

>> Deb Feickert: There we go. Human skull. This is the view you're seeing on the right-hand side of the diagram, page 26. And we're going to start and just move through some of these bones, looking for the structures listed. Then we'll take a little break [brief laughter], another break. And oh, I just want you all to know, by the way, sorry, I just want you all to know how proud I am that I figured out what's wrong without IT, because right, its 30 minutes later and they're still not here. So I'm just going to set the stand for a second, there's one other thing I need, and you'll understand why in a second. So this is my wooden shish kebab stick that I'm going to use to point items out to you because, of course, we don't want to mark on this very precious human skull. So yeah, thank you Vanessa. So this is what I'm going to use to point items out to you instead of a pen or a pencil, which is also what we would do if we were in lab, we would use our wooden shish kebab sticks. So the frontal bone is the bone of the forehead. We're seeing it here, frontal bone, bone at the forehead. And the only structure listed under the frontal bone is one of those concealed cavities called a sinus. And so I can't see that, right, from the outside of the bone in any way. The only way I can see a sinus is if I make a cut in the bone that is then opening the bone inwardly, so I can see this really large space called the sinus. This is the frontal sinus, this space that we're seeing. And you know about the sinuses if you suffered from any kind of allergies, right? The sinuses are lined with mucus membrane meant to cleanse and moisturize, warm the air as we breathe it in. But if I have a lot of allergies, it overproduces mucus and it can just be filled, and get a lot of pressure, right? So you go to the physician, they push here, push here. They say, "Does that hurt?" Yeah. It hurts; stop doing that, because it's filled with mucus. So frontal bone; now let me show it to you and I'm going to move back and forth between these bones. We're just going to put our precious skull over there and grab the disarticulated frontal zone, because what do we know, we need to see these bones, both articulated and disarticulated. And so here it is, this is a disarticulated frontal bone. And so you'll be able to find, those of you who have you Atlas, that have a textbook, you should be looking at the frontal bone page at this time, so that you can see what I'm seeing as I'm kind of manipulating the bone for you. And so as we're looking here at the frontal bone, let me just see if I can manage this light here so it's not that you don't get so much reflection. So as I tip the frontal bone, this is the anterior of the frontal bone. Because it's now disarticulated, I can see the space called the sinus, frontal sinus. So the frontal sinus is this concealed space, concealed cavity in the frontal bone. If I do a little tilt like this, a little less light, you're seeing the orbits, right, the poster of the orbit where my eye would reside. Frontal bone, frontal sinus. The next bone on our list is called the ethmoid bone. So the ethmoid bone, if we're looking at our articulated skull, we would have to look at the ethmoid bone. We can see it externally; I'll show it to you in a second. But the other way to see the ethmoid bone, because remember these bones are helping form the space called the cranial cavity for the brain. So like I said, I've taken – this is called, by the way, the skullcap. I've taken off the skull's cap. I'm looking inside. This is the frontal bone again. And I've seen some of the structures of the ethmoid bone. So the ethmoid bone sits

just posterior to the frontal bone. So I'm seeing some of the structures of the ethmoid bone here. I'm going to tilt, and then I'm going to work into the nasal cavity. And I'll see a couple more structures of the ethmoid bone in the nasal cavity. I'm seeing one here, right, this plate that we'll look at in a second. And I'm seeing these structures that are coming out of the sides of the nasal cavity. These are all part of the ethmoid bones. Now let me show you the ethmoid bone disarticulated. And we'll identify those structures. The ethmoid bone looks like – you should be following along, finding the ethmoid bone in your Atlas or your textbook. So this is what the ethmoid bone looks like. I got it just in this –

[Inaudible Comment]

>> Deb Feickert: Yeah. Yeah. Thank you so much. Thank you. Ethmoid bone, let me zoom in a little bit. Sorry. Sorry. Sorry. Adam. Adam. Sorry, sorry. There we go. I was moving over to say there was the IT guy, right? That was him, okay. All right, so let's flip that. Focus. And this is the ethmoid bone. So I'm looking at here from the superior. This would be anterior. This would be a lateral view. And this is a posterior view. So it sits, let me get my skull back, it sits in the skull right here, right in this position. And so let's move through the structures and look and see what they look like through there. Oh, I'm sorry. We'll go back to the occipital bone. I apologize. So my second, I have a group of sinuses again. What we're going to see is that we have four bones that have sinuses. And whenever I see the word sinus, it always means the same thing, concealed cavity. So in the ethmoid bone, it has multiple sinuses. All of these large spaces that we see all throughout the bone are all ethmoid sinuses. So it has multiple sinuses, the ethmoid bone. Again, we can't see them if the bone is articulated, they would be hidden within the bone. The next structure is called crista galli. So the crista galli is on the superior aspect to this bone. I'm going to turn it laterally. This is the crista galli. Crista galli means rooster's comb. So it looks like right that little floppy floppy thing on the top of the rooster's head, the rooster's comb. Where am I seeing it here? That's the structure I can see right here, right here on the interior of the skull. There is the crista galli. Next structure is cribriform plate. The word cribriform means sieve or colander, which is a strainer, like a spaghetti strainer. And the cribriform plates are bilateral. See all these little pinholes, those are all cribriform plate. So it looks like a strainer for spaghetti, the cribriform plate bilateral to the crista galli. When I'm seeing holes of any sort, it's because something is passing through them. So let me take this moment to point out to you that on the right-hand side of page 26, across away from cribriform plate, you're seeing in parentheses olfactory nerves. So when we see that on the right-hand side of the lab book, those are the soft tissue structures that are passing through those holes, or line within a particular passage way. Olfaction, what does olfactory mean? Go ahead, speak up, un-mute yourselves. Olfactory, what does it mean?

>> Smell.

>> Deb Feickert: No. So these are the holes – thank you. These are the holes for the olfactory nerves. So it's coming from my nasal cavity, right? What do

we already know? The ethmoid bone is partially in the nasal cavity, so that should make some sense. Move the cursor off there, sorry. Next on the list, perpendicular plate. So perpendicular, right, perpendicular to the floor, right at right angles to the floor. This long structure right in the middle of the bone on the inferior aspect is the perpendicular plate. Where else can I see it? That's what I saw when I looked inside of the skull, into the nasal cavity. Here is the perpendicular plate. And the perpendicular plate is going to be one of three structures that divide the nasal cavity into a right and left path, right? I have two nostrils, a right nostril and a left nostril. And they enter my nasal cavity in one of two halves, perpendicular plate. Superior nasal conchae, inferior or middle nasal conchae. So the word concha – so conchae, let's just remember this from now on, when I see one of these anatomical words, and it has an "e" at the end, that's plural. If I take the "e" off, it's singular. So concha means coiled shelf, kind of like a rounded bookshelf, if you will. And I'm going to actually look at the middle nasal conchae first. Perpendicular plate on both sides, the word is bilateral, on both sides, bilateral to the perpendicular plate, middle nasal conchae. And the middle nasal conchae actually travel all the way; it's still the middle nasal concha. Let me start here, middle nasal concha, middle nasal concha, middle nasal concha, all the way back. This is still middle nasal concha, but now I'm on the posterior of the bone, right? Here is my – right here is my little crista galli, that's anterior. This is the posterior of the bone. And these, see these little coil shells, they look round – looks like a little mouth on both sides, not as obvious on this side, but here my coiled shells. These are the superior nasal conchae. Superior nasal conchae will be seen posterior view only, disarticulated bone only. Posterior view only, disarticulated bone only. I'm going to go back to the anterior of this bone, perpendicular plate, middle nasal conchae. And when I go back to my nasal cavity, right, perpendicular plate, and then way up high here, these are the middle nasal conchae coming out from the sides. Now, some other conchae here, but those aren't part of the ethmoid bone. Middle nasal conchae up high, ethmoid bone. Okay, I'm sorry, I skipped all the excitement. Let's go to the occipital bone. After I just told you be organized. Okay. Sorry. Sorry about that. So the word occipital means base, base. It's the base of the skull. It is posterior and inferior. Let me show it to you on the articulated skull. I'm not able to find one because someone has stolen it from the box of bones that I have. So I'm going to go get it real quick, but I want to – so is my skull, anterior, pop, pop, pop, pop, pop, pop, pop, pop. Posterior of the skull. Find the occipital bone in your Atlas or your textbook. This is the occipital bone. It is the base – I'm going to turn it and stand in anatomical position, right? This is how it's sits. So it is posterior and inferior. This is the internal aspect of the occipital bone. And some of the structures are going to be found internally, and some of the structures are going to be found externally. So I'm going to go – I think I know where it is. I see a pile of bone, I'll be right back.

[Footsteps]

Found it. Okay. This is the occipital bone disarticulated. This is internal. This

is external. What I see here to help me identify is this huge hole that we're going to identify in a second. Let me do this, turn the skull, turn the skull. This is what I'm seeing. Occipital bone. So with that, let's go through the list. Occipital condyles, we said a condyle is a smooth round projection. We're finding this on the external aspect of the bone, and inferior. Meaning if this bone were in standard anatomical positioning, this is how it would be sitting. And so this is external and inferior. It's on the bottom of this bone. Let me turn it back so you can see the smooth round surfaces called occipital condyles. A condyle, just FYI, is almost always an area where the bone meets another bone, that is, forms joints in articulation. And these particular structures, occipital condyles, form joints with the first cervical vertebra, which is – so we could call it the first cervical vertebra, but it has a name, and that is Atlas, as in the Greek god Atlas. And so I'll put that together with the Atlas when we talk about the Atlas, so you can see that. This is where the skull meets the vertebral column of the occipital condyles. Next structure. Okay. What do we know? What is foramen? Every time, everyone, what is foramen? What am I looking for if I'm looking for a foramen?

>> Hole.

>> Deb Feickert: Hole.

>> Hole.

>> Hole [brief laughter]

>> Deb Feickert: Okay. Thank you. And magnum, what does that sound like? Magnum means what? If something is magnum, it's large. So here is the large hole, foramen magnum. Foramen magnum is the large hole. What passes through the large hole of the spinal cord? So this is where the brain meets the spinal cord, at the foramen magnum. And this is, if we go across, right, looking on page 26, go across foramen magnum, in parentheses we see spinal cord, soft tissue that passes through. Next on the list, hypoglossal canal. A canal is also a hole, but it's a hole that has a little curve to it internally. So it doesn't pass – nice and straight through. It has little curve. So the hypoglossal canal is just superior to my occipital condyles. So remember this, the standard anatomical position, I've tilted it, this right above it, superior hypoglossal canal. Is there one on the other side? Yes, there is. Yes, there is. Here is the other occipital condyle, hypoglossal canal. So that's where we're going to find it. That also tells me something's passing through it, hypoglossal nerves. Right and left, hypoglossal nerve is one of our cranial nerves that we'll discuss. So let me say this too, before we can finish up with the occipital bone. Why these soft tissues? Why? Because remember, anything on the page, we have to know. So for instance, in our lab practical, I have an arrow, I say name the opening, and you're going to say foramen magnum. Part B, what passes through this opening in life? And you're going to say spinal cord. Why are we looking at the soft tissues on the right hand side of the page? Because these are structures we're going to look at when we get to those systems. So that's

why we've chosen these particular openings and soft tissues. Transverse sulcus, a sulcus is a groove in a bone, and transverse means transverse plane. This is the – I think I might need to get myself a manicure later. Okay. Transverse sulcus, transverse plane, transverse, my hand is transfers, that is, parallel to the floor or the desktop. Here's my desktop. This is parallel transverse. This would be vertical, or this would be vertical. So transverse sulcus is a groove in the transverse plane, on the interior of the occipital bone. And here it is, transverse sulcus, interior. And look at the shape. It has that little groove, right? It's kind of like a dug out little ditch right there. And what makes sense that might sit there? A blood vessel would be that shape. And indeed, that's what sits there. It's called the transverse sinus vein. Lastly, posterior cranial fossa are also internal. A fossa – here's a new word. A fossa is a concave pocket, right? Concave pocket, like my hand right now is a concave pocket. Do I see a couple of concave pockets? Why, yes I do. Here are the posterior, right, posterior, at the back, cranial, they help make up the cranium fossa, concave pocket. To remember them later, we're going to say that they are just - here is my foramen magnum. That's a good thing to use as an identifier. We're going to say that the posterior cranial fossa, are superior and some like bilateral to the foramen magnum, right? Because this is standard anatomical position. So superior and they are interior. Beautiful. What am I seeing, right? One more time now. We're looking at – sorry, let me try it this way. We're looking at the occipital bone and all of the structures that we see that we just identified, that we can see it on the articulated, the articulated, occipital condyle, hypoglossal – sorry, hypoglossal canal, right there. Articulated skull, occipital bone. All right, I'm going to do one – we're going to go over one more bone and then we'll take a break, because it's a lot. But because we had a weird – because I had a weird start today, we're going to do one more bone before we stop. And the next one on the list is sphenoid bone. So let me show you the sphenoid bone, disarticulated. Find the sphenoid bone in whatever resources you're using today, so you can follow along, sphenoid bone. And please, everyone, as we're going through, if you have a question or want me to repeat something, I'm happy to do that for you. Don't hesitate to unmute and ask a question, okay? So here is the sphenoid bone. This is where it's located in the skull. Here's the frontal bone. Here's that ethmoid bone. And here and here is the sphenoid bone. I'm going to set it on top. This is its location, sphenoid bone. So let's look at it disarticulated, and then we'll look at those structures articulated. So with the sphenoid bone, kind of looks like a bat or a butterfly. It's often described as that, bat or butterfly. We have our third sinus, concealed cavity. This is how it sits. If you're in standard anatomical position, your eyes are staring straight ahead right now, and then look at the screen; this is how the sphenoid bone sits in your cranium. This is anterior. This is posterior. This is superior. And I'm going to flip it. This is inferior. So this is how it sits in your head. Sphenoid sinus is on the anterior aspect of this bone. So I'm going to tilt it to see anterior. And these spaces that have been revealed to me are sphenoid sinus, here and here. Sphenoid sinus. I don't know if there's a sphenoid bone. Let me see if I can show you a bit more sinus on it. Oh yeah. Okay. Still a sphenoid

bone, tilting anterior, you can see a bit more of the space that would be called the sinus, sphenoid sinus here. After sphenoid sinus, greater and lesser wings. So I have – this bone has a lot of wings on it. Looks like a bunch of wings. Greater means big, lesser means small. We love that. So the greater wings are these big wings that I'm holding onto right here. These are the greater wings, greater wing, greater wing. Lesser wings are superior to that. These are the lesser wings. Lesser wings, different angle, well, see how it looks like a wing? Ooh, lesser wings, greater wings, on the sphenoid bone. But we have another set of wings, gosh, darn it, called the pterygoid processes. So the P is silent. Pterygoid as in pterodactyl, the flying dinosaur, right, the cool dinosaur, pterodactyl, pterygoid processes are inferior. So they're these wings. They look like wings as well. Pterygoid processes. They are on the inferior aspect of the bone. Pterygoid processes. Try a different angle. Pterygoid processes inferior. And then we have some foramen. And just so you know, I just want you to know, I used the word foramen as its spelled here for both singular and plural. But the true plural form of foramen is foramina, I-N-A. I don't know. I don't like it, so I'm just using foramen both singular and plural, FYI. So foramen ovale is telling you its shape. I'm looking for an oval shaped hole. And I find the foramen ovale on the poster aspect of the greater wing, shaped like an oval, foramen ovale. This is, again, anterior. This is posterior. These are the greater wings. Posterior of the greater wings. Foramen ovale. Foramen rotundum, the word rotundum means round, the foramen rotundum are also on the greater wings. I'm going to tilt the bone. And now I see these round holes on the anterior of the greater wings. Those are the foramen rotundum. Foramen rotundum are round, foramen ovale are oval. And passing through them, another couple of our cranial nerves that we'll be discussing later in the semester. Sella turcica, the two words, sella turcica mean Turkish saddle, like a horse's saddle. The sella turcica is posterior to the lesser wings. And it's this indentation. Let me show it to you from the side. It looks a bit like a saddle. I guess it looks like a Turkish saddle. Although I don't think I've ever seen a Turkish saddle. I should look that up. I've only taught this class for 130 years. You'd think I'd look that it before. It just now occurred to me. All right, sella turcica, just posterior to the lesser wings, lesser wings. And so that space or that indentation houses a structure, that's why it's there. It houses a super important structure. Oh, they're all important. But one of my favorites, an endocrine gland and your pituitary gland sits in the sella turcica. Superior orbital fissure, so I've got a couple of words that I'm going to define now, right? Orbital has to do with the orbit, so hold on. Remember what the orbit is. The orbit is the eye socket. So anytime we see the word orbit or orbital, it's referring to the eye socket. Superior orbital fissure, a fissure is a crack in the bone. It's like a long, thin crack. So it's an opening, but it's not round like a hole. The superior orbital fissure is going to be found between the greater wings and the lesser wings. So if I tilt, I'm going to see a crack in between the lesser and greater wings. Superior orbital fissure. And because it is something I should be able to see in the orbit, let's look. Here's the orbit. And right back here is the superior orbital fissure, the crack in the – a superior crack in the orbit. Why

is it called superior orbital fissure? Because we're also going to see an inferior orbital fissure later. Okay. So here it is from the posterior, here it is from the anterior, superior orbital fissure, between the greater and lesser wings. And there's a lot of stuff on this one. Lastly, optic foramen. Optic has to do with seeing, the eye. So let's say this before we look at it. On the right hand side of the page, this is good, I like it. What passes through it, same word, optic nerve. The optic nerve is the cranial nerve, the cranial nerve, if you're counting one to 12, cranial nerve number two that passes out of the back of your eye, taking information about vision and allowing for the movement of your eye, back to the occipital lobe of your brain. So this hole allows for the passage of the optic nerve. Where do we see it? It is just - I'm going to turn posterior. Here are my lesser wings. It is just inferior to the lesser wings. One here, one here, because I have two eyes. And I'm going to show - let me show you this. Oh love it so much. Hold on. Got to get another shish kebab stick. Hold on. Don't go anywhere, I think [inaudible] okay. Coming back. Optic nerve, passing through that optic foramen. Optic nerve - look what happens, so cool. The optic nerves cross. So the optic nerve from the right eye goes to the left side of the occipital lobe, from left eye goes to the right side of the occipital. I love that so much. We'll see that when we see the optic nerve in a bit down the road. Fabulous. Where do I see it here, right? You should be able to see it through the actual passageway of the orbit. And here it is, its right there. So then - that's better. There is the optic foramen, so that the optic nerve at the back of the eye can pass through it. Here it is internally, inferior to the lesser wings. Love it so much. Okay. This is a good place for a 10 minuter. So take about 10 minutes. I'm going to reorganize some things, because I've got piles and piles of books and bones, and we'll be back in 10. If you have any questions, let's start those - let's start with those after the break. Okay. Enjoy. Have a good break. And move onto our next bone. And we are going to, just today, look at the bones of the cranium, the cranial bones. So we just have two more bones to look at. And we'll pick up from there next week because this is a lot. And we need to just have time, of course, on all of these, just look at them and study. And I will also say that now that - sorry, and I'll put that, our next bone is the parietal bones. Let me put that in front of you while I'm chit-chatting. Now that I am in the lab and sharing that space with the other instructors, we will be finishing most days by about 10:30 or so maybe a few minutes after, because professor Fredette [phonetic] needs her amount of time to get in and organize. And it takes about 30 minutes, because - and her class starts at 11:00. So we are sharing lab space and sharing our time with other classes. That's okay. We're remembering that we are studying outside of class as well. And after we do initial description of these bones, we'll have a lot of time to just study. So keep that in mind. Okay, so parietal, the word parietal, we've seen word parietal before. We've seen that with serous membranes, if you remember. Serous membranes are double layered membranes found in closed cavities, and they are always two layers. There's a parietal layer and a visceral layer. And we said that the word parietal, we'll review for tests on Tuesday. And I also want to give you time to ask some questions before we before we sign off today, about your test on Tuesday. And

the word parietal means wall, W-A-L-L. Wall, meaning the wall of the cavity, that's the layer that's attached to the wall. And the parietal bone forms the lateral walls of the skull. So this is the parietal bone disarticulated. Let's put this skull in our view. I'm going to re-attach the skullcap -- to show you the parietal bone articulated. I'm just being very careful, everyone, because this is, as I told you, human bone. It's quite precious. We can't get bones that are human bone, and rightly so anymore. They used to be, we could actually get human skeletons. And since we don't get human bone anymore, the ones that we have, we're very, very precious and careful with. So here's our skull. All right, reconfigure anterior view; put this up a bit, anterior view. Like so. There it goes. Lateral view. I'm just going to hold this. So lateral view is showing you the lateral walls of the skull -- which we're seeing here. So frontal bone and then parietal bones lateral walls of the skull. And what we're seeing with the parietal bones is the formation of all of our major, what we call sutures. So a suture is a type of joints, but a suture is a specific type of joint where the bones are tightly touching and held together. And in a child, in a not fully formed human, these are held together with a fibrous connective tissue, dense, regular within our connective tissue. But as we mature and our skull grows and develops, the sutures are connected by a bone, connected tissue. So on the parietal bone; we can see our major sutures because the parietal bone forms the major sutures with the other bones of the cranium. So we see coronal suture, coronal means coronal plane, right? Here's my coronal plane. Here's my frontal bone. We could also call that the frontal plane. So coronal suture is here. I have sagittal suture. Sagittal as in mid sagittal cut. This is the sagittal suture, divides my skull into a right and left half. Lambdoidal, two Ds. The word lambda identifies the Greek letter lambda, which looks like an upside down Y. The lambdoidal suture is posterior, and is formed with the, again, probably parietal bones and the occipital bone, posterior. And the last major suture, we're going to go lateral. It's called squamosal. We've seen the word squamous before, means flat. And so the flat squamous suture is where the parietal bones meet our next bone, temporal bones. And they are lateral. So those are the sutures of the skull. But how else might we have to identify the sutures? We have to identify the sutures just by looking at the parietal bone. So and as true, by the way, let's say for the first time here, it's not listed but I want to make a little note, that we have to know -- and Amy, are you looking at textbook or the lab Atlas for the parietal bone. Which one? Either? Okay, let me look. I have the Atlas. Let me see. Remember that not all of the bones are featured in the Atlas, so it's very possible that, yeah, the parietal bone is not found in the Atlas. So I'm going to say it would have to be in the textbook. Hold on one second. I'm going to my bookcase. If someone finds it in the meantime, put it up for us. I'll look really quickly in the textbook to see if I can find it for you. May not be there either, you never know. That's okay, because I'm recording. So it will be all right. Frontal bone. And thank you for following along Amy. I really appreciate that. Fantastic. Yeah. Wait, still looking -- oh, check page -- and at the eighth edition, Amy. I have 143 -- oh, 157 in the textbook. Okay. So that's in the -- thank you Amber, thank you jazz. Yes. That's in the ninth

edition of the textbook. Thank you. Excellent. So parietal bone – thank you for assisting your classmates, everyone. Parietal bone disarticulated, what am I going to figure out about it, to figure out where the sutures are? And let me say this because some of you have already asked me this. If we were in lab and actually handling bones, and able to do the things I'm doing with the bones like this, one of the things you would have to know about the bones is, is it a right or left bone? It's very difficult to identify that if you can't hold the bone. So if I would ask you to know right or left, so I'm going to point out which bones and why I would ask you that you should know. But it certainly won't be all of the bones as it normally would in lab, because it's a very difficult thing to picture. But we do need to know how the bones articulate with other bones. And so if we see a disarticulated bone, we should be able to say which bone articulates at this point, and/or what sutures form. What bone articulates at this point, what suture is formed? What bone articulates here and here. So if I were to show you a parietal bone, this is what you're looking for to help you identify it, right? It's looking kind of tilted side to side. This is external. Let me show you internal. Get a little bit better view of the shape of the bone internally. And we can see the bone is pretty much almost cube shaped, until we get to this structure, this kind of sharp pointed part of the bone. And this sharp pointed process is on the inferior and anterior position of the bone. Meaning if it were in standard anatomical position, it would sit like this. Let me bring the skull over. Here's the skull. Here's the parietal bone. The bone would sit like this. Like this. That's not working. Like this. And so I'm going to turn it so you can see, that sharp point is anterior, here's the face, and inferior on the bone. This is the superior of the bone, at the top of the skull, inferior to the bone at the bottom of the skull. So that sharp projection, let me move my skull back, is going to help me identify what I'm looking at. So this is anterior. This is the frontal or coronal suture. If it's inferior, this is the squamosal suture. On the opposite side of the front is the back, lambdoidal suture. And at the top, right, turn it again for you, here's the point, inferior. So the opposite of that is superior. Here's the sagittal suture. Let me turn it this way because it's easier to see the shape. Here's that sharp point. Anterior, inferior. Anterior coronal suture. Superior sagittal suture. Posterior lambdoidal suture. Inferior squamosal suture. And that's all in reference to this sharp point, which is inferior and anterior. This is an internal view of that bone. And lastly, our last bone today, the temporal bone. Take a look at it. Looks like this. There's my temporal bone. I'll zoom on it in a second. I'm going to show you the skull first. Where's that temporal bone? The temporal bone is the bone – it's going to be bilateral. It's the bone underneath the ear. So this is the temporal bone right here that we're seeing here. So here is the parietal bone. Here's the squamosal suture. And it forms that suture with the temporal bone, which is the bone that is deep to the ear. And so as I'm looking at the full skull, how might I identify it that looks like, right, stick your finger in your ear right now. That's it. We're going to identify it in a second. This is the temporal bone. So now let's look at it. I'm going to hold it up like I've been doing. Here's that bone. Here's that bone. It's like magic. Here's that bone. All right, I'm going to put this aside and start

naming these structures for you on the temporal bone. All right, so in order; internal auditory meatus. The word meatus means an entrance into a bone. And a meatus does not necessarily go all the way through the bone. It's just an entrance into the bone. This is external. This is the external bone. We see this – we're going to get to this in a second. We see this large opening and we know that's external. That's what we stuck our finger in our ear. So we're going to go internal. Internal of this bone, meatus this opening. So the internal auditory meatus is found on the internal of the bone. It's a passageway into the bone, but it does not, you can see, it doesn't go all the way through. The internal auditory meatus, internal and external auditory meatus do not connect. And this is the internal auditory meatus. So sort of like the internal auditory meatus, what is it telling me? What's going to pass into this? The auditory nerves, right? This is the – over the ear, so we're going to have a lot of information about hearing at this bone. External auditory meatus, you already guessed it. External, auditory means hearing, entrance into the bone, external auditory meatus, right? What is that opening for? Sound waves to pass into my ear. I have a jugular fossa and a jugular foramen. So I want you to write a little side note here. It's going to be important. A fossa, we've already identified, is a concave pocket. A foramen is a hole. The jugular foramen, I'll say this more than once, the jugular foramen is formed when the temporal bone articulates with the occipital bone. Jugular foramen is formed, that is that hole, is not a hole until the temporal bone articulates with the occipital bone. So the point of that note is that we won't see the jugular foramen on a disarticulated temporal bone. Then the only place we'll see the jugular foramen is on an articulated skull. So let's start with the fossa, which we can see on a disarticulated bone, and then we'll look at the foramen. We are going to use another structure several times on this bone, to help us find other structures. And so I am going to skip down a couple of bullets to the styloid process. The word styloid means needle-like. It's going to be sharp pointed. Here is the sharp pointed styloid process on the temporal bone. I'm going to remember it. I'm going to love it forevermore because I'm going to find other structures close to it. The jugular fossa is going to be – so I'm looking external. I'm going to turn the bone so that I'm looking inferior. And the jugular fossa – let me give you the angle that you can still see the styloid process. The jugular fossa, the pocket, the concave pocket is just medial to, meaning toward the midline of the body, the styloid process. So this pocket, this little shallow pocket – let me turn it so you can see, here's the styloid process. This is external. This is internal. That means we're moving medially, toward the midline of the body. This would be the jugular fossa. And then the jugular foramen is going to be just medial again to the fossa on the articulated skull. Turn it like this. Turn it like so. The styloid processes cracked off. They would be here. Jugular fossa is this pocket here. And when we medial again, we see this large hole jugular foramen. And the only reason that hole is there is because I now have the occipital bone articulating with the temporal bone. I can also see this foramen from the internal aspect of the skull. So I open up the skull. Here is the temporal bone. Here's the occipital bone. Here's the jugular foramen. The only

reason it's there is because I now have these two buttons articulating. Okay, next, carotid canal. So jugular, by the way, you know what that is, jugular vein, that's what lies in the fossa and passes through that hole. Carotid, you know what that is, carotid artery. So the carotid canal, remember what a canal is, we've already seen a canal, the hypoglossal canal. Canal is a hole; it is a passageway that it has a little curve. So it doesn't pass straight through. Let me use the styloid process again. The carotid canal, the passageway, the opening of the hole is just anterior, this direction, in front of the styloid process. I'm going to go underneath. And just anterior is this passageway. Go like this for you. let me get that stick out of there and put in something, another little tube in. That's the carotid canal. From the internal, and external, using the styloid process to assist us. This is how the bone sits in my skull. So I can see where that passageway is located. Let me turn it again. Inferior. Styloid process. Internal. Carotid canal. Next. Mastoid process. We go external. I'm going to use my styloid process. Thank goodness it's there. The word mastoid means breast, like a chicken breast. This frown process that looks like a chicken breast, posterior on this bone, this is the mastoid process. Posterior, posterior aspect of this bone. Zygo – excuse me. Stylomastoid foramen. Styloid process, mastoid process, stylomastoid foramen is a hole right in between the two. Like this tiny teeny hole right there. Stylomastoid foramen, inferior. Inferior aspect of the bone, between the two processes. What a cutie. Ear ossicles. Teeny tiny ear ossicles on the interior of the bone. We can't see them unless we crack the bone open and look at the bones outside of the temporal bone. So here are my teeny tiny ear ossicles called the malleus, incus and stapes. Now, they articulate with each other, now this incus and stapes, they're found in what's called the middle ear. And they are transporting and amplifying sound waves toward the inner ear. You would want to know them by their shape when see them by themselves and without an indicator of their name. Malleus like a mallet, incus, this is an anvil, if you know what that is, state mean stirrup. Malleus, incus, stapes from lateral, middle, medial in the middle ear. Ear ossicles. Almost done. Zygomatic process. Zygomatic process – remember what a process is. It could be a sharp point, styloid process, or a thin extension. And this right here is the zygomatic process. It is pointing anteriorly. And it's pointing anteriorly, and its name is zygomatic because it then articulates with the zygomatic bone. Zygomatic process. Zygomatic bone is the bone of the cheek, and that's anterior. So the zygomatic process is pointing anteriorly toward the front of the skull. Articulates with the zygomatic bone. And da, da, da, da, last one today. Mandibular fossa. Mandibular fossa, I'm going to tell you where it is and then we'll identify it. Remember what fossa is, concave pocket. And the mandibular fossa is kind of telling me what's happening here. It is the pocket that articulates with the mandible, the bone called the mandible, which is the jaw. And the mandibular fossa, I'm going to give you two locators, is anterior to the external auditory meatus, anterior to the external auditory meatus, and inferior to the zygomatic process. So where is it? Right there, here is that little pocket called the mandibular foramen – or fossa, excuse me. And let's look at it articulated. What do we say is happening there? Were

saying that the mandible, the jaw', articulates there. And there it is, at the mandibular fossa. Malleus, incus, and stapes. Malleus means mallet, like a hammer. Incus means anvil, like a steel worker's anvil, metal worker's anvil. And stapes means stirrup, like the stirrup on a saddle. Is that better, Vanessa? Malleus, incus, stapes. Malleus is mallet, like a hammer. Incus – yeah, better. Better Amber? Is that better? Okay, great, excellent. Just ask away you guys, absolutely, you're so welcome. All right, we're going to stop there today with the bones. And if you need – absolutely, you might need a little break. And I apologize that we haven't taken our every about 15 minute to an hour break, because our weird start today, which – okay, unfortunate for you. You're the first lab in the lab this semester. So I guess we should have expected some of that. So I do – – Amy yeah, let me get back to that. Don't let me forget. So hopefully we will have no – but it's probably not going to happen. Let's be real. We'll probably still have a few hiccups here and there, but it's okay. We'll work through it. We are in it together. So don't get stressed or anxious or frustrated. I'm not stressed or anxious or frustrated. So it's going to be okay. And we'll get through it. We'll stop there with bones today. And yeah, so yes, there are so many parts. Let me do these in order. But we have lots of time to look at them. And so the bones, I will say to you, we spent more time on the bones and muscles, once we get there, than any other group of structures. And that's because the bones put the muscles together. If we know all the bones, and the parts of the bones that I'm identifying for you, we're going to be able to identify almost everything else in the semester, because we will have heard the words already. We will feel confident with what the words mean and how to locate them. And the skeleton just makes sense, right? The skeleton is what we built everything else on, with the rest of the body, either on top of the skeleton or within this skeleton. So if we feel confident with these, and we will, remember, remember, what did I say earlier? 177 years I've been teaching, and thousands and thousands and thousands of students, and guess what, they did it. And you will too, because I'm already feeling the positive energy from this group. So it's going to be good, so excellent. Amy, which, in particular, would you say? I mean, was there a particular side note? Was it on which bone or which structure can I answer that for you? And everyone, take a few minutes, if you need it, we're going to take the next 15 minutes only. We're going to finish, as I said. Not a lot of study time on the bones today, but I also want to give you time to ask questions about the study guide for our test, or just questions about the test. So take a couple of minutes. I'm going to end the recording in just a moment. And in fact, I'll actually do that now, so you're not hearing all this chitter chatter.