CHRIS MEDECK: All right, I think we're ready to start here. Everyone hear OK? They're going to be recording this class, so this will go down in infamy. If this is not looking familiar to you, you may be in the wrong class. If you are in the wrong class and stick around, you might learn something. This is Little Things in 3ds Max-- simple tips and tricks I've learned along the way.

Who the heck is this guy, Chris Medeck? I have had people at AU recognize the name just because of my activity on the AREA. A lot of people use fake names on there, I try to push out my real name. I have nothing to hide-- supposedly. I'm a Visualization Manager with AECOM-- AECOM being a really big company. I help manage a small team of visualizations specialists. Like I said, I've been on the AREA forums for a number of years.

I've been using 3ds Max since 3D Studio Max 2.5, circa 1998 is when I first started learning it. Recently accepted into the Autodesk Expert Elite program, it's Autodesk's way to recognize people who are active in the Autodesk community and give back and stuff.

This is my first time presenting at AU, so thank you and be patient.

[APPLAUSE]

The class summary-- I just want to show people little things that I've picked up along the way. They're all going to be there to improve your workflow and efficiency when using the software. It's a lot of shortcuts, or just functionality, things that have been in Max for a long time that maybe nobody taught you because they didn't know or they forgot about it. Maybe some of you used to know it and forgot it. So this is stuff that new users and veterans alike should be able to pull some useful information out of.

They make you put the key learning objectives. So hopefully you can better manage your scenes. Definitely you should be able to work more quickly and efficiently, because we all know time is money in our business. And then just have a better understanding of certain functionality in 3ds Max.

I'm going to be behind a laptop, unfortunately, there rest of the time here. So let's jump into 3D Max. Take that off so it doesn't hit the mic again.

The first thing I want to talk about-- when you first open up 3ds Max, sometimes you find yourself changing the render engine or changing the units. If you find yourself like changing

them to the same thing a lot, if you're always trying to get it over to feet and it always wants to go into inches or something like that, one of the easiest things to do is just open up Max, set your scene to whatever settings you want it to be, and then just save a file called max start dot max. And that's going to go into your default scenes folder, so it should drop in by default as your first choice. Once you have that max start dot max file created, every time you open up Max, it's going to load that as its template.

Which is a little bit different than actually using the templates in 3ds Max, I turned it off on this one, but you can create different templates depending on what kind of projects we're working on. We haven't done a lot with that yet, so I am not going to show you templates so much, I don't know enough about them myself.

But setting up that Max start file will set you up with all of your settings that you like right off the bat. You don't have to worry about accidentally starting a scene with the wrong system units or something like that.

Another thing you can do with the Max start file is actually create geometry or objects in that Max start scene, and when you open up Max it'll load those in. I used to save a daylight system in there, because I was always doing exterior renderings. I always had to create a daylight system, so I made a layer called "daylight", made the daylight system in there. Soon as I started up Max, it was already there. I didn't have to go through the time to do it all, so a little bit of a time saver.

The other nice thing with the Max start file is if you're working on a scene, and you want to start over, and you want to just clear it out, you can just close Max and reopen it. You can do File New or you can do Reset. Reset actually reloads that Max start scene rather than going just new, which goes to just plain defaults. So I find myself a lot of times going Reset. I don't like the way this is going, I want to start over, and it just starts you off with a new, fresh file with that Max start scene loaded in as a template.

Talking about the general interface here-- so I just open up Max, and I've got my perspective view up and it's full screen. I know a lot of people that just work in a single screen, and it bugs me because I'm more of this kind of guy where I've got four of them up there and I want to know what's going on at the view and the front view and the left view-- to switch that around, use Alt W, and wherever your cursor is, going to be your active viewport. Alt W just maximize whatever viewport is underneath your cursor, or-- if it's going to the yellow bar around it-- it's

currently It's a quick way to switch between your different views.

But in a really complex scene, sometimes when you do that Alt W it's got to redraw all of those viewports just to go over here and hit the top viewport. That can take time. This is something I recently discovered-- if you hold down the Windows key and hit Shift, you've got all your viewports right here. And I can either toggle Shift through to go through the different ones, or I can actually move the cursor around while I've got that Windows key pushed down and I can say-- Yep, go straight to the top viewport. It doesn't have to go to all of them and then maximize that one. So that one's really, really useful if you want to see-- I'm making a change in the top, I want to know what it looks like in the front. I can just cycle through-- OK, what's it look like from a camera? OK, that looks good, perfect, I like it.

When you do have multiple viewports, sometimes you're trying to align things but you want one viewport to be bigger than the rest. You can go over here to this toolbar and they've got the standard viewport layouts. And I can do something like this-- boom. So I've got my big perspective over here and then the little or top-front-left on the side.

But if I want that perspective to be a little bit smaller or bigger, if you let your cursor hover over the edge or a corner of where these viewports are, you see that the icon changes. Well, if you left-click and drag that, you can move that around. You can customize the size of all these windows in your viewport to however you want them to be and whatever's going to work best for you. And once you've monkeyed around with it and you go-- oh, man, I got to change this all back, you just right-click on there and it gives [INAUDIBLE] for a reset layout. And it just goes back to the default of that particular layout.

If you do find yourself changing the layout quite a bit, there is this little toolbar over here by default-- I forget what it's called. The viewport layer tabs ribbon here. If you load different ones out of this little flyout, it remembers the ones you've been using, and so you can easily just click on that to get back to the different layouts. If you accidentally-- lot of times I'll be working in a viewport and I've got my scene set up and I got my stuff in here and I've got this top just set up perfectly so I can see what's going on and I'm working over here and I accidentally-- whoops, oh gosh, how do I get that back? You know, I had the circle in there, I had the box. If you do Shift Z, it's going to undo any viewport changes.

Where this is really nice is if I isolate this box, it's going to automatically Zoom Extents to that isolated selection. I don't always like that. It'll go back once I end isolation, but if I want to get it

back before I end that isolation, I can just do Shift Z. And it'll undo that that Zoom Extents of the viewport.

Also, when you're importing objects, a lot of times it wants to zoom over to where those objects are. And depending on who built those objects you're importing, they're maybe a half a mile away from your origin and way far away from your model. So doing that Shift Z will let you know where that is in conjunction where your model is.

If you're in a perspective viewport and you go-- you know what, this is really composed nicely, I like the shot, I want to put a camera there. Just Control C, Control C will automatically create-- in this case-- a physical camera. Prior to Max 2016, it was just a standard camera. But it matches the field of view and everything of that perspective viewport.

Now, say for instance you don't want to use a physical camera, you're still working in the Stone Ages with the scanline renderer and just a regular old standard camera-- go back to your perspective view, create your camera just anywhere-- it's got to be a target camera-- and then in your perspective view do Control C. Now, it aligns it to that view. When we didn't have a camera selected, it actually changed the perspective view to that camera view. If you do it with the camera selected, it doesn't change the perspective view to the camera view, you've got to physically hit the C shortcut to change that perspective to camera there. So just a little bit of a distinction there.

Great way to just rough in some cameras if you've got your scene built up and you were just walking around in a perspective view and you go-- you know what, this is a good shot, I like this. Or if you want to just point out an issue to the designers of, there's some clash, or something like that, but you want to be able to get back to that same shot to see the results after they made changes-- just Control C to make a camera in there and you can easily get back to it.

I'll get back to this one a little bit later on, but I use my scroll wheel a lot to zoom in and out. Sometimes it just gets a little goofy and doesn't work anymore. That's OK, because the bracket keys will also zoom in and out. And if you move your cursor over to one side or another and hit the I key, it's going to shift your view to make that cursor centered. Very helpful in drawing complex splines. I'll show that a little bit later, when I'm talking about splines.

You saw me do this quad menu stuff a little bit. There's a ton of tools in these quads. And I even forget how many different quad minis are available to us because you just got the

standard right-click, you got Control right-click. This one I use a lot because it gives you quick access to a lot of the primitives. You can also change your transforms through the quad menu.

Alt right-click gives you some more transform, pose, coordinates, set keyframes, and Doshi Curve Editor. Shift gives you some snap options. But then you can start doing Control Alt right-click, and there you've got environment, exposure control, render message window-- you can just render right out of that. Control shift is massive facts-- or, I'm sorry, Shift Alt right-click is the mass effects.

But interestingly enough, if you do Control Shift right-click-- doesn't do anything. It's not because it's broken-- all of these quad menus are actually customizable. If you go up to your Customize menu into Customize User Interface, there's a tab here for quads. And you're most familiar with the default viewport quad but if you go down here, it shows you-- Shift right mouse button snap. And you've got an animation modeling, and mass effects.

Custom-- custom's empty. They actually left one of these quad minis open for you to put in whatever you want. And pretty much any of these commands in this gigantic list over here can be put into that quad. I used to work with groups a lot-- before I realized how evil they can be-- and so I made the Shift Control all of my group commands to group, ungroup, open, close. Because I got tired of going up to here all the time going doot doot doot doot doot. Anything that can save me from moving my mouse six to eight inches is definitely worth while.

But, yeah, the Control right-click to get those primitives up, I use that one daily. It's a good way to just start drawing a line.

Another thing with the quad menus this is kind of a neat little trick-- if I do Control right-click again-- yeah, you can kind of see it up there-- everything is gray text except the line, because that's the last command I did-- it's white. And in a lot of cases, you'll have four of these because it's a quad menu. In this case, I just have the two.

But if I want to repeat a command over and over again, I don't always have to go up through that list. Once something is highlighted, this little bar where it says Primitives, if I just click on that it's going to repeat that last command. And now I've got a spline selected and I right-click to get my quad menu. I've got a lot more options in here, because what's in the quad menus will change depending on what you have selected or what's going on in your scene.

If you've got an editable poly, you're going to have a lot of your Edit Poly commands at a right

mouse click through that quad menu. So if I were to go in here and say Refine, and click on that, and I want to do Refine again, I don't have to go down here, I can just click on that bar and it's going to Refine again. That's really nice for when you have some of these really long menus with the flyout here. If you're converting a bunch of stuff to editable poly through the quad menu, just clicking on that bar to repeat last is really a time-saver.

I'm going to open up the first scene here and show you another little-- no, we don't want to save. So this is just a really ugly, noisy scene. There's a lot going on and while you're looking at this it's sometimes difficult to tell which object is what. I run into stuff like this doing some roadways. So you've got a road and you've got your sloped terrain, its got a grass material on there, and it just starts really difficult to understand what object's what.

So what I've got is-- if I just go to wireframe here, you can see I've got a few planes. There are different colors on the wireframe, that's because I've got them under different layers, and each layer has it's own color. I've got these, if I look at the color swatch here it's black and white. That means I've got that set to By Layer.

So if I go to the Display tab here, and under Shaded you've got two radio buttons-- Object Color and Material Color. If I change that to Object Color-- unfortunately, that's how the scene came up, but what you're seeing is the wireframe color, but in a shaded mode. This is a great way to see visually what layers objects are on by their color. You know that your details layer is blue. Well, I can see that. I've got this MAX on that details layer. OK, so I know that's correct. It's a good way to check for clashes and stuff like that, and just reduce some of the visual noise of what's going on as you're dealing with your scene.

But another thing I like to use it for is if I know I've got to go in and fix something on a lot of geometry, I going to just grab everything. I'm going to click on the color-- I make it black. Now everything in my scene is black, and as I come in here and I make an edit, I want this to be a 12 foot by 12 foot plane. OK, that one's been edited, now I'm going to go back to By Layer. So now I know that green plane, I don't have to touch it, I've already fixed it.

So you can just go through and color-code things based on whether or not you fixed it or if it still needs to be fixed. And going into that shaded by Object Color will let you see at a glance where things still need to be worked on, but your material colors are still there, it's all there, it's going to render just fine, you're only playing around with the wire color. But how that is shown in the perspective or in the shaded viewport.

Next up, talk a little bit about modeling. So you saw me type in a new size for this particular plane here. Well, let's say I'm working with our compatriots in the UK and he tells me that plane needs to be six meters by six meters. Well, I'm clearly working in feet and inches.

So do I got to Google it? How much is six meters in inches? No, I can just type in the number six, the letter M-- for meters-- and hit Enter. Max is going to do unit conversions for you. You don't have to sit there with your slide ruler and try to figure things out and have Google open in a scientific calculator, no. Max understands units, and you can type them in and it's going to convert to whatever your current display units are. Great time-saver. Centimeters, meters, inches, feet, whatever you can throw at it, it's going to do that all automatically.

But what if you're dealing with-- we need to be 1/2 the length of this thing times 3, blah blah blah. Well, now I need my calculator, right? Well, if I've got one of these numeric fields highlighted, I can do Control N and bring up this little window-- Numerical Expression Evaluator, there's a fancy word for calculator. I use this one a lot too, because say I've got 144 and divide that by 3, and then I'm going to go plus 12. You can see my result here is 60. And I can just hit Paste or hit Enter and it's going to plot that into that field.

What if you're getting a little more complicated? So we'll do 60 to the power of 2 minus the square root of 144 plus pi. It gives me a value 3,591.14. It recognizes the little caret symbol to do to the power of. It recognizes square root. It recognizes pi. This is like a little scientific calculator built right in. You can do trigonometry right in there and it'll do the calculations for you. So if somebody gives you a whole bunch of stats and whatever you can use Max right here, plug that in.

And the nice thing is, once I've done that once, if I come in here and I do Control N again, it's going remember the last thing I put into that evaluator. So I can use that same value over and over again, or-- if I don't want to do plus pi this point-- I just want to do plus 10 or 50, you can change it a little bit here and there. Control N while you are in a numeric field.

When I'm using it the most time, though, is when somebody tells me-- I need an image at 36 inches wide, 24 inches high at 150 DPI. Ugh, math. Control N-- 36 times 150. OK, it's 5,400 pixels across, gotcha. That's where I use it the most these days. But very, very helpful.

Couple things with right-click. You know right-clicks bring up your quad menus, but something that most of you probably know but not everybody-- if I start a command-- and right now I'm just moving this out-- if I don't let go of my left mouse button, I can right-click and cancel that

command. I like to do that a lot when I want to see what's going on underneath something. I can pull it away and be like-- oh, OK. I can right-click and it just snaps back.

Object creation-- if I start making a box, and I haven't done that last click to finish that command, I can right-click and it just cancels it out. So if you ever find yourself accidentally moving something around, you can just right-click. Even just shift shifting a viewport-- right-click. As long as I don't finalize that command. It'll just undo it.

Another nice thing that the right-click will do is-- I see people doing this a lot-- I don't get that down. Well, you can drag your spinners if you want. But if you really want it to get down to zero, you can just right-click on that spinner-- it zeros it out. And that's pretty universal throughout Max. Anytime you've got a spinner on a value like this, you can right-click on it and it will either go to zero or as close to zero as it can. There's certain values that can't go to zero because it'll cause the universe to implode and we'll all be dead. So, yeah, right-clicking spinners-- the one time I use this the most is if somebody's got something built and it's way off in the middle of nowhere, I want that back to the origin, I can just go in here, right-click my absolute values, and make sure that thing is centered right at zero, zero, zero. It's the quickest, easiest way, because I don't have take my hand off the mouse.

I'm going to go ahead and clear this stuff out real quick.

I'm going to talk a little bit about drawing splines. Remember-- it's a Control right-click to bring up your primitives menu. You can start drawing a spline. And, like I mentioned, I'm drawing this and, oh, my scroll wheel stop working. I can hit the I key, it's going to recenter my view. If I want to zoom out or zoom out or zoom in that's the bracket keys, right next to the P.

But if I'm drawing my spline and I go-- whoa, I put that one way, way too high, and I've got like 50 more vertices I want to draw because I'm tracing on something, I'll remember to get back and move that one. Yeah, right. You have to. You don't have to cancel this command. You hit the backspace key, it's going remove the last vertex in your spline there.

And you can keep doing that all the way through until you've got your original vertex. You can't delete that one, at that point you might as well just right-click and cancel that command and start over. But, yeah, we've all done it, I'm sure, were your drawing something and you actually get that double click, you're like-- oh, shoot, I'll just backspace it, clear it out. No need to start over.

If you do need to start over, and you've drawn that spline and you're like-- oh, gosh, I kind of wanted to add more to this, there's a little check box here-- Start New Shape. If you uncheck that and start drawing again, it didn't de-select my original spline, because that's all part of the same shape now. And I just have to remember to come in here and grab my vertices, fuse them and weld them, and now it's a complete spline. I've used the-- unchecking that Start New Shape. If you are drawing a bunch of circles and you want them all to be one single object, just uncheck that and they all become the same spline object once you're done drawing them all.

And this one, too. This one used to get me all the time. I'm going to switch over to my top viewport here. Sometimes it's been imported geometry or line work, sometimes it's just I've been drawing it in Max, but I've got a bezier handle here that I've moved, but my segment didn't move. Well, that should be a curve now, shouldn't it? Well, yeah. Under this ruler here for interpolation, you've got Steps, Optimized, and Adaptive. Steps is the number of steps between vertices that it'll break up a segment to get a nice gentle curve.

Optimize will prevent it from subdividing between vertices on a straight line. But there is a certain threshold where it goes-- it's straight, it's straight, oop, now I'm going to be curved. Well, if you have this very gentle curve here and you need it to be that gentle curve, you can uncheck Optimize and it'll stop trying to flatten out that mild curve. One thing to keep in mind, though-- and I'll show you here by throwing out an extrude modifier-- you're going to get these flat segments with those six steps. So if I did Optimize, you notice it stops breaking up between the vertices along these straight lines. Without that, I am going to get that gentle curve, but everything's going to be broken up. So keep in mind it's going to add some face count to whatever you happen to be working with there.

Let's talk a little bit about modifiers and tools and transforms. Your basic transforms are Select and Move, Select and Rotate, Select and Scale. I don't like scale. You don't really ever want to scale anything at the object level, and I'm going to show you why.

So I've got two just rectangles here. On this one, I'm going to scale it just an arbitrary amount, but it's going to be bigger. And then I'm going to grab both of these guys and I'm going to come in here I'm going to say extrude them-- and that's way too high, let's just go with one foot.

Let me back up, I did the wrong scale. I'm going to do a full scale. That's better. And then we're going to extrude 12 inches.

So These have the same extrude modifier on it. This one is 12 inches high. This one is clearly more than 12 inches high. Well, if I look down here, that's because it's scaled up 205.457%. Because I scaled that rectangle at the base level, everything I put on top of that is going to be scaled as well. So even though I did a 12 inch-- one foot-- extrude, it's scaling that up to, like, 24 inches or a little bit more.

The same thing's going to happen if I put materials on there. If I put materials on there, which they be showing up. Ah, I unchecked that. OK. These both should have the same size, I'm using real-world coordinates on my checker map. These checkers should be the same size but they're not, because that UV mapping that's being generated is being scaled up too. So what do I do? How do I scale this thing up?

Let me just zero this guy back out and show you a couple of things, because we've got just a spline object here. We can add and edit spline, and then go to sub-object level and scale it there. And that's going to be fine because you're not actually changing the scale. You'll see down here here, it's a 100, 100, 100. That's OK, that extrude is going to come up and it's going to show me they're the same height and my material maps are OK.

If it's a little more complicated than that and going to a sub-object level isn't going to work, there's this nice little modifier called XForm. And if you go to the gizmo that you can kind of see it here, you can scale things at the gizmo level. And you can see in the lower-right there the values, you know, 65%, whatever. You can scale it up.

Now, things below that are going to be off. If we look at the material, yeah, the material is off because the mapping was underneath that XForm modifier. But I can add a new modifier for UVW mapping, and because that XForm modifier's kind of the container for that scale, I can add modifiers on top of this and the base scale's still the same, it's not going to change. So you can remap things and it's going to be fine.

A lot of times once I've done an XForm, I like to just collapse it to that XForm. You can right-click on that and just say Collapse To. And, yeah, that's fine. So now I've just got an editable mesh. Sometimes you might want to keep that editable underneath there, but just be mindful that people understand why that XForm modifier's there.

I'm going to open up another scene here and show you the Clone and Align. This one's really useful. So I've got these various little widgets. I've got this pink one and a bunch of green

ones. Somebody arrayed these out and they're copies, not instances. And I want to be able to change one, and they all change, so I want to make them all instances of this one. And there's a few scripts and stuff out there that will let you do that, or you can just do the Clone and Align.

Under Tools, Align, Clone and Align. I've got my base object selected already, destination objects, and I can either just pick them or Pick List. Pick List is probably quickest as long as you know what things are called. And I want to make sure that I'm instancing, I can align the position, rotation, match scale, everything. There we go.

Now you can see I've got pink ones and green ones all over, and I can just hit Apply. Now I've got pink ones and green ones. The pink ones are all instanced to that original one. What I can do to get rid of the green ones-- since I'm replacing them-- is under Edit, there's a Select Instances here, and that's going to select all the instances of whatever I had selected. So I can just hide those, and then grab these guys, delete them, and then unhide. So, quick way to just replace things. In this case, I was just making instances of them.

Maybe an updated model, you're trying to replace a Herman Miller chair with something else, Steelcase-- as long as the pivot points are the same, quick easy way to replace some geometry and get array back out. But in this case, what I've got is a little room. I'll show you from the side view here, I've got these light fixtures hanging down from the ceiling, and there's this weird slanted ceiling. And if I go to the top view, you can see these light fixtures are lined up nicely here, but it's a circle on this slant and it's just kind of awkward. And the architect gave this to me, he says-- well, put lights in each of those, because I want to see how the lights affect the walls and whatever.

OK, well, I can manually go in there and put a light at each of these and get it lined up with that light fixture. But I could just make a light object. I'm going to make a free light. What I want to do is I want to grab one of these Downlights here-- these are all instances, so I'm going to do Edit, Select Instances. And then I'm going to Control click to grab my light and I'm going to Isolate.

So now I've just got my light fixtures and my light object. I can come over here do Clone Align, pick List, grab all my Downlights. OK, so now it's going to put a light at each of those fixtures.

Well, that's not where the light goes, Max. Well, I've got offsets. I need to move that down-- whoops, that's kind of a big jump. If I come down 18 inches-- well, let's do 24. OK, yeah, that's closer. That's about where that should be. You can see it's a little bit off alignment there, so--

whoa, that is unfortunate.

Yeah, wow, weird. I've never had that happen before. Well, let's just fire that right back up.

AUDIENCE: Good thing we're recording this.

CHRIS MEDECK: Yeah, yeah.

But, yeah, when you do the Clone Align you can do offsets, you can rotate things based off of the original or a pivot point of whatever you're aligning it to. So that helps you move a light object to align with the light fixture. I've used it for furniture. The interior designers decided well, we need to have this wood rail on the armrest of this chair. And of course they're not instanced, so Clone Align, add that wood rail, worked out slick.

Let's wait for Max to start up here, should go pretty quick. All right.

Did a little work with the modifier stack. I'm going to show you a couple other things here. Draw a couple splines here. So I've got the rectangle, I've got a triangle. I'm going to throw an extrude modifier on here and extrude that up five feet. All right. Oh, jeez, I wanted to have that same one on here. Well, I can just drag, drop it, bop, perfect.

And if I want them to be actually instanced-- I want to be able to control the height of both of these-- I can grab this guy, just do Control right-click Copy. I can select this guy, right-click here, and say Paste Instanced. Now they'll both be affected as I change that value.

One thing-- if you've got a lot of objects that are instanced around and you start doing a lot of modifiers on them-- I'm going to take this, I'm going to bend it, and they're all going to bend. And then I've got another modifier up here, I'm going to do an Edit Poly, and grab a thing here and move it out. Well, pretty soon that starts to get really complex and I want to collapse that stack. Well, if I just say convert to Editable Poly, you can see it's not bold over here anymore, it's not instanced anymore.

So how do I collapse this stack without losing that instance? If you come up here and right-click, you get a lot of options in here and one of them is Collapse To. Well, now it's an editable poly but it's still bold, and so all of these still are instances of this original one. If I make a change to this guy, they're all going to change with it because I did that Collapse To. So that's nice to make sure that everything's still instanced and get rid of some of that noise and that information in that stack.

And it doesn't have to be the top modifier. If I just wanted to collapse it up to the bend, I can do Collapse To and it will remember that Edit Poly on top, it just flattens out everything underneath.

Another thing about instances-- if you ever clone anything, you've got Copy Instance and Reference. Look into References, it can be useful sometimes. But if you've got an instance, you can always change that to a reference version.

Nice thing with references is that you can add modifiers to it without affecting the original, but changes to the original will affect the reference. So I can add as many modifiers on top of this one without affecting the underlying instance of it. And it's just a simple right-click on the modifier stack to change that to Make Reference, as opposed to making from an instance.

The other thing-- and kind of an interesting thing-- you can change Off In Viewport and it'll still render. Or you can choose Off In Renderer and it'll show up in the viewport rather than just turning things on and off. So if you have a modifier, it's adding a bunch of polys to your object, just go ahead and say Off In Viewport and you'll still render with that on.

On to the next page. Oh, yeah, there's a little button up here-- Mirror. It's evil. They've somewhat fixed it. Somewhat, I say. But it used to just do a negative scale. And we all know scaling is bad. So if I have this object here and I do my scale, I've had this object mirrored. And if you look in the bottom here, it says negative 100. So it's been scaled.

If I hit the F12 key, that gives me my transform type in. I'm going to go ahead and use my rotate tool. Clearly this thing is not oriented correctly but it's telling me it is. It's saying it's zero zero zero. Well, I know this isn't. I can go over here, I can say the Affect Pivot Only, and, yeah, my pivot is pointed out all over the place. This is not right, because of that negative scale. If you ever have an object that you can't zero out the rotation on, it's probably got a negative scale on it.

Let me show you. I'm going to go ahead, I'm just going to say flip that back. And now if I come in here and do my rotation, you can see it's all goofy. And now I've got everything zeroed out. All because of that negative scale. It's not reading the absolute rotation of that object anymore. I've run into this occasionally.

So, mirroring-- hitting this button used to just automatically do that negative scale. You've got

options here, now. Transform or Geometry-- always choose Geometry because you see what happened over here, it added a mirror modifier, way nicer than just doing a negative scale. Doing it just by Transform, that's going to do that negative scale to things. You don't want to scale things, especially negatively.

If you do it Geometry, you can change the axis, whatever, hit OK, and it's right there. You can go back here and modify it. In the other case, you can't. You can't make any changes unless you start playing around with the scale. Doing it as a modifier allows you to easily undo it as well, just by removing that modifier.

Something I do fairly often is I can rename my modifiers. I can say Mirror-X. I know that's going to mirror in the x direction. You can go in and change the name of any of the modifiers you add on here. I don't recommend changing it too much from the original, because you may forget what it's doing there. But if I add an Edit Poly just to modify one thing temporarily, I'll just say Add a Poly-temp.

What I use it the most for is if I'm doing a complex material with several sets of UV mapping coordinates. If I'm making this one map channel 2, I'm just going to come here, say dash 2, and at a glance I know that's affecting map 2.

If you guys aren't using real-world mapping coordinates, I do recommend it for most cases. So I've got the sphere UV mapped, real-world map size. My checker map on there, each check is-- well, 12 inches by 12 inches is a 4 by 4 box or a 2 by 2 box. But if the client comes in and says-- well, we need to make that bigger, I don't need to adjust the UVW map. I need to adjust the map itself, because if I've got this material on 20 objects that are all UV mapped separately, if I'm not using the real-world coordinates, I'd have to go in and adjust all those UV maps or change the tiling in the map-- which you can do it and when it's nice numbers. Sometimes you start to get into some really weird numbers that it doesn't tile right and then it looks goofy and then you're remapping things and it's just starts getting messy.

The nice thing about this, too, is if they want to swap out this checker with a bitmap, and that bitmap is-- they know it's going to be a 4 foot by 4 foot sample-- carpet sample or something like that-- all I have to do is set that in the map. I can say give me a map, standard bitmap-- I don't have a map to throw in there now. But in that bitmap I can just say-- yeah, I know that is 48 inches by 48 inches.

And in that same material I could have another material, another bitmap in there that I know is

12 foot by 12 foot. All I need is one UV map, set their real-world map size, and it's going to map all those materials, all those maps, correctly on there. And I know I'm not going to have to go back in there and tweak anything, it's all handled by the material itself.

Be careful about mixing and matching units. Let me show you this. I'm going to do a quick little merge here. So my current scene was set to feet as a system units. I just brought in these two objects that were set to inches. You notice I've got this nice logo here and it's all tiled here. These are actually both the same material.

In fact, what I'm going to do is take and apply the materials that I've got in my original scene. So that one worked fine. But this one's still goofy. Well, because I got this UVW map on here. Now, with this sphere selected, you can see in here it's a 1 foot by 1 foot by 1 foot. This one, it's 1 inch by 1 inch by 1 inch.

Why is that? Well, the original scene it came out of was set to 1 inch. If I need to reset that I can just uncheck Real-World Map Size, check it again, and it's going to set its current scene.

In this case up here I've got no real-world map size on the object itself, but what I did do is set it in my map, I've got it set to 1 inch. Well, if you're not using the real-world mapping on your object, don't use it on your material. So if I uncheck this, it's set to tiling of 12, because of the conversion. If I just change it to one-- OK, now I've got it back to just a regular like this.

So be mindful if you are using real-world mapping. If you don't actually want it to use real-world mapping, don't set it to, you can run into some issues.

Getting low on time here.

I'm going to show you guys this one. So if you guys are not using the Slate Material Editor, I do highly recommend it. It's pretty useful, seeing your entire material at a glance. But it's got a drawback that I discovered, but there's a workaround.

So I've got this rainbow-colored object using five different materials, and I've got this one object that only has the green material applied. So if I come in here and I've got this green box-- I can see I've got little white around the green here-- if I say select my material-- oh, and now you're going to do it.

OK, for some reason that's not working right. Typically, when you do Select By Material-- it's grabbing them both now, it never does. There must be something going on with this scene

because when I tested this and created it, it didn't. We'll just pretend.

So it's only selecting the box colored, and not this object even though this object has that green material. Oh, I know why it's doing it, because I've got it loaded in here. Outsmarted myself. With the Compact Material Editor, if you Select From Scene by the material, if that material is part of a multi-sub material or a blend or something like that, it's going to grab all the objects that have that material applied, even if it's not just at the base.

So I'm going to just clear these two out, because that's my problem. Now if I select by this green-- still doing it, never mind. Anyway, if this was perfect world, this would have worked and you would have seen that if I wanted to grab this object-- because it's got the green on there-- I'd have to load this green material into the Compact Material Editor and select my material there. Of course it's not going to work for me.

But so Slate node-based editor-- right now I've got these collapsed down so you don't see all the options in there or whatever. But if I want to drop a-- if I want to drop a map in there, I can just click and hold somewhere on that material, and it's going to give me all of the available slots. And I'm going to say diffuse and just do checker in there.

I've got these actually set to hide the unused node slots, which really helps clean things up. So being able to click and hold and load something into there, this way makes it a lot quicker and a lot cleaner to do work with in Slate.

I do highly recommend having two monitors when you're working with Slate, because obviously I'm not seeing much of what's going on here and I'm not see much of what's going on here. If I could just slide this over, it makes way more sense.

Another thing with Slate is all of your maps over here by default they will show as icons and text, and you can see it's got to build all these icons, all the little previews. I don't really need to know, because half these just show black anyway. So one of the first things I do is just right-click on there, Display Group and Subgroups as Just Text. Just give me the text, do that for your materials too. If you do it just at the base of maps and base of materials, that's going to affect everything underneath.

The only place I'd like to see the thumbnails is under Scene Materials. But when you get a complex scene, I don't want to see all the material of my scene. I can just right-click on this and say Filter Selected Objects. Well, now I'm only going to see whatever material happens to

be applied to my currently selected object. In this case, since one of these materials is in a multi-sub object material is applied directly to another object, it's going to show up as a separate line item in there.

Organizing your materials with Slate-- this can get filled up pretty quick, so you can always right-click up here and say Create New View and give it whatever name you want. I can right-click on a material and say Move Tree to View Two, and it's out of this one-- no, it's in this one. But if I want it to be copied over there, I can always just [INAUDIBLE]-- I call this a little noodle-- I can click and drag that noodle over. And then like go over here instance, and I know this is an instanced material in multiple views because it's got a little gray bar through here.

We've got five minutes left here, so-- covered that. I'm going to go ahead and skip that. And we'll get to that.

If you're working with AutoCAD drawings and you're bringing in a lot of CAD linework, I do highly recommend not importing it but linking it. It's under the References, Manage Links. You can come in and the nice thing with linking AutoCAD plans is you can select which layers you actually want to include. And you can just skip all the frozen ones by default or you can select from the list. So if you know there's only a few things in there that you really want to pull through, you can just choose them and then select what you want, and then attach them.

The other thing is I intentionally built this weird little thing. These red pieces are blocks, and if I do a Select by Name, you're going to see that this linework is attached to this block object. Those block objects can get to be kind of annoying, we'll say, because this linework is attached to it. And because these are all instance blocks, just by moving this one, everything else is moving. Because this is linked, when I'm done with my linework, I can just break that link and it's gone.

But whatever information I actually want out of here, I can come in here and this is a linked piece of geometry, but I can add an edit spline to it, it's still a spline object. So if I wanted to just grab this spline, and I'm going to say detach all the way down here, and detach it, call it Shape One, sure. Go back to top level. Now I don't need that added spline on here anymore, I can move this piece out of the way. But I've still got my linework here, so as soon as I come in here and say detach that drawing-- yep, that's fine-- I still have my linework that I detached. So it's a really good way to just pick and choose what you want on that CAD drawing and then wipe everything else away, because whenever you linked is now gone. So you don't have all

those extra block objects and weird helpers and linework that you didn't know was half a mile away from the origin.

Yeah, we're pretty much at the hour here. I really didn't have a lot more to go over. So before we end, does anybody have any questions about anything we've been talking about? All right, well thank you very much for your time-- oop! You do have a question, yes?

AUDIENCE: [INAUDIBLE] bringing in the AutoCAD drawings, can you do the same in inventor mode?

CHRIS MEDECK: I don't know that Inventor comes in, I don't deal with it. You can do it with Revit models. Well, real quick, please do your feedback, do the class surveys. Like I said before, this is my first class, so if you think I did a good job, let them know, and maybe they'll invite me back to do it again. If you think it is a really bad job and you don't ever want to see me here, let them know and they'll kick me out.

And then just the other thing is at the Idea Exchange they're giving away Amazon gift cards and there's a GoPro sweepstakes. Check it out. You can do this one-on-one stuff with any managers, designers, researchers, and just kind of give your feedback about our Autodesk products, and you might get a little reward from there. Thank you very much for your time, appreciate it.

[APPLAUSE]