

## VIRTUAL DISSECTION LABORATORY ASSIGNMENT THE EAR

The Anatomage© table displays real-life anatomy of virtual cadavers. Keep in mind that these are real people who have donated their bodies for science, so please be respectful as you are using the table. Please only have one person touching the table at a time. No food or drinks are allowed near the table, and do not set anything on top of the table.

**Health and Safety Precautions:** Prior to interacting with the table, please wash your hands and put on gloves. Be sure to touch the table only with gloves or a stylus. Do not wipe or clean the table; your instructor will take care of this.

**General Touch Screen Instructions:** To zoom in on a structure, place two fingers on the structure and pull them apart. To move the entire structure at once, place two fingers on the structure and drag in the desired direction. Use one finger to tilt or rotate the structure. Tap once on an icon to select it.

**Custom Presets:** This laboratory was created using the Anatomage© Clinical Table. Custom presets are required in order to complete this assignment. A preset guide has been included.

### **LOCATING THE EAR STRUCTURES:**

Step 1: Open the Table Application.

Step 2: Select Gross Anatomy.

Step 3: Double tap the “Full Body Female Asian” scan to open (it will take a moment to load).

Step 4: Open preset 6.

Step 5: Familiarize yourself with the external ear structures represented by pins 1-6.

Step 6: Open preset 2.



Step 7: Select the explore icon to access the removal tool.

Select the removal tool. Tap on a desired structure to remove it.

Tap the “Undo” button to replace any structures you removed.

Tap the “X” to exit the explore icon.



Step 8: Using the removal tool, tap the patient’s forehead.

Exit out of the explore icon.

Step 9: Explore around the head and neck. Make some observations about what you see. Zoom and tilt as needed.

### **SECTION I: OUTER EAR**

Step 10: After you have familiarized yourself with the anatomy and table features, rotate the head to obtain a clear view of the right ear. Zoom in as needed.

Step 11: Measure the length of the ear.

Select the measuring icon in the bottom left corner.

Select the first ruler icon.

#### **\*\* To Measure a Structure:**

- 1. To place a point, tap once where you want the measurement to begin.**
- 2. Tap again where you want the measurement to end.**
- 3. The measurement will appear between the two points once both have been placed.**
- 4. If you need to remove a point or a measurement, use the “clear” icon located in the measuring icon.**



Step 12: Place your first point on the most superior point of the outer ear.

Place and your second point on the most inferior point of the outer ear.

**Question 1:** *What is the length of the outer ear? \_\_\_\_\_ mm*

Step 13: Clear the measurement by reselecting the measuring icon followed by the clear icon.



Step 14: Using one finger, tap once on surrounding structures to identify them.

**Question 2:** *What muscle stems from the crus of the helix?*

\_\_\_\_\_

**Question 3:** *What are two primary functions of the outer ear? Use notes/additional resources as needed.*

## SECTION II: MIDDLE EAR

Step 15: Select the “Eye” icon.

Uncheck “Musculature”.

Exit out of the “Eye” icon.



Step 16: Use the removal tool to remove structures.

Tap structures until the middle ear is visible.

Exit out of the explore icon.



**Question 4:** Name two structures you had to remove to view the middle ear:

1) \_\_\_\_\_ 2) \_\_\_\_\_

Step 17: Open the Home icon in the bottom left corner.

Step 18: Select “High Res Regional Anatomy”.

Step 19: Select “Ear”.

Select “Open” in the top right corner (it will take a moment to load).

Step 20: Explore the region.

Tap on the structures once to identify them.

Step 21: Locate the tympanic membrane (TM) and tympanic cavity.

Step 22: Use the removal tool to remove the tympanic cavity.

Exit the icon.



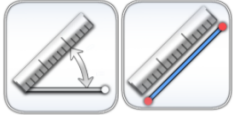
Step 23: Rotate the structures to view the middle ear bones.

**Question 5:** Which best describes the shape of the TM? Circle one:

a) Slightly convex      b) Slightly concave      c) Neither

Step 24: Rotate the structures to obtain a clear view of the lateral surface of the TM.  
It should appear flat on the surface of the table.

Step 25: Measure the diameter of the TM.  
Select the measuring icon in the bottom left corner.  
Select the first ruler icon.



Step 26: Place your first point on the edge of the TM.  
Place your second point on the opposite edge of the structure.

**Question 6:** What is the diameter of the TM (in mm)? \_\_\_\_\_ mm

**Question 7:** Calculate the approximate surface area of the TM. \_\_\_\_\_ mm<sup>2</sup>

Hint:  $\text{Area}_{\text{circle}} = \pi r^2$        $r_{\text{circle}} = \text{diameter}_{\text{circle}} / 2$

Step 27: Clear the measurement by reselecting the measuring icon followed by the clear icon.



Step 28: Use the removal tool to remove the TM.  
Exit out of the explore icon.

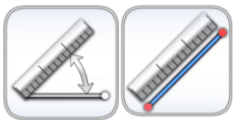


Step 29: Zoom and tilt as needed to obtain a clear view of the ossicles.

**Question 8:** Order the ossicles from lateral to medial:

1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_

Step 30: Measure the length of the stapes.  
Selecting the measuring tool icon.  
Select the first ruler icon (Zoom in as needed).



Step 31: Place your first point on the head of the stapes.  
Place your second point on the footplate of the stapes.

**Question 9:** What is the length of the stapes (in mm)? \_\_\_\_\_ mm

**Question 10:** What muscle articulates with the stapes? \_\_\_\_\_

Step 32: Clear the measurement by reselecting the measuring icon followed by the clear icon.



Step 33: Rotate the structures as needed to obtain a clear view of the malleus.

**Question 11:** What muscle is attached to the malleus? \_\_\_\_\_

**Question 12:** What is the other point of attachment for this muscle?  
\_\_\_\_\_

**Question 13:** Based on its attachment sites and your knowledge of muscle function, what do you think this muscle's purpose is? Use your own words.

Step 34: Use the removal tool to remove the following structures:

- **VIII nerve,**
- **Eustachian tube and**
- **Eustachian cartilage,**
- **Tensor tympani muscle.**

Exit out of the explore icon.



Step 35: Rotate the structures as needed to answer the following question.

**Question 14:** What structure does the stapes articulate with?  
\_\_\_\_\_

### **SECTION III: INNER EAR**

*\*Sound enters the cochlea through vibrations from the stapes. The direct insertion point of the stapes to the cochlea is called the oval window.*

Step 36: Use the removal tool to remove the ossicles.



Step 37: Label the Oval Window.

**\*\*\* To label the Oval Window:**

1. Tap on the Vestibule. This will highlight the entire structure.
2. Select the eye icon.
3. Select the small green box in the bottom right corner to open the 'Details' column.
4. Select the 'Annotations' dropdown.
5. Place a checkmark next to desired structures.
6. Close the icon to view the structure.



Step 38: Label the Round Window.

**\*\*\* To label the Round Window:**

1. Tap on the cochlea. This will highlight the entire structure.
2. Select the eye icon.
3. Select the small green box in the bottom right corner to open the 'Details' column.
4. Select the 'Annotations' dropdown.
5. Placing a checkmark next to desired structures.
6. Close the icon to view the structure.

*\*Sound travels into the cochlea through the oval window and exits the cochlea at the round window.*

Step 39: Place a pin on the round window.

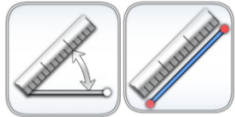
**\*\*\*\* To place a pin:**

1. Select the pin icon.
2. Select any type of pin.
3. Tap the structure where you want to place the pin.
4. To move the pin, hold and drag the red cube located around the pin.
5. To rotate the angle of the pin, drag the yellow sphere located above the pin.



Step 40: Place a second pin on the oval window.  
(see \*\*\*\* above for detailed instructions)

Step 41: Measure the distance between the two pins (the oval window and the round window).  
Select the measuring icon.  
Select the first ruler icon.



Step 42: Place your first point on one pin and your second point on the other pin.

**Question 15:** *What is the distance between the oval window and the round window?*

\_\_\_\_\_ mm

Step 43: Clear the measurement by reselecting the measuring icon followed by the clear icon.



Step 44: Clear both pins by reselecting the pin icon and selecting “Delete All”.



Step 45: Remove the Oval Window and Round Window Labels.

**\*\*\*\*\* To remove labels of any structure:**

1. **Open the “Eye” icon.**
2. **Tap the ‘A’ next to the desired structure in the ‘Structure’ column.**
3. **Ensure all checkmarks are removed from annotation column.**
4. **Exit out of the icon.**

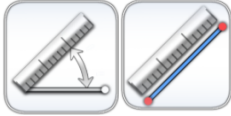
Step 46: Rotate the structures as needed to obtain a clear view of the semicircular canals.

**Question 16:** *How many semicircular canals are there (unilaterally)?* \_\_\_\_\_

*Can you differentiate between the anterior, posterior, and lateral semicircular canal?*

Step 47: Rotate the structures as needed to locate the cochlea.  
View the apex of the cochlea from a superior view.

Step 48: Measure the diameter of the cochlea.  
Select the measuring icon in the bottom left corner.  
Select the first ruler icon.



Step 49: Place your first point on the round window.

Place your second point on opposite edge of the cochlea (opposite from the round window).

**Question 17:** *What is the diameter (medial to lateral) of the cochlea (in mm)?*

\_\_\_\_\_ mm

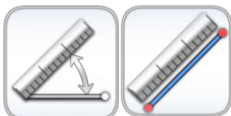
Step 50: Clear the measurement by reselecting the measuring icon followed by the clear icon.



Step 51: Take a coronal cross section of the cochlea.  
Select the clipping tool.  
Select the coronal icon.



Step 52: Measure the diameter from the apex of the cochlea to its most inferior point.  
Select the measuring icon in the bottom left corner.  
Select the first ruler icon.



Step 53: Place your first point on the apex.

Place your second point on the most inferior point of the structure.

**Question 18:** *What is the diameter (anterior to posterior) of the cochlea (in mm)?*

\_\_\_\_\_ mm



Step 54: Clear the measurement by reselecting the measuring icon followed by the clear icon.



Step 55: Undo the cross section.  
Reselect the clipping tool.  
Select the reset icon.



Step 56: Tap the explore tool.  
Tap the “Undo” button until all structures are returned.  
Exit of the explore icon.



Step 57: Rotate the structures to obtain a clear view of the cochlea. Locate the nerve that is attached to it.

**Question 19:** *What is the name of this nerve?* \_\_\_\_\_

**Question 20:** *Name the two branches of this nerve.*

\_\_\_\_\_

**Question 21:** *List 3 areas that this nerve innervates based on where it is located.*

\_\_\_\_\_

**Question 22:** *What other cranial nerve is located near the nerve identified in Question 19?* \_\_\_\_\_

Step 58: Tap the home icon followed by “Exit Application”.  
This will take you back to the desktop.  
Return the stylus but keep your gloves on until you leave the lab.

**Question 23:** *List 1-2 things you found interesting/insightful about the ear through completion of this lab.*