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GUEST SPEAKER: So I'm going to try to run through things pretty quickly, and if you don't have any sort of video experience or still photography experience, a lot of this will sound foreign to you. If you do, some of it will be very familiar. But either way, if what I'm saying is confusing because of the density of it, I would just sort of encourage you not to be too freaked out. Because the takeaways are actually fairly simple.

It's kind of like-- again, there's a lot of complicated technology and a lot of complicated technique, but the base is pretty simple. And what I'm going to do-- partly what I want to do today is just expose you to some concepts and terms that you actually may not have to really fully grasp or have mastery of in order to make your video. But it's worth it to at least kind of know what they are I think.

PROFESSOR: And I can condense my [INAUDIBLE].

GUEST SPEAKER: Yeah. But I do want to-- I'm very cognizant of not wanting to spend more than like 30 minutes. So can you tell me-- if I'm like maybe 10 to 2:00, just kind of give me a wave or something. And I'll condense even more.

OK. So visual language, there's sort of a question here-- what do we mean by visual language? Because it's kind of a contradiction in terms. Sometimes we think of language and the visual as being at odds with each other. We have text. We have speech. And we talk about, oh, well, we've got to make a visual. So what is a visual language?

It goes back to something that I talked about in the first class. And in some ways what I'm going to do today is try to build on some of those things as I sort of race through them. We have all of these plastic elements of film that we can manipulate. And today I'm going to focus on a handful of them, in particular camera. Because the camera is kind of the speech device that allows us to speak in this visual language.

And Elizabeth made a really interesting point, or quoted a very interesting kind of way of thinking about it, which was all of us understand this language better than any generation

that's ever lived, Because we just have consumed it our entire lives. But that doesn't mean we can speak it, and understanding that is a great first step in speaking it. But you really have to kind of unpack it and think about it consciously in order to be able to kind of reproduce it or change it and make it what you want it to be.

Anyway, so I'm going to race through some of these fairly quickly, focused mostly on camera, and I'm going to dispense with sound right away. Because I just want to say about sound-- don't dispense with it right away. Don't do what I'm doing. It is super, super important. I think I mentioned this the other day, getting good sound is absolutely critical. And sometimes sound can be more important than pitch and all this stuff I'm going to talk about.

It's also sort of the boring part sometimes. Well, you know, is the microphone close enough to me? I don't know. Who's listening to me? Am I OK? Good. All right, because it's really important. Because if you don't hear me-- or even if you can sort of hear me, but it's a camera mic and it's six feet away, there's a huge barrier between your audience and your material. So do not skimp on sound.

The environmental sound is important. It's important to be in a quiet room. It's important to have good mic placement. It's important not to have a signal be too soft or too loud. Listen with your ears. And then creatively you can do so much with sound too with music and sound effects. But I don't really have time to talk about that stuff.

PROFESSOR: I'll go over that stuff.

GUEST SPEAKER: Yeah. Yeah. OK, good. I just want to sort of make the pitch to not forget about sound in all of this. But let's go on and talk about camera. And I don't know if there are any theater people here, or people who have done theater, but I want to start with this concept of the proscenium. Film and video, film at least, has been around for over 100 years-- 125 years or something like that. The sort of first Edison experiments or the Lumiere brothers in France I think it was the late 19th century.

And for the first 20 years of the technology, the way people kind of accessed it or thought about it and the kinds of things that people did were based on theater. Because that, of course, is thousands of years old. In a theater, you sit in an audience, and there's a frame, which is the proscenium. And then stuff happens in the frame.

And a lot of the plastic elements that we ran through the other day are very, very relevant.

You've got lighting. You've got staging. You've got a frame, a sort of placement of people. You've got costumes. You've got sound effects, music even, all sorts of things-- very, very similar. But it all happens in this kind of static frame right there in the middle of your field of view.

And it was really literally about 20 years before people started going, oh, with a camera we can do something a little bit different than that. The first films-- and these were wildly popular films. It was already a big industry. Very quickly it turned into a major, major entertainment and communication industry.

But people would set up a camera, and then people would do their thing in front of the camera. And then they would project the thing, and people would be like, wow, this is really cool. This is like theater, except we can watch it again and again. And this is very relevant to educational video, because that is essentially what a lecture is. A lecture is a proscenium presentation of material.

And the question which you're asking yourselves in this class is-- OK, we've got that. We get that. When we watch media, whether it's online or on television or in a theater, obviously we have progressed way beyond that visually, in terms of visual language, and the tools and techniques that we use to do that are the things that you need to do in order to become conversant in this quote unquote "visual language," not just a consumer of it but a speaker of it.

So I'm going to go over something that is sort of like a convenient bucket to put things into, and it's also easy to remember. When I think about camera, I think about the four F's. And some of them are F because I make them be F. It just is easier.

So F-stop or exposure-- and if you know anything about photography or film, F-stop is the aperture of the camera lens, and you can let more or less light in. But what I mean by that actually is not just the F-stop or the exposure of the lens, but how you control the light. It could be lighting. It could be the shutter speed. There are a million different ways of controlling the exposure of what you're filming. The second thing is focus.

The first thing about focus is it's a good idea to have it. It's kind of one of those non-negotiable things. You really do want something to be in focus in your frame. Sometimes you might not, but it's better to do that in post. Always make sure something's in focus. You may be working with cameras that take care of this for you-- both of these-- the exposure and the focus. I'm

not sure. Is that true?

PROFESSOR: Yeah. So they're all working with the [INAUDIBLE] or your iPhones. The equipment that you guys will be working with, you won't have to necessarily-- it's not an element that you can control necessarily on the device itself.

GUEST SPEAKER: Or you can control it only by fooling the device, which is something you might want to do if you get more sort of comfortable with it.

PROFESSOR: To do focus on these cameras, you just literally touch the touchscreen with your finger where you want that to be in focus. And exposure, we're going to have to tweak with the external lighting and stuff.

GUEST SPEAKER: Yeah. Yeah. 99 times out of 100 it's pretty straightforward. And the auto systems on newer cameras are really pretty good about it. So I'm not going to spend a lot of time dwelling on that. But they're kind of non-negotiable. You want to get a good exposure, and you want to get something in focus. And 9 times out of 10 that something is someone's face, the person who you're filming-- not always but usually.

The third one is focal length. And that is basically how many millimeters you are shooting at from wide angle to telephoto. And you're not going to be changing lenses on the camera, but you can zoom in and out. Focal length is not the same thing as wide shot or close up. People often think that that's true, but it's not.

You can go completely wide angle on a camera, and then walk up-- I can walk right up to Elizabeth and get a close up. And similarly, I can go all the way telephoto and walk back 50 feet and get a wide shot. But they have very, very different kinds of resonances and feelings and emotions. So I'll try to talk a little bit about that in a minute. You might want to do everything at a very long lens. You might want to do everything at a wide angle. It will mean something different. It will feel different.

Framing-- this is the big one, and this is kind of like the catch all that I throw all of this sort of real thinking about visual language into. It's not just framing as I talked about the other day, like, oh, gee, do I center somebody? Do I put them on the right or on the left? It's the entire structure of your video. How am I going to shoot this? Where I'm going to put the camera? How is it going to edit together? Is the camera going to move? Is it not going to move? So framing is the big one, and that's mostly what I'm going to talk about today in that broader

context.

Quickly, so exposure-- just to get this out of the way-- this is what an aperture looks like and the lens. Again, it's automated for you. A big number means not a lot of light getting through, a little number means a lot of light is getting through. This affects the exposure in a way that I'm not going to get into. But basically you have a lot more depth of field, a lot more will be in focus the smaller the hole. Because the photons that get through are more directed, they're less scattered. And we talked about this.

Just as a sort of an example of classic elements of film-- so these are two stills from Science Out Loud videos. I think we saw a little bit of the Exoplanets video the other day. I don't know if you've seen this one on plants.

PROFESSOR: I think they did just a little bit.

GUEST SPEAKER: OK. What I thought was really interesting about these two frames is if I was storyboarding this, what would I draw? I would draw something like this-- medium shot, presenting to camera. But that doesn't capture anything about what is compelling about these shots. It's all the other stuff.

Here we are launching into space, deep space, to look at planets. And here we are-- bright, welcoming the world of plants. It's kind of an obvious point. But this tells us nothing about that, unless you then add a lot of other information. And that's kind of what storyboarding is about.

It's not just about what does my shot look like, but it's about-- what is all the stuff in the shot that's going to really make it compelling? And it's really a great moment to start thinking about locations-- a field of flowers. Wow. I guess I need a field of flowers. Where am I going to get that? Or what if everything was black? What if it's a black screen? And how are we going to shoot that?

Lighting-- I don't know if that's even an option here. I'm not going to go into it.

PROFESSOR: We have a light kit if people are interested in doing lighting. But come talk to either one of us during office hours or after class or something.

GUEST SPEAKER: The only thing I'm going to say about lighting is it's kind of like being a doctor, like, first do no harm. If you bring the lights out, and you don't know what you're doing, and you aren't trained on the kit, you can break the kit. You can hurt yourself or someone else, or you can ruin your

video.

On the other hand, it's really, really an important tool and something that-- you can't shoot certain kinds of things without some kind of lighting. I'm not necessarily recommending that you try to use artificial lights or become a lighting expert. It's a little beyond the scope.

But if there's something like-- to go back to this example-- you have to light to get a look like that. Some kind of lighting has to be done-- maybe not film lighting or video lighting, but some kind of lighting set up has to be created in order to get a look like that.

AUDIENCE: [INAUDIBLE].

GUEST SPEAKER: I'm sorry.

AUDIENCE: [INAUDIBLE].

PROFESSOR: [INAUDIBLE].

GUEST SPEAKER: Oh, you can improve it, but you have to begin with something that's been filmed with that intention.

PROFESSOR: If you have an effect that you want to do in your video, you can come talk to me about it. Because we achieve some of these things with jankier props. I've done-- I'm not proud to admit this in front of Chris.

GUEST SPEAKER: No, that's OK.

PROFESSOR: I've done a shoot--

GUEST SPEAKER: Oh, you don't even know janky till you've been on some of the shoots I've done.

PROFESSOR: I've done a few with desk lamps that I've covered with white tissue paper to help diffuse the light. You don't need a super fancy light kit to achieve some of the basics.

GUEST SPEAKER: No, absolutely. And that's exactly what I'm about to get into. To do sort of like a darkroom thing, you don't need a fancy video light kit, but you do need to light the person. And yeah, it could be a desk lamp with paper over it to sort of smooth it out, to diffuse the light, but you will need to do something. It's not going to just magically happen.

And that's the point of this-- lighting doesn't necessarily mean a video light kit. It means being

aware of the environment and the available light that you're shooting in and taking that into account either by manipulating that thing, like a light kit, or by taking advantage of the best light in the world, which is the sun.

So for example, if I was shooting in this room, and I didn't have any lights-- I might love the background out there. But shooting somebody in front of that window is not going to be possible if I want to get the background. Because by the time I expose for the person's face, the background is going to completely blown out. And if I expose for the background, the person is silhouetted. So unless I want that look, I really can't have it unless I bring in lights. And it would actually take quite a bit of lighting.

Fluorescents-- you can do a lot with fluorescent overheads. The difference between me standing here-- look at my face here, and look at my face here. Where do you want your person to stand? And you can manipulate that kind of thing even in a lab or a classroom or some other setting. You can make choices based on the available light or the ambient light that will help you.

And the other thing to think about in terms of exposure-- going back to exposure-- is what do I want to be properly exposed? In that face floating in blackness, the face is properly exposed. Everything else is very, very dark. But the face is properly exposed.

In the flower shot, the whole thing is properly exposed. It's more even lighting. There's some nice modeling on the face. But the whole point of that is that you want to see the environment, you want to see the flowers, you want to have this very vibrant, bright scene. So being very sensitive to the light that's available is part of lighting. It's not necessarily setting up a bunch of light stands and video lights and spending two hours when you should have been shooting your scene. Because it can also be very time consuming.

PROFESSOR: Just a quick tip on lighting-- since most of you will probably be filming indoors and relying a lot on fluorescent overhead lights, the only caveat to that is that oftentimes-- there are only two people in here-- but for me, the glasses is a big issue. You'll get like a weird shadow underneath on people's faces.

GUEST SPEAKER: Or a glare in the lens.

PROFESSOR: Yeah, or a glare. So you can compensate for that with maybe a desk lamp that's also shone on your face from a little bit below to hide some of those shadows.

GUEST SPEAKER: Particularly, as Elizabeth mentioned, if you diffuse that light with some kind of tissue or something in front of it-- because one thing about lighting-- the first do no harm-- when you're lighting faces, harsh, direct light, whether it's sunlight or desk lamps or video lights, are very unflattering. So that's absolutely a great tip. But I think it's always a good idea to sort of try to diffuse it. If it's not a hot light, you can put like a tissue or a white paper towel in front of it, and it will give this very nice soft light.

PROFESSOR: But if you're shooting something indoors, and you just feel like the person looks a little funky on the screen, it's probably because it's an overhead light that's casting shadow. So just experiment with a desk lamp or something.

GUEST SPEAKER: And I'm not going to go into focus too much. Because again, I know you're going to be working with autofocus. But just to say-- make sure that what you want to be in focus is in focus. There are all sorts of things you can do to mess with the depth of field, which is like how much of the plane of your image is in focus.

So if you have a very-- if you're very wide open, if there's not a lot of light, then suddenly you have very shallow focus. Which means that if you were filming me, my face might be in focus, and the background would be out of focus. If you are stopping way, way down because there's a ton of light, suddenly it's a very deep focus situation where everything's in focus. And that may or may not be a good thing.

You may not want more focus. There's something very nice about just what you want to be in focus and everything else being out of focus, because that makes people's eyes go to what you want them to see. It also creates depth in the frame.

PROFESSOR: Does everyone understand what depth of field in the frame means?

GUEST SPEAKER: Here I am. I don't know if you've seen this Science Out Loud video, Engineering Trash into Treasure. I won't show it. But it's got a really nice opening, which uses depth of field really effectively.

So this is a person talking about the creation of charcoal. And in the foreground are the props, and she's out of focus. And it's kind of counter-intuitive, because your presenter is out of focus and the props are in focus in the foreground. But it's actually quite engaging and interesting.

And then what they do-- and this is something that you will have a hard time doing if you are

just doing autofocus-- is they shift the focus to reveal her. And that's a reveal. That's something we talked about the other day.

Revealing things is part of the visual language that you want to think about-- whether it's a cut, with an edit, a change of the angle, a pan, a camera move. Revealing your next thing is really just kind of a key visual element. So here it's like the burning-- I forget what kind of--

PROFESSOR: Corn husks.

GUEST SPEAKER: Yeah. The burning corn husks come into frame, and then the charcoal comes into frame, and then the focus shifts and you reveal the person who's been talking to you. It's cool. It's quite a nice little opening.

PROFESSOR: It's really hard to achieve depth of field with these camcorders. One way you can sort of trick it is if you stand really far in front of your background. That's the closest way you're going to get that blurry background effect. So if you wanted to film in this classroom for instance, and you didn't want the stuff on the chalkboard to be really visible, you would have Chris move up all the way up to maybe where David is at least and then shoot from the very back of the room.

GUEST SPEAKER: Right. And so that's what this is. So again, you have a zoom lens. If you go all the way wide on the lens, you have much deeper focus than if you zoom all the way in. So if I walk up and shoot Elizabeth with a very wide angle, everything behind her will be in focus. If I go way back there, and I get the same kind of close up of Elizabeth with a longer part of the zoom, everything behind her will be out of focus. Which might be better if we don't care about the background, or if it's messy.

I've often been in labs that just look horrible. And the best way to handle that is to zoom way in, go way back, and have the background be way out of focus. Or you can, as Elizabeth mentioned, you can bring the person forward so that there's a lot of distance between the person and the background. So focus, focal length, all of these things relate to each other. And again, we're going to move a little quickly.

PROFESSOR: It's about 10 till.

GUEST SPEAKER: No, I'm doing fine, I think. I think I'm doing OK. This is an extreme wide angle. You can see how deep the focus is. It's infinity. And this is a telephoto, so it's a close up, but even the leaf behind the bird is out of focus.

Just a word about zooms-- so there are two kinds of zoom, and there's one kind of danger-- well, two kinds of danger actually. Optical zoom, which is if you zoom in and out with the zoom control on your camera. That is the way you change the focal length.

Then there's digital zoom, which is usually on these cameras-- I'm assuming these are like this. If you go past a certain point, you're not changing the lens anymore, you're just zooming in on the image itself digitally. The problem with that is that your resolution goes down immediately. It looks really bad. It starts to pixelate and just fall apart.

So I would recommend that you not use the digital zoom. It's kind one of those situations where people say, oh, well, when I can use it? I'm like, well, when the UFO is landing in Killian Court, and you're just too far away to get the shot, definitely use the digital zoom. But if you have time to do something different or plan a little differently then stick with the optical.

PROFESSOR:

And also realize that you can zoom in on a frame and post when you're editing. So it's generally better to just capture something wider. So say you want to do like a traditional interview set up, and you're not sure how close you should be into your subject. Go ahead and err on the side of zooming out as much as possible.

You can always play with how much you zoom when you're editing later. And the other thing about zooming-- maybe this is just a matter of personal preference. But generally, I don't like it when I see the camera zooming in live time. I prefer seeing just a clean cut from a wider angle to the zooming angle.

GUEST SPEAKER: And that's the other part of the danger for sure. Yeah. Zooms in general-- unless you're doing it because you know what you're doing-- all these rules are made to be broken. That's something I should mention right up front. They're often kind of the lazy person's way of doing something.

And in general, I would even go so far as to say even if you're not planning to show the zoom-- if I was, again, filming Elizabeth, and I wanted to get a wide shot, so I shoot her here. And then I want a close up. And I zoom in on Elizabeth, and I get the close up. There's something kind of unpleasing about going from a wide angle shot to a zoomed in telephoto shot of somebody.

The more sort of smart way to do it is to pick a focal length that makes Elizabeth look great and gives you what you want and then move the camera in. Don't change the focal length of the lens when you change the size of the shot. So maybe I end up on a medium shot, in terms

of the focal length. And then when I want to get the close up, I pick up the camera, and I walk in and get the close up. And that's going to cut better, it's going to look better, it's going to feel better. It's going to feel like just more controlled and like you sort of knew what you were doing. So zooms-- very useful, dangerous as well.

All right, so back to the proscenium. I just want to say a little bit about framing. What shots do you actually need to tell your story? Well, the way you figure that out is exactly the way you do it with animation or anything else, you do a storyboard.

And this is a storyboard I did a few years ago for a narrative scene. But you'll see it contains a lot of the things that we've talked about in this class. Who's our main character? This kid. How do we know that? Well, the next shot is a point of view of what this person is seeing.

There's a moving shot up, and the next thing that you see is his grandfather's reveal. You see what they're looking at. And only then do you actually see a wide shot, which is a home-built airplane being pushed down a field.

So this is kind of visual storytelling-- a very simple thing. Who's our character? What do they see? Who's around them? And then revealing the whole scene-- it could have been done completely differently. This could have been the first shot. It could have been-- let's establish the scene. Let's see all the people. Then let's kind of cut in and see our main character, or maybe it's revealed later.

There's no right or wrong answer here. But the point is is that what you want to do is think through your scene just as you do with animation. That whole process that Josh took you through is completely relevant to absolutely everything that you're going to shoot.

Just a few notes about what different shots do. Wide shots establish the location, the environment, the spatial relationships. They add production value. I don't know about you, but if I could go to the top of this bridge, I would shoot this shot. I wouldn't not, because this is awesome. And that's happened. I've seen that happen. People get an incredible location, an incredible view, and they don't get a shot that shows where they were. That's what we call production value.

Similarly, I think this is an awesome picture. This was actually taken in 1911. This is a pre-revolution Russian nobleman in a tiny village in Russia. It was taken in 1911. It's an amazing picture. But I would feel like I missed a huge amount if it was just his face. You learn so much

about the environment, you learn so much about the person, by having a wide shot.

If this was a video, I might want to also have a close up when I started to hear about him and learn about who he was. But boy, this is great. How could you miss that? So again, showing environments, getting production value, establishing characters and relationships, relationships and space.

Closer shots-- well, they kind of bring you into someone's world. They reveal details-- closer shots of a face, closer shots of what the person is looking at. If you're explaining something, obviously, really good close shots that show the angle, show from a good angle what you're trying to describe are very, very important.

So again, it's kind of obvious, but just make sure to get those as well. You want to get the wide shot. But if you're actually describing a process that's like a physical process that somebody is doing, make sure you document it well, and that you don't shoot it from the angle where the person's hand is covering the key thing. Just look at your frame and see if you're actually communicating what you want to communicate.

Moving shots-- endless kinds of moving shots. You can pan the camera on a tripod. You can walk with a camera. You can move on a dolly. They have all sorts of good great uses. They reveal story beats.

If, again, to keep picking on Elizabeth, if I want to introduce Elizabeth, and I dolly or pan over to Elizabeth, people want to know what the end of that shot is going to be. What am I going to see? Oh, this person, who's a character that I am supposed to pay attention to. Or you can follow a person, it creates a very strong point of view.

If someone's walking and talking and you're following them, then we pay attention to that person, because the camera is picking them out of the background to pay attention to. So that's part of this visual language. Similarly, we could do a point of view of that person's walking, and then we're suddenly into their world.

So kind of a classic situation is someone's walking, we're following them, and then you cut to the reverse, and you see what they see. And now we're in their head. So it's another great thing. And then there's just kind of the classic one of we have reptile brains-- this is the same reason we edit it quickly. Here's a new thing, you can either cut to a new thing, or you can pan or dolly to a new thing.

Let's see-- just a quick word about locations. You're going to talk about this too, but always scout your locations. It's smart producing, which Elizabeth is going to talk about, but it's also very smart creatively. I have been in so many situations where I've gone to a location a few days in advance, and I have completely rewritten my script based on the location.

Either because I saw a problem that I wasn't anticipating-- like a classic one is, OK, well, we're going to film all this stuff at the electron microscope, but there's a column here, and I can't shoot anything from this angle. Oh, shit. It's really good to find that out a few days in advance, because you can't move the microscope. So what are you going to do?

Or because the location is really cool, and there's amazing stuff. And you get very excited, because there's all sorts of possibilities that open up that you couldn't have ever imagined just sitting, doing your own story board in your room or writing your script. But suddenly because this place is amazing, you see all sorts of things that you could do.

So I always suggest trying to visit your location. One, for just kind of practical scouting reasons, like is there a chainsaw factory next door? But two, because it can completely affect your creative vision. And try to do it enough in advance so that you can incorporate what you learn.

So I'm going to just wrap up with a couple words about editing. This is where all of the stuff comes together and where you find out whether your plan worked-- your storyboard, your visual language, your script. And it's also where you fix all the things that didn't work. And I guarantee you that plenty of things will not work.

Just a word about pacing, B-roll, and transitions. So pacing is kind of like how much do I edit. And this is kind of the big question, like, gee, what's the big thing? What's the secret? What's my pacing? What should it be like? And I don't think there is an answer to this.

When I was in film school 20-plus years ago, I was being taught by people who were trained in the 1950s. And people who were trained in the 1950s would tell us, well, you really can't edit faster than four seconds per shot. Because the human brain just can't comprehend an image that lasts shorter than four seconds.

And I remember dutifully editing my very first piece and following that rule and watching it and going, this sucks. This is terrible. What's wrong with this? This is awful. And it's because four seconds is a really long time in some cases, in a lot of cases, in many cases, in most cases.

And that has increased-- has only increased.

My idea of a fast edit may be completely different than your idea of a fast edit because I'm older. I don't know. And there's also the difference between genres. I think Elizabeth mentioned this briefly, television-- there's this sort of like bombard everybody.

If you want to show an establishing shot of a house in a reality TV show, you can't just show one shot or two shots. You have to show eight shots. They're each 12 frames long, like, boom, boom, boom, boom, boom, with drums going. Just to make the reptile brain go, oh, yeah, this is important somehow. I don't know. And it gets kind of absurd at a certain point, and it can be, obviously, overediting.

But the more typical experience that people who are just starting out have is that they don't shoot enough, not that they shoot too much. You think, oh, I've got three shots, and this is going to cover like 30 seconds of my video. But 30 seconds can be an eternity. And if your shots aren't telling a story, that could be pretty skimpy.

Which brings us to B-roll, I'm going to talk about that in one second with an example. The other thing, though, to think about is transitions. How do I get from this to that? Obviously, you can just cut. But is there an issue-- like I'm cutting from a medium shot of Chris talking, talking, talking, to a medium shot of Elizabeth talking, talking, talking. That's not necessarily super compelling.

Do I need some other way of transitioning? Do I need a wide shot of the classroom? Do I need people listening? What other shots do I need to tell my story and to transition from scene to scene?

The B-roll I just wanted to mention. Have you guys talked about what that even means at all? OK. I was going to show this in the PowerPoint. But B-roll is a term that goes back, way, way back, like 80 years ago, when people edited on film.

The B-roll was the second roll of film that they would then composite over the first roll of film. And it was all the stuff that wasn't included in the sort of main narrative. And I'll show you what I mean in a minute.

This is just a little snippet from a video that we shot not too long ago with Jeff Hoffman, who's a professor here in AeroAstro, a former astronaut. And we had done a storyboard and kind of

a script plan. So we knew when he was going to be on camera and when not.

[VIDEO PLAYBACK]

-The design, construction, and operation of aerospace vehicles have allowed us to leave the surface of the earth and fly through our planet's atmosphere and out into space. I'm Jeff Hoffman. I'm a professor in the Department of Aero--

[END PLAYBACK]

GUEST SPEAKER: So anyway, we knew that he wasn't going to be on camera in the first part. So we were able to cut between takes. We didn't even bother to really have him be compelling on camera at that point. But here we knew he would be on camera, so we filmed him that way.

And the first string out is just literally putting together your script in a very linear way, the way you wrote it, without any kind of fancy stuff. And then I'll just show you what it looked like after. I'll just show the first 10 seconds, and then I'll be done.

[VIDEO PLAYBACK]

[MUSIC PLAYING]

-Commencing sequence start-- 6, 5, 4, 3, 2, 1, 0. All engines running. Lift off. We have a lift off. 32 minutes past the hour, lift off on Apollo 11.

-Have you ever wondered how rockets work? Have you ever looked out of the window of an airplane and wondered how something so big and heavy can actually fly? Have you ever wondered what happens to the human body in space, or how a spacesuit keeps astronauts alive and able to work in the vacuum of space?

These topics are all part of aerospace engineering. Aerospace engineering is giving humans the freedom to move in three dimensions. The design, construction, and operation of aerospace vehicles have allowed us to leave the surface of the earth and fly through our planet's atmosphere and out into space.

-Mission specialist Jeff Hoffman.

-Hello, Jeff?

-I'm Jeff Hoffman. I'm a professor in the Department of Aeronautics and Astronautics at MIT. Before coming to MIT, I spent 19 years at--

[END PLAYBACK]

GUEST SPEAKER: [AUDIO OUT] We were able to shoot with him very, very quickly, because we knew what we needed on camera. And we knew that we were going to be able to cover and fill and sort of explain things with other imagery. In this case, a lot of it's obviously archival stuff, but it could be stuff that we shot. And later in the video there is stuff that we shot, but it was all the same plan.

Anyway, I know that's a lot of stuff thrown at you, but I'm also cognizant of the time. So we can talk about this after class, too, if you would like. Thanks.

PROFESSOR: So just to give another example of B-roll maybe on a more likely level for you guys, because I assume you won't be going out into outer space.

GUEST SPEAKER: Well, neither did we. I called NASA. NASA is a great resource.

PROFESSOR: For Anastasia's video--

[VIDEO PLAYBACK]

-What do these awesome compounds have in common? They all come from plants!

[MUSIC PLAYING]

[END PLAYBACK]

PROFESSOR: You notice that she's not talking over any of it. We put the B-roll in because we needed to give the video a little bit of space to breathe. Otherwise it would have been just her talking constantly and saying facts. So we wanted to help with the pacing of the video, which is what Chris was talking about. So that's why we shot B-roll.

So if you're-- especially you, Paul, because I imagine you're going to shoot some stuff maybe with a boat, sort of like you have access to certain equipment. Whoever you're filming with, you're not only going to shoot, Paul, but I would also spend some time maybe just doing a pan of your environment, shooting some of the equipment that's around. It may not be super relevant to what you're talking about exactly in those moments, but you can always have that

footage to intersperse like we did here, if that makes sense.

And as Chris was saying, you're not always going to shoot B-roll yourself. NASA, I guess, is what you guys used. And all of their stuff is-- they're not copyrighted or licensed. So you can use that footage. There's a lot of-- there a lot of photos and pictures that you can look up. I'm going to talk a little bit more about music that you can use, and I can hit graphics as well next week during the editing lecture. But there are resources out there, if you want certain footage that you just can't shoot yourself.