ANATOMY & PHYSIOLOGY II LAB
E-BOOK (II)

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A pair of lungs, each located lateral to the heart. Each lung is enclosed by a pair of Pleural Membranes that create a Pleural Cavity filled with Pleural Fluid. Left lung is smaller than the right due to heart’s orientation. Note: Pulmonary Artery being blue (heart to lung) & P. Vein being red (Lung to Heart)

LOBES of the lung (indicated by white arrows):

Three lobes on the right (lobes are separated by horizontal & oblique fissures (see lines))

R. Superior
R. Middle
R. Inferior

Two lobes on the left. (lobes are separated by a single oblique fissures (see line))

L. Superior
L. Inferior
LUNG MODEL (Lung model with bronchial tree)

Video Link: http://www.youtube.com/watch?v=M0vIUa3Ht2o

The Bronchial Tree starts at the inferior end of Trachea at a point called Carina. It branches off as R and L. Primary or Main Bronchi (Bronchus (singular)). It branches again as Secondary or Lobar Bronchi (three on R: R. Superior, R. Middle, R. Inferior; and two on L: L. Superior and L. Inferior). It branches further as Tertiary or Segmental Bronchi ending in fine, narrow Bronchioles that terminate in alveoli (alveolus (singular)).
Note: In this view, notice the Hyoid Bone and the cartilages seen anteriorly: Thyroid Cartilage (2) (Laryngeal Prominence is the pointed anterior projection of the Thyroid cartilage), Cricoid Cartilage (3) and Tracheal Cartilage (7).

Practice using the white arrows or your own pointers to test all parts that you can see/find.
In this sagittal view, notice the **vocal cords** (false vocal cord or vestibular fold (superior), **true vocal cord** (29) or vocal fold (inferior) enclosing the **glottis** (opening seen only when both pieces are put together). Seen above glottis is the **Epiglottis** (23).

Practice using the **white arrows** or your own pointers to **test all the parts** that you can see/find.

Note: The model has been split in half, right!
In this posterior view, note the **Epiglottis (3)**, **Arytenoid Cartilage (4)**, **Corniculate Cartilage (5)**. Practice using the **white arrows** or your own pointers to **test all the parts** that you can see/find.
LARYNX MODEL (anterior and posterior views) (TEST YOURSELF ON THE PARTS)

Arytenoid & Corniculate cartilages found on the posterior side. Practice using white arrows.
7. **Thyroid Cartilage** (*Laryngeal Prominence* is the pointed anterior projection of the Thyroid cartilage)

2. **Cricoid Cartilage** (inferior to Thyroid Cartilage)

5. **Tracheal Cartilage** (C-ring like, found outside Trachea)

Practice using the **white arrows** or your own pointers to test all the parts that you can see/find.
9. Vocal Fold (true vocal cord).  Glottis is the opening between the true vocal 
cords. Practice using the white arrows or your own pointers to test all the parts that you 
can see/find.
HUMAN BRONCHIAL TREE – SPECIMEN

Video Link: https://www.youtube.com/watch?v=TQ24-WCsYN4

31. Trachea  32. Carina  33. Right Primary Bronchus  34. Left Primary Bronchus

35. Right Superior Secondary Bronchus  36. Right Middle Secondary Bronchus
37. Right Inferior secondary Bronchus  38. Left Superior Secondary Bronchus (next page)
39. Left Inferior Secondary Bronchus  40. Tertiary Bronchi
Practice using the **white arrows** or your own pointers to test all the **parts** that you can see/find.
URINARY SYSTEM

Video Link:  http://www.youtube.com/watch?v=ylk6ptX0dl&feature=related

Note: A pair of **Kidneys** with a pair of **Ureters** leading to the **Urinary Bladder**
KIDNEY MODEL

Parts: Renal Capsule (layer seen outside the kidney), Renal Artery (red blood vessel entering kidney), Renal Vein (blue blood vessel leaving kidney), Renal Cortex (outer lighter colored region), Renal Medulla (darker region with the pyramids), Renal Pyramid (triangular, pyramid-like sections), Renal Column (separates adjacent renal pyramids), Renal Papilla (tiny channels at the inferior end of a renal pyramid), Minor Calyx (renal papillae lead to Minor Calyx), Major Calyx (two or three minor calyces converge to form a major calyx), Renal Pelvis (funnel-shaped, collects urine from major calyces).
KIDNEY MODEL (CROSS-SECTION)

(Practice using the white arrows or your own pointers to test all the parts that you can see/find)
Two Nephrons seen sharing a collecting duct spanning the cortex and medulla. Also, one can see Nephron(s) starting with Renal Corpuscle (Glomerulus (network of blood capillaries)+Bowman’s or Glomerular Capsule), followed by PCT, the loop of Henle with the descending and ascending limbs, DCT, and a Collecting Duct. Use the white arrows to test yourself on the parts you learnt.
NEPHRON - RENAL CORPUSCLE (BOWMAN’S CAPSULE+GLOMERULUS)

Video Link: http://www.youtube.com/watch?v=vJKFuwnnKQE

Note: Podocytes (Filtration Cells) seen on the visceral layer enclosing the blood capillaries
(Practice using the white arrows or your own pointers to test all the parts that you can see/find)
Urinary-Reproductive System (Female Cat)
REPRODUCTIVE SYSTEM (FEMALE CAT)

FEMALE CAT

(Practice using the white arrows or your own pointers to test all the parts that you can see/find)
Urinary-Reproductive System (Male Cat)
Urinary-Reproductive System (Male Cat) (TEST)
1. Testis
2. Epididymis
3. Vas Deferens (Ductus Deferens)
4. Seminal Vesicle
5. Ejaculatory Duct
6. Prostate Gland
7. Cowper's Gland (Bulbourethral Gland)
8. Urethra (prostatic, membranous, penile)
9. Corpus cavernosum
10 & 12. Corpus Spongiosum
11. Glans Penis
13. Urinary Bladder
28. Rectum
30. Anus
FEMALE REPRODUCTIVE SYSTEM

Video Link: http://www.youtube.com/watch?v=5uPNr27eSVA&feature=related
Female Urinary/ Reproductive System  
- Sagittal Section

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<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Ovary</td>
<td>7</td>
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<tr>
<td>2</td>
<td>Fallopian Tube</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Fimbriae</td>
<td>11</td>
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<tr>
<td>5</td>
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<td>6</td>
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<td>22</td>
<td>Urethra</td>
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(Chart on next page)
1. Testis
2. Epididymis
3. Vas deferens
   (Ductus deferens)
4. Spermatic cord
5. Seminal Vesicle
6. Tunica Albuginea
7. Prostate Gland
8. Kidney
9. Urethra
10. Penis
12. Renal artery/vein
13. Glans Penis
14. Ureter
15. Spermatic artery/vein
16. Scrotum
17. Urinary Bladder
1. Testis
2. Epididymis
3. Vas Deferens
   (Ductus Deferens)
4. Spermatic cord
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12. Glans Penis
13. Ureter
14. Spermatic artery/vein
15. Scrotum
16. Urinary Bladder
Testis Slide Details: Single seminiferous tubule and stages of sperm (spermatozoan) development within the Testis (organ):

Testis (organ in which this structure is found), Seminiferous Tubule (entire structure seen in the slide), Lumen (hollow space in the middle)

Stages of development: (labelled with pink color, outermost layer to the middle (lumen)

Spermatagonium (outermost layer), followed by (as you move from the outermost layer to the middle) a layer of Spermatocyte, then the Spermatids (elongated cells), and finally the thin, long Sperm cells (found in the lumen)
A SINGLE SEMINIFEROUS TUBULE
(TEST YOURSELF ON THE STRUCTURES)

Video Link(s): http://highered.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::535::535::/sites/dl/free/0072437316/120112/anim0043.swf::spermatogenesis

http://www.youtube.com/watch?v=q_HZqqy49ac
Seminiferous Tubule (more views)
OVARY (Graafian Follicle) SLIDE

Video Link: http://www.youtube.com/watch?v=2TIHFAKm0N8

Ovary Slide Details:

Antrum (space within the Graafian Follicle), Secondary Oocyte (clear round structure in the middle), Zona Pellucida (clear layer around the oocyte), Corona Radiata (outer layer of colored cells around the clear layer)
GRAFFIAN FOLLICLE

(TEST YOURSELF ON THE STRUCTURES)
Starfish Development Slide Details:  **Ovum** (unfertilized egg) (single red cell showing an outline of nucleus with dark (dot) nucleolus inside),  **Zygote (fertilized)** (single red cell – nucleus, nucleolus not seen or visible),  **Morula** (cluster of 16 cells),  **Blastula** (this stage follows Morula stage, looks like a “hollow ball of cells”, cluster of cells with fluid-filled space in the middle, cells pushed ore to the side, three seen here),  **Gastrula** (follows Blastula stage, large cell with clear space and dark involution (inward curvature or penetration), only one cell seen here)
BLASTULA (HOLLOW BALL OF CELLS)

GASTRULA  (Video Link: http://www.youtube.com/watch?v=Lgb4wMsZwZA)
STAR FISH DEVELOPMENT SLIDE

(TEST YOURSELF ON THE DEVELOPMENTAL STAGES)
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Corona Radiata</td>
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<tr>
<td>B</td>
<td>Zygote</td>
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<tr>
<td>C</td>
<td>4 - Cell Stage</td>
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<tr>
<td>D</td>
<td>Morula</td>
</tr>
<tr>
<td>24</td>
<td>Corona Radiata</td>
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<tr>
<td>25</td>
<td>Spermatazoa</td>
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<tr>
<td>26</td>
<td>Amniotic Cavity</td>
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<tr>
<td>27</td>
<td><strong>Ectoderm</strong></td>
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<tr>
<td>27</td>
<td><strong>Mesoderm</strong></td>
</tr>
<tr>
<td>27</td>
<td><strong>Endoderm</strong></td>
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<tr>
<td>28</td>
<td>Yolk Sac</td>
</tr>
<tr>
<td>39</td>
<td>Chorion</td>
</tr>
<tr>
<td>40</td>
<td>Allantois</td>
</tr>
</tbody>
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* 3 germ layers make up the Embryonic disc

(CHART ON NEXT PAGE)
CAT VEINS

Videos from Gary Moo Young

https://www.youtube.com/watch?v=M7YUemg30Ng&list=PLMaKVmvUYmGwT3pUzp5q6Jbi0UfKZ6-Vz
UPPER VEINS - CAT

right external jugular v.
left internal jugular v.
left external jugular v.
transverse jugular
UPPER VEINS - CAT
UPPER VEINS – CAT
(TEST YOURSELF)
UPPER VEINS – CAT
(answers to arrows)
LOWE R VEINS – CAT
L. Ovarian Vein comes off of L. Renal
(Ovarian in Female/Spermatic in Male)
LOWER VEINS – CAT
(TEST YOURSELF)
LOWER VEINS – CAT
Common Iliac Veins and their branches

R. Iliolumbar V.
L. Common Iliac
L. Internal Iliac V.
L. Femoral V.
L. Superior Articular V.
L. Popliteal V.
L. Saphenous V.

Skip this one not in lab book.
LOWER VEINS – CAT
Left Femoral Vein and its branches
(TEST YOURSELF)