking, what it's doing is just that it's permanently creating the animations for these. I will not be able to just quickly regenerate, change the lady, change the guy, change his clothes. You're basically stuck with what you have. But that's fine, if you're happy with the results. So I'll select these people, bake selected, and in a visual way, it'll look the same to what you had before. Is it baked? Oh yeah, it is, OK.

So you can see what it consists of is the model itself, and, for those who have done character animation before, a skeleton. OK, because what we have, essentially, is a solid model. The skeleton is what defines how they bend. So once that's done, I don't need this Flow. And actually bringing in the Flow will cause problems with materials in Stingray. But once that's done, I just select them. Stingray, let me just make sure why I am in Stingray. That's OK. Stingray, Send Selection, whoops, contents. Don't need to be too picky at this point, but I will, people.

And when we go into Stingray now, what's really important is now we check mark this animation and skeleton. So it's really important that you check mark that. Everything else can remain the same. So import, again, you don't see it automatically. Let me wait for it to load. Or if not, you can crash the viewport. And I believe that's it. Drag and drop them in there. And now, in this case, I didn't build it in any specific place. So I mean, I can try zeroing it out. I think it should be somewhere. Close enough, but I'll have them outside the window. So if I bring them in there, well-- what happened? There they are.

Let's leave it the way it is, OK. I need a little bit farther from zero. But that's not important. So what I have here is I have the people. I have the skeleton. That's what this looks like. It looks like a rib cage. And I also have the animation clip itself. If you double-click on that, you can see them. I might have to move away, if they're not placed at zero. And if I play this, there's the animation that I have here. But I don't see it happening here at all. OK, so how do I actually animate these?

Now, we'll do a little bit of Level Flow. So what I'm going to do is I'm going to say-- again, in the notes that I've provided to you-- so I'm going to say when. Let's see. Event, level loaded, so when the level is loaded, I'm going to play an animation. So what I need to do is define which animation. So I'll open this up and it's people. Let's see people there, it should be this one. There is another one. But it's because I'm working on a premade project. And so I'll say, when the level is loaded, play the animation. But the last thing I need to do is say animation on what, so of the people units that I created. So this is data.

Let's see. Data level unit, select the unit, which is people. Whoops, connect that. So when the level is loaded, go ahead and play the animation for that, of those people. And let's take a look. Whoops, and there it is, OK? I'll get a little bit closer. But you can see they're moving. Materials, don't worry about that for now. OK, but that's essentially how Lua works, OK?

So it's all a bit daunting at first. But it really isn't that hard to do, once you get a little bit of practice in it. OK, and I think, yeah, so a lot of stuff, I understand. I know, but hopefully, you have an idea of what you can do, basically, with this WorkFlow. If you have any questions, I'll be here. Go ahead and feel free to ask. I also have, I mean, you can go ahead and leave. But for those of you who have a little bit of time, let's take a look at some demos, if you're interested, just to get a better idea of what you can do. What I had here was really simple, just so that we didn't spend like 10 minutes waiting for things to load. So let me open up some stuff.

So this was actually a demo made for an earlier AU. And this was a VR demo. But I'm basically just going to run it as, well, non-VR. Basically, I don't have the set up here.

AUDIENCE: [INAUDIBLE]

BEN BISARES: MBLs?

AUDIENCE: [INAUDIBLE]

BEN BISARES: I'm not sure what they're going to do with that at the moment. No, we'll say. I'm assuming because it's just costly. But we'll see. It would be nice, actually, to have this. So imagine I'm wearing a head-mounted display. It's great. This is essentially the starting menu. Now, I'm just using a mouse and keyboard. And what would happen is I can actually click to go into the actual game itself. So that's like the main menu. So what we have here is actually San Francisco and the Autodesk office that's around there, which is placed at my feet.

So I'm going to go a little bit further into it. So you can see-- whoa, went a bit too close. It's a bit touchy. It's normally not this touchy. But with the VR template, and the way I'm interacting with it, yeah, it's not the best. So if you click, we'll center in. Sorry, I don't want to make anyone sick. Let's go slowly. This apartment complex that you have here. So I'll go ahead and click on that. And now, we're at the apartment level. OK, so here's a fully created one. And like I said, I could walk around. Or what was created was essentially teleportation points. So I could go,

and click, and jump to different parts. So this allows me, like I said, if I'm on limited space, and I want to go outside, I could go ahead and-- whoops, that closed the blinds. But I could go, well, whatever. I'll just walk outside, in this case. But you can jump to different parts outside.

And again, when it comes to interactivity, so here's the one thing that's interesting. You can create, for example, for your clients, different setups. So I could go ahead and just change the arrangement of the furniture here. So if I don't like it, or they don't like it, you can give different suggestions, completely change the objects themselves. So they don't like this kitchen table, no problem. OK, we click. And it changes to something different. They want to take a look at the structure for those that are more like, let's say, the builders, you can remove a wall. And you can take a look at the internal structure. OK, so this is really the kind of interaction that you can create with, essentially, the log design WorkFlow. So it's quite interesting what you can do with that.

AUDIENCE: [INAUDIBLE]

BEN BISARES: All of the assets, I'm not 100% sure, to be honest. I mean, it was put together in Stingray. I never asked. I'll be honest. I mean, you can, obviously, do it in 3ds Max.

One other thing I want to show that could be of interest, for those who are using drone data, this is the Calaveras Dam project. OK, so it was done with photo scans of the dam. And this allows you to go ahead and walk on site, so just give it some time to load. So let me just jump straight into it. But that's not it. Demo five, I'm sorry, I think I overwrote my own thing here. Let's do that.

AUDIENCE: When you use the DirectX shaders, can you get decent still renders from those? Or is that really just for [INAUDIBLE]

BEN BISARES: I was actually asked this question yesterday. So, yeah, there was basically some people who were building their project in Stingray. And they thought they want to create stills and actual rendered movies from it, which, to be honest sounds funny to me. If you're going to do that, I mean, just do it in 3ds Max or Revit, like, why are you bringing it in to Stingray. Well, it is legitimate. I mean, it's fine. I can understand why you'd want to do it, but--

AUDIENCE: My question would be moreso, when you're just in Max, if you can get stills from Max.

BEN BISARES: You could.

AUDIENCE: And also be able to [INAUDIBLE] Does that make sense? So you don't have to recapture everything [INAUDIBLE]

BEN BISARES: OK, maybe, then I lost you. You're in Max, make stills. Actually, let's talk about this later. Let me just finish this, and then we can talk about it.

So basically, this was drone data that was brought in. And again, you can go ahead and navigate within this site. I mean, obviously, it's not going to be beautiful, when you're close up. But I mean, that's not the purpose. We're not trying to create a beautiful render, but more to get an idea of the site itself. So with your VR headset, I could go ahead and jump to different points, and get a feel of how it is. And in this case, for fun, it was actually some overhead shots. So there is these-- whoa, that didn't go where I wanted to-- balloons. I did jump to a strange place. That's kind of weird.

All right, let's try that one more time. All right, let's ignore them then. That didn't work out too well. But yes, I mean, so you can see the potential in this. And I mean, that's one of the things, I was asked a question like, who is this, who would you want to see this, presentation. Is it more for architects, more for people who are doing product design. And to be honest, for me, it was anyone. We really are at the cusp of something new and exciting that I find. I mean, I haven't essentially felt this way about any technology, since we went from like 2D pixels to 3D. That was like, wow, that's amazing.

And really, nothing has happened until now that gave me the same feeling. So it's more like I want to see what other people can do with this. I mean, just the potential then, what we can do is exciting. I mean, it's for architecture right now, at least. It feels like it's the right place. But who knows? Maybe someone will create something even more interesting to do with this technology.

OK, all right, thank you very much. So I'll be here for a bit, if you want we can have a little chat. If not, go ahead and meet me somewhere around the AU.