

IB Biology Summer Work—Anatomy

For this assignment you will need to draw diagrams for each anatomy system listed below. The drawings will need to be labeled and include definitions. You will then need to voice over the process that occurs within each system. The drawings will need to be drawn in your sketchbooks and each will be on its own page. You will take a picture of each sketch and add it to google slides to conduct your voice over. The voice over should be no longer than **15 minutes TOTAL** for the entire project. Everything must be hand drawn and handwritten.

You need to be VERY FAMILIAR with this information when you come to class the first day of school. Understanding and learning early will help you tremendously with this class.

1. Digestive System
 - a. Draw the digestive system. Label the following: salivary gland, liver, gall bladder, large intestine, oesophagus, stomach, pancreas, small intestine, rectum.
 - b. Define each of the words: salivary gland, liver, gall bladder, large intestine, oesophagus, stomach, pancreas, small intestine, rectum.
 - c. Voice over: Describe how food moves through the digestive system.
2. The Blood System
 - a. Draw the structure of the heart. Label the following: right atrium, left atrium, right ventricle, left ventricle, superior vena cava, inferior vena cava, aorta, pulmonary veins, pulmonary artery, tricuspid valve, aortic valve, and bicuspid valve.
 - b. Include arrows that represent the direction blood is flowing through the heart.
 - c. Define each of the words: right atrium, left atrium, right ventricle, left ventricle, superior vena cava, inferior vena cava, aorta, pulmonary veins, pulmonary artery, tricuspid valve, aortic valve, and bicuspid valve.
 - d. Voice over: Describe how blood flows through the heart and to the pulmonary system or to the rest of the body.
3. Gas Exchange (2 diagrams)
 - a. Draw the structure of the lungs. Label the following: trachea, bronchiole, bronchus, alveolus, and diaphragm.
 - b. Draw the structure of an alveolus and an adjacent capillary.
 - c. Define the following: trachea, bronchiole, bronchus, alveolus, diaphragm, and pulmonary surfactant.
 - d. Voice over: Describe how air enters and leaves the lungs. (Drawing A) Describe how gas exchange occurs between the alveolus and the capillary. (Drawing B)
4. Neurons and Synapses (2 diagrams)
 - a. Draw the structure of two neurons. Label the following: dendrite, nucleus, soma, myelin sheath, and axon terminal.
 - b. Define the following: dendrite, nucleus, soma, myelin sheath, and axon terminal.
 - c. Voice over: Describe how the electrical signal travels through a neuron and how it moves to the next neuron.
5. Male Reproduction
 - a. Draw the structure of the male reproductive system. Label the following: vas deferens, ureter, bladder, urethra, prostate gland, erectile tissue, scrotum, testis, penis, epididymis, and seminal vesicle.
 - b. Define the following: vas deferens, ureter, bladder, urethra, prostate gland, erectile tissue, scrotum, testis, penis, epididymis, and seminal vesicle.
 - c. Voice over: Describe the path taken by sperm from production to release.
6. Female Reproduction
 - a. Draw the structure of the female reproduction system. Label the following: uterus, ovary, cervix, vagina, fallopian tube, endometrium, and fimbriae.
 - b. Define the following: uterus, ovary, cervix, vagina, fallopian tube, endometrium, and fimbriae.
 - c. Voice over: Describe the path the egg takes from production to implantation.

7. Movement
 - a. Draw the structure of a sarcomere. Label the following: actin, myosin, I band, A band, Z disc, and H zone.
 - b. Define the following: actin, myosin, I band, A band, Z disc, and H zone.
 - c. Voice Over: Explain how a sarcomere works and how it relates to the contraction of muscles.
8. The Kidney (2 diagrams)
 - a. Draw the structure of the kidney. Label the following: renal artery, renal vein, medulla, renal pelvis, cortex, and ureter.
 - b. Draw the structure of a nephron. Label the following: proximal convoluted tube, Bowman's capsule, glomerulus, Loop of Henle, distal convoluted tube, vasa recta, collecting duct.
 - c. Define the following: renal artery, renal vein, medulla, renal pelvis, cortex, ureter, proximal convoluted tube, Bowman's capsule, glomerulus, Loop of Henle, distal convoluted tube, vasa recta, and collecting duct.
 - d. Voice over: Explain how the kidneys remove wastes for excretion. (Drawing A) Explain how the nephron filters blood. (Drawing B)

Helpful sites:

- <https://www.khanacademy.org/science/biology/human-biology>
- <https://www.khanacademy.org/science/high-school-biology/hs-human-body-systems>
- <https://www.innerbody.com/htm/body.html>
- https://www.youtube.com/results?search_query=bozeman+science+anatomy+and+physiology

IB Biology Summer Work—Internal Assessment Preparation Section

In preparation for your Internal Assessment for Biology, you will do a review of basic vocabulary and concepts that you need to be familiar with in order to make your IA a success. The following should be ADDED ONTO the END of your GOOGLE SLIDES that you submit to Schoology on the FIRST DAY of class.

Title of Slide(s): General Vocabulary

Instructions: Define/describe the following terms. Include the terms on the slides.

1. Independent Variable
2. Increments
3. Dependent Variable
4. Control Variable
5. Uncertainty of Measurement with Example

Title of Slide(s): Graphing Basics

Instructions: Answer the following questions in complete sentences. Include the prompt on your slide.

1. When graphing data, explain what variable you should place on the x-axis and on the y-axis.
2. Explain what is meant by “properly labeling the axes” of a graph.
3. Explain how error bars are used and what they mean in terms of data shown.
4. Show an example (picture) and state what type of data is appropriately shown by the following graph types:
 - A. Line graph
 - B. Scatterplot with trendlines
 - C. Circle (Pie) Graph

- D. Bar graph
- E. Double bar graphs
- F. Histogram
- G. Box and Whiskers plot

Title of Slide(s): Statistical Analysis

Instructions: Create a slide(s) with a description of each type of statistical test. This should include what each test shows, the mathematical manipulation of how to find the value, and what type of data is appropriate for each test.

1. R^2 value
2. T-test
3. Paired t-test
4. ANOVA
5. Chi-squared test

PLEASE READ CAREFULLY: According to the IB animal experimentation policy, **NO animals** (vertebrate or invertebrate) can be used in the IA! This includes ANY FORM of human experimentation! **NO HUMANS!** In addition, because bacteria cultures are usually unsuccessful in our lab setting, **DO NOT** design your experiments around any sort of bacterial growth. **NO BACTERIA!** If you have specific questions, PLEASE email us before completing this section of the summer work.

There are PLENTY of websites available for you to get ideas from for this part of the assignment. Google “IB Biology IA Ideas” to start. Remember, the above statement when looking at ideas. Some of the things on the internet are not appropriate for our lab setting.

Title of Slide(s): Topics Research—Complete **TWO TOPICS** according to the criteria below:

Instructions: Create a slide(s) with the following information based upon topics you would like to investigate for your IA.

1. Name of overarching concept: This is the BROAD topic (photosynthesis, ecology, etc).
2. Scientific explanation of concept—What is the concept? Give a definition and overview of the concept. Include citations for this information, if needed.
3. What about this topic would you like to investigate? Give a broad indication of your experiment that includes an independent and dependent variable--what would you be changing and what would you be measuring?
4. Give TWO citations of scientific studies that have done something like your idea in #3. Summarize each of the citations in one-two sentences.
5. Explain what you would like to do. This is the general procedure. If you found a link to an idea, you may include that here.
6. Personal interest—Why did you find this topic interesting? This should be YOUR OWN THOUGHTS and it should also include connection to BOTH A and B below:
 - A. Application based on personal interest—Link your personal interest to the scientific concepts using citations.
 - B. Application based on community/global interests—How does your topic apply to local community issues or global perspectives in biology?

If you have questions, please contact us at any time at llalexander@auburnschools.org and dagrubb@auburnschools.org. We will check our email weekly over the summer break and will be happy to assist you. However, please do not ask us to proof your ideas when completed before grading, as we will not do this. We WILL be happy to assist you on getting on the right track for the assignment.