

BIOL 302 - Comprehensive Human A&P

II Learning Journal

- Keep track of your progress through the course in this document.
 - Each week, you will get a new template to paste at the bottom of your document with various levels of questions that may ask you to self-reflect, brainstorm, or apply concepts from class. Please type your answers in any **other** color than black.
 - This is not an “assignment,” and it is never “complete.” It, like you and me, is a never-ending work in progress.
 - In addition to the templates, you can add ANYTHING else you want here: random thoughts or questions about class, rough drafts of writing assignments, class notes, etc.
 - You can write as little or as much for each question, in whatever form you want, with or without good grammar and spelling, full sentences, or bullet points, or stream of consciousness.
 - Each week, you will schedule a meeting with me (www.calendly.com/brandonjackson) to discuss your entries here, other assignments, and course material. Plan on scheduling 40-60 minutes per week.
 - At the end of the semester, this learning journal will be the primary evidence you provide to support your self-assigned grade.
 - IMPORTANT NOTE: The greatest benefits from a learning journal come when you look back at your previous self, and recognize how you’ve changed. To that end, you shouldn’t delete or correct your “answers” to template questions if you realize you put in something wrong or unexpected. Just make an entry below the answer (add a new date if you want, maybe change color), and put in your updated entry - including why you felt the need to update it!
 - Each week there will be an **Energy** entry where you should jot down your thoughts that connect the week’s content to energy in the body. You can use one of the following questions as a guide:
 - *What is the purpose of this system in terms of energy flow through the system and energy balance at the organismal level?*
 - *In what form is the energy in this system or process at the sub-cellular, cellular, up to organismal and environmental level?*
 - *What are the energetic costs and benefits of this system or process and how is that balance optimized?*
 - *How is this system or process contributing to the energy flow in the other systems or the organism as a whole?*
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Week 1 - March 14-18: Blood

Course Intro Thoughts:

Self Reflection: Why are you taking this course? What are your goals in this course? What do you want to get out of it?

I am taking this course because I want to obtain a more in depth understanding of the human anatomy and physiology. I aim to understand and master the content and I want to be able to apply it to my life in various ways. This includes but is not limited to understanding my own body, helping educate others about their bodies, understanding the interconnectivity of our bodily systems as well as with our surroundings.

What does “success” look like to *you* at the end of the semester?

Success to me in the class is being able to master this content and teach it to others and apply it where needed in my future goals and studies. I plan to apply to dental school after undergrad and hope that this background experience will be continued.

Self Reflection: What role does stress play in your learning?

Stress can make me overwhelmed and sometimes it's hard to differentiate between good and bad stress. I hope to begin making a more clean division between the two and understand that as long as I do the best I can do it will all work out.

3 minute brainstorm: For these brainstorm questions, set a timer for the allotted time and quickly type out anything that comes to mind. It doesn't have to be clean, just get it out (you can always clean it up later if you want to). *Energy* is a key principle we will discuss in class. What do you know about energy and its role in any part of biology?

Without energy nothing happens, our bodies stay in a homeostasis like state and cannot function and do the basic things we need to survive.

3 minute brainstorm: Write down anything you think of when it comes to energy in your own body (your own anatomy and physiology).

I think of ATP, the digestive system, signaling that tells the body to keep doing or not when there is energy to be expended, sleep is restoring our ability to “process” energy.

Blood: 2 minute brainstorm: Write down everything you think of when it comes to the purpose or function of blood.

Blood is vital to our anatomy because it carries cells throughout the body. These cells include hormones, oxygen, macrophages and neutrophils to the site of a wound, etc.

Energy: What role does blood play in the body regarding energy? (you may use one of the questions at the start of this document as inspiration to get started)

Blood carries oxygen to the muscles which is a higher aerobic capacity. This then reduces muscle fatigue and enhances endurance.

What is the energy cost? The heart is pumping, muscle. Job of blood, move O₂.

Opportunity cost of blood: gives up nucleus to carry my hemoglobin: then you can't regenerate, or heal. Hemoglobin: protein binds to iron. The spleen and liver- broken down, filtered.

Recycled. Dehydration synthesis takes energy and enzymes. To synthesize molecules etc.

CONTENT question: Bandages have come a long way. We used to just apply some cotton gauze to a wound, and now you can buy engineered military trauma packs for a few dollars that can stop blood in bigger wounds faster than cotton.

+ How does just cotton gauze, applied with a bandage with mild pressure (basic first aid), stop the bleeding of a wound faster than applying nothing or than applying pressure with hands but without gauze? What does pressure do? What does the gauze replace, complement, or supplement?

Pressure stops blood from leaving maintaining hemostasis before the platelets come and clog the hole in the skin. The gauze replaces fibrin needed so there is less chance for overstimulation of fibrin which can lead to excessive clotting (embolus).

+ What molecules or substance would you add to gauze to speed the process further? Note, that if it will be field-stable, your additive should be very stable in a variety of conditions until the package is opened (i.e. proteins may not be a good additive). What material would you make the gauze out of, and why?

Collagen to increase the speed of platelet stickiness.

Week 2 - March 21-25: Cardiovascular

Heart

2 minute brainstorm: Write down how you explain how to maintain a "healthy heart" to a non-scientist family member.

A healthy heart maintains good electrical signals, pressure, and rhythm. It stays at a good rate of 80 resting ish?

Why is high blood pressure in the aorta, over time? The heart has to make a higher blood pressure therefore struggle. Good to have during stress.

Salt attracts the water— HBP.

Energy: What role does the heart play in the body regarding *energy*?

Heart plays a role in energy by sending oxygenated blood throughout the body and deoxygenated blood to the lungs. It also uses ATP through the Sodium Potassium channel.

Circulation

3 minute brainstorm: What is the purpose of *capillaries*, and where do we find them?

Capillaries connect arteries to veins, they also allow oxygen, nutrients, carbon dioxide and waste products to pass to and from the tissue cells.

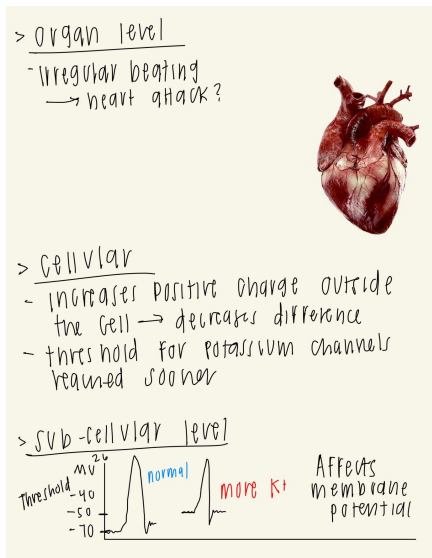
Energy: As blood travels from arteries to capillaries and back to the heart, blood vessels change diameter. In terms of energy, why? Why have larger arteries run far from the body, then divide into smaller vessels? Why not have a bunch of smaller vessels branch much closer to the heart? Why the same (but in reverse) with veins?:

This is because the arteries and the aorta handle most of the pressure emitted by the pulses of the heart. They are larger to compensate for the larger flow of blood (transport) and then separated to divide into smaller thinner vessels to allow larger things to flow through them (O₂ and nutrients) and into the muscles.

For veins they need to diffuse all the bad stuff from your cheeseburger and alcohol because it gets transported out of your body.

CONTENT question: 1. Electrolyte levels in the blood and body are closely regulated at relatively narrow ranges. Some localities use an injection of potassium-chloride in lethal injection to stop a person's heart. Several real-life killers, and movie counterparts, have used such injections as a difficult-to-detect method of killing. The result of the overdose of potassium ions (K⁺) mimics the effects of naturally occurring cardiac arrest.

+ Explain, at the organ, cellular, and sub-cellular level, how exactly the excess K⁺ in extracellular fluid affects the heart's rhythm. I suggest using multiple drawings, graphs, or flow charts (drawn by you), showing how the heart rhythm is produced under normal conditions, and the effect of the K⁺ overdose. If you explain it well enough, the next part should be a relatively easy follow-up.



+ How could you treat such an overdose? What would you inject, and why would it help (at the organ, cellular, and sub-cellular level)? What would change physiologically? You might inject more than one substance.

Na would be needed to revert back to the normal resting membrane potential, therefore a regular heart beat, then increases negative charge inside the cell. The threshold is reached slower.

How to get the K out? Drink lots of water? Potassium binding?

Week 3 - March 28- April 1: Lymphatic and Immune

Lymphatic

2 minute brainstorm: Write down everything you know about the lymphatic system:

The lymphatic system helps clean the body through the immune system. This consists of the lymph nodes in various places in the body.

Immune

30 second brainstorm: What is your least “favorite” part of the immune system?

I don't like how you get sick when you travel, why are our immune systems lowered when there's a time change, what is jet lag?

If you are not sleeping you are stressed/ then the brain shuts down the immune system to get sleep/ decrease stress on the body.

Pumping more blood, more O_2 glucose = cell respiration breathing faster, glycogen/muscles, Peripheral vision

Mobilizing and distributing energy = fight or flight.

Epinephrine/cortisol breaks down reserves, but it suppresses the immune system.

systems/infection not the same thing. So maybe you are already infected during exams but your stress is suppressing your immune system and that's why when you finally relax at home for Christmas you get sick.

vaccine = feel sick after but it's just your immune system.

Body overreacts through inflammation

Energy: The immune system is energetically expensive. What specifically are the energetic costs? And why on earth do we have something so costly - what are the benefits in terms of energy?

To make large proteins you need lots of ATP, it is not moved by pressure therefore making it slower and using up more energy. Removing waste and accepting things to clean takes a lot of energy.

ARGUE: Arthropods (including insects) have "open" circulatory systems, where the heart pumps blood through a tube that just opens into the body cavity, the blood washes over the organs, then is picked back up by other vessels to be returned to the heart. Vertebrates, like us humans, are said to have a "closed" circulatory system, wherein the blood stays within blood vessels. Use what you know about blood vessels and the lymphatic system to argue either that 1: Humans DO have a closed circulatory system, or that 2: Humans actually have an open circulatory system.

Humans have a closed system because of the constant pressure that regulates the flow throughout the body whereas the open system relies on tissues, muscle contractions which make it less able to be regulated/ slower.

CONTENT Question: Covid, influenza, colds, stomach viruses, and many other viral and bacterial infections of all parts of the body begin with the same suite of symptoms: body aches, fever, runny nose, etc. Explain to a non-scientist friend why so many different infections cause so many similar symptoms despite infecting different parts of the body.

This is the body regulating homeostasis through basic processes to help stabilize the body through the lymphatic system, which uses cellular biology cells/system to activate certain systems.

Week 4 - April 4-8: Respiratory and Mid-semester reflection

Respiratory:

Development of teeth?

3 minute brainstorm: What do you know about the respiratory system?

Lungs, airways, and blood vessels health you breathe and supply the necessary oxygen to your body so it can continue to function and make energy.

Energy: The energetic benefits of the respiratory system are fairly obvious. What are some of the costs?

Heat and water!! When you breathe out of your nose you lose less water.

CONTENT Question: The inside of our lungs are coated in fluid, and yet we (especially children) can drown if a fairly small amount of water gets into our lungs. Two questions: why can't we breathe water (it does contain oxygen, and fish can do it after all), and how can such a small amount of water kill us, even hours after we aspirated it? Relatedly, is fresh or saltwater more dangerous, and why?

Protects it from physical damage, protects it from disease by mucosal layers.

We are breathing out water, going outside when its cold breathing out your mouth, but when you breathe out your nose it runs but it, is saving a lot of water.

Loses heat quickly.

Spend more energy getting water, maintain body temperature, fighting disease, getting rid of dust. Just like frogs and axol because they live in water.

We are warm blooded, energetic.

What are the evolutionary costs? Benefits of our current system outweigh alternates.

Mid-Semester Reflection:

Self Reflection: We are now about halfway through the semester. Scroll back up to the start of this document, to the first question, where you defined "success" for you. Would you consider yourself "successful" in meeting your own definition? In what parts of the course have you been successful or unsuccessful? Why?

Eco-something: you pay to go on vacation, you are assigned to a scientific study (nonprofit)

I feel that I've been successful because of the videos, talking to friends.

What exactly is abrasive in charcoal?

Layers of enamel, stacked books deers cows, bison etc. Grass is high in silica, a defensive mechanism.

Silica is used in spices to make it taste more flavorful.

Self Reflection: No matter how you answered the question above, you have probably surprised yourself one way or another. How?

Surprised by my ability to critically think about the energetic side of anatomy which has never really been a focus in anatomy classes and I am surprised about the knowledge that I retain even if I am not being tested on it.

Self Reflection: If you had to give yourself a letter grade at this point, what would it be? What evidence would you provide? Are you happy with that assessment?

A-, watching videos, notes, participating, building on that knowledge, no one else in class is doing.

Outline bullets for myth project by learning conference next week, to help improve

Part 2 and three one sentence each

Updating your model: In each of the previous weeks, you were asked to brainstorm ideas for how a system functions, and how that system is related to the energy in the body. Review your previous answers. What else have you learned? Have you changed your mental model for understanding those topics? Write your thoughts here or under each answer above.

I learned about the cost, metabolism= feeling tired at an organismal level, how your body tells you, brain function, hormones.

Week 5 - April 11-15: Digestive

Digestive System

3 minute brainstorm: What do you know about the digestive system

I know we have to break down the food so we can absorb the nutrients and then absorb that energy to then get rid of the stuff you cannot absorb

ENERGY: The digestive system is obviously important for taking in sources of energy. What are the energetic *costs* of the digestive system at the molecular, cellular, organ, and/or organismal levels?

The energetic costs are what it takes to break down/absorb the molecular forms: glucose, AA, fatty acids.

Nutrition and Metabolism:

3 minute brainstorm: Write everything you can about nutrition and metabolism. What do those words mean to you?

Nutrition is a balance of substance needed to maintain the bodily functions in a “healthy” way. Carbohydrates, fats, dietary fiber, minerals, proteins, vitamins, and water.

Metabolism is a level at which the body processes these substances to turn them into energy instead of fats.

ENERGY: Metabolism is literally entirely about energy. So, revisit one of the organ systems you covered in BIOL 301 (integumentary, skeletal, muscular, nervous, endocrine), and discuss how regulating metabolic processes influences the energetic costs and benefits of that system.

The food are nutrients are use, amino acids for the muscles

Nervous system uses glucose/ acetyl COA alot of it

Insulin helps with the endocrine system/ glucagon= stress hormones

The skeletal (calcium phosphate and calcium) system needs energy for the (macrophages: compounds to break down bone/ acid (high energy) and enzymes) clasts, blasts and such.

Vitamin d helps absorb: milk/ fat soluble

CONTENT: If we take things to unrealistic extremes, let's say you have two dietary options. One is to eat 95% of your calories a day in potatoes and bread, and 5% in bacon. The other is to eat 95% of your calories a day in bacon, and 5% in potatoes and bread. With both diets, your basic minimal nutrient needs are met. With both, assume you take enough multi-vitamins and supplements (and assume they actually work!) to satisfy all other basic needs, so ignore everything other than the major macromolecules (carbohydrates, proteins, lipids).

Fats are harder to break down, in your stomach longer and make you feel fuller longer.

+ Regarding the digestive system, why are you likely to end up eating more calories, or have a more difficult time limiting caloric intake, on the bread and potato diet compared to the bacon diet? What is different between the diets in terms of macronutrients? What is different about how the digestive system handles these types of nutrients, and the effect of these nutrients on the digestive system, that might impact digestive system function and thus total caloric intake? (30 points)

On the bread diet you are going to consume less calories because these carbs are low in calories but fill you up faster. This encourages you to eat until satiated. You will stay full for longer.

On the bacon diet you will be consume fats activate the metabolic process called ketosis, where the body uses fat and sodium instead of sugar to accelerate energy and promote weight loss. The fats are converted into protein and that reaches the feeling of being satiated.

Too much acid coming acid/fat too much tells stomach to slow down.

**Gastric regulation: intestinal absorption
How fast is the stomach empty**

This is not a black and white conversation

Week 6 - April 18-22: Urinary

Last week I posted a nutrition and activity tracking lab activity. If you did it, what did you learn, or what finding was unexpected or surprising?

I didn't find it useful because all I do is study ahaha and eat and sleep sometimes.

3 minute brainstorm: Without looking at any resources, name as many of the "tubes" as you can describing the path that starts with blood plasma, and ends with urine leaving the body.

Nephron! Kidney tubes! Descending ascending!

3 minute quick answer: In your own words, define or describe “filtration” and “reabsorption” in a way that would have made sense to you before this class.

Filtration: filter out the bad stuff or the stuff that is too big to get in and reabsorption is stuff that you still need even though it couldn't make it through filtration.

ENERGY: The kidneys may seem to be passive filters, but they actually use a lot of ATP actively pumping Na^+ from the filtrate to the blood. **WHY** do we expend so much energy on reabsorbing sodium?

When you are taking in more salt you are more thirsty. It takes a lot of your body's system to understand how much needs to be reabsorbed (hormones, ADH) you need sodium glucose transporters, a lot of transporters to get it back into your system after being filtered out.

What is the main job of kidneys: form of homeostasis, water balance volume,

We spend so much energy reabsorbing sodium because the water follows sodium.

Filters more water than you have blood.

Then you need to reabsorb → recollect → what they don't take becomes urine

CONTENT: The kidneys' job is to not just excrete wastes, but also to regulate the total volume of fluid in the body, and the concentration of solutes in that fluid. Using one of the topics covered earlier this semester (heart, circulatory system and exchange, immune system, respiratory system), describe potential problems that would arise if the kidneys failed to do their job (i.e., if either blood volume/pressure or solute concentrations were too high or too low).

If the solute concentrations were too low then there would be no H_2O absorption then you would be dehydrated because your body tried to filter out all of the water you needed. This is comparable to the circulatory system because the system is able to respond to other things moving out of the system and replace them to keep the feedback loop going and your body functioning.

What happens if you don't have enough fluid → low water low pressure → in capillary beds no water flow no oxygen to muscles. dehydration → nothing is getting taken to muscle beds as efficiently.

ADVANCED CONTENT (optional thought question): Consider potential problems of overhydration. Specifically regarding the kidneys, some top endurance athletes will deliberately under-hydrate about once per week while training (not the day before a competition, of course). The hypothesis is regular complete or over-hydration changes their kidneys such that they can't produce as concentrated urine. This intermittent under-hydration helps reset their kidneys so that during competition (like a marathon), their kidneys and body are better able to cope with the effects of dehydration. Focussing only on the kidneys: How do kidneys produce concentrated urine, and why might chronic complete or over-hydration reduce that ability? Why might occasional (weekly) low hydration reset that ability, and allow their body to cope with low water intake during a marathon?

ADH, the medullary collecting ducts become freely permeable to solute and water. As a consequence, the fluid entering the ducts acquires the concentration of the interstitial fluid of the medulla, → the urine becomes concentrated.

Low solute in filtrate to high concentration in medulla (salty) → washing away salts (gradient)

osmolarity is different in various parts of body
Maintain blood volume, kidney have to reabsorb water,

Overhydration occurs when the amount of salt and other electrolytes in your body become too diluted.

A reset will make sure the body knows how much sweat to produce to cool the body down as well as fuel the body and concentrate the urine. If it has too much all the time it will not have to worry about equally distributing these things and then will cause the person to have unequal levels of water output.

Week 7 - April 25-29: Reproduction

3-minute brainstorm: Rather than write what you know, write what you WANT to know.

What questions do you have about reproductive systems

I just want to know about evolution and are we evolving to not have to reproduce anymore by being involved with the other sex more and more because there is less need to reproduce on an overpopulated planet?

Group selection: individuals not groups

Sharks; parthenogenesis, female reproduction without males:lizards

ENERGY: Hypothesis: the reproductive systems play essentially zero role in providing, acquiring, or internally transporting energy or any components needed to process energy. The reproductive system is purely an energetic sink. Do you agree with this hypothesis? If not, why is it false? If you agree, explain how the idea that in every systems to this point energetic benefits have outweighed energetic costs doesn't apply to the reproductive system.

No i do not agree! I think the reproductive system helps balance out our hormones and helps us survive. It keeps us healthy and maintains metabolic rates.

Are reproductive hormones: testosterone, cortisol suppresses immune system

CONTENT: Males and females are not that different. We all start with the same embryological tissues, and as adults rely on the same hormones. Make a table, a bullet list, or a your own series of drawings (or some combo of all methods), that illustrates the hormonal and anatomical analogies and homologies between adult females and adult males. For each hormone or structure, give a very brief definition of function in such a way that any functional similarities are also described.

CONTENT: As much as we talk about basic anatomy, all bodies are a little different. For example, the internal and external shape of the uterus can vary significantly from the basic anatomy discussed in the book. Two primary variations are caused when the embryological left and right mullarian ducts incompletely fuse to form the uterus. One anomaly is called a **bicornuate uterus**, and is analogous to the basal mammalian state of multiple uterine horns, each of which can house multiple developing embryos (think rodents and bunnies that have large litters!). In this case, rather than one large uterus, there are essentially two smaller uteri, each of which has all of the normal tissue layers in its walls. The second anomaly is called a **septate uterus**. In this case, the last bit of mixed connective tissue remaining between the fusing left and right ducts fails to dissolve during development. So again, instead of one large uterus, there are essentially two smaller ones. Notice, however, that the divider between the two is regular uterine wall in the bicornuate uterus, and is loose connective tissue in the septate uterus. These two anomalies can only be differentiated by an MRI, since an ultrasound cannot detect the differences in tissue, and the shapes are similar. Of note, there are a number of other anomalies representing more of a gradation than definitive categorical anomalies (as is common in many other conditions). These two anomalies may or may not cause complications; many women with one or the other never know they have it, and may have healthy pregnancies. Diagnosis may only occur when medically investigating the cause of a previous miscarriage.

+ Of note, septate conditions are more associated with early miscarriages (before 12 weeks), while bicornuate conditions are more associated with later miscarriages (after 20 weeks) and pre-term births (there is actually shockingly little research on this). Why do they affect pregnancy so differently if they both effectively create two smaller uteri? Explain how the wall of the uterus is related to the development of the embryo/fetus normally, including for labor and delivery. Then, why might the septum cause early miscarriages, but the bicornuate wall not? If the pregnancy makes it past the early stages, why is the septum less consequential later in the pregnancy, but the bicornuate condition can cause pre-term labor and birth?

Week 8 - May 2-6: Final

ENERGY: The theme this semester is the energy flow through the body, energetic costs, and energetic benefits. What did you learn about energy in the body? Do you think differently about energy now than before this class? Did anything surprise you? Did you start to look for energetic connections in other classes?

The major concepts that I learned about energy in the body is that we really do need a lot of it. It is so interesting how the body knows exactly how much we need to do certain activities and how eventually these sensors wear down with age.

I 100% think differently about energy after this class because of essential it is to our nature and everything around us. I find the heat aspect really interesting because we were really about to expand on the commonly known saying through each food chain layer 10% is lost through heat and then say why.

Depends on meat/plants: inverse transition at food chain only 10% becomes biomass
-90% "wasted"--> heat

Why there are so few predators: lost so much energy

I think the thing that surprised me the most was how successful I was in this class. It is obviously very different from any other class I have ever taken. However, I still continued to push myself and gained a true interest about the subject. A&P has such an inquisitive nature because we still know so little about ourselves (the bodies we live in!!! crazy.) I enjoy taking this course because I was able to question and challenge commonly known concepts. This helped me understand the why behind this science instead of yeah that is just how it is which has become what most people think about science. Everything has a reason, well not everything, some this stuff is just useless and hurts really bad when it stops working (appendix yeah i am talking to you).

I definitely was able to start looking for other energetic connections in other classes. I applied it in philosophy because we talked a lot about friendships and relationships and how much energy has a direct impact on our relations with others. How much are we willing to expend for others mentally, physically etc. In immunology it was interesting to think about the molecular level while also understanding why we feel so under the weather when we are sick because our immune system is working so hard and using up a lot of energy to fight off the infection.

Updating your model: In each of the previous weeks, you were asked to brainstorm ideas for how a system functions, and how that system is related to the energy in the body. Think about what you already knew at the start of the semester about bodily functions. What, to you, is the most important thing you learned...the most important change you made in your own mental model of how the human body works?

The most important mental change I made to my mental model definitely was an interest in the difference between male and females. Whether this be on a hormonal or molecular level I found it very interesting learning how we differ and how that affects our anatomy.

I also found the expulsion and reabsorption of nutrients in our digestive really interesting because of how it was all in effort to balance an equilibrium.

This was simultaneously about learning about autoimmune diseases in immunology.

<https://www.burkemuseum.org/news/which-came-first-grass-or-teeth-eat-it>

Self Reflection: We just rolled through a full semester of Human A&P in 7 weeks. Scroll back up to the start of this document, to the first question, where you defined “success” for you. Would you consider yourself “successful” in meeting your own definition? In what parts of the course have you been successful or unsuccessful? Why?

Beginning of the semester: Success to me in the class is being able to master this content and teach it to others and apply it where needed in my future goals and studies. I plan to apply to dental school after undergrad and hope that this background experience will be continued.

Now: I would consider myself successful in many within this course especially because my ability to apply this material to my future goals and within my life. I have been able to have a better understanding behind the why in anatomy and explain several common misconceptions to my friends.

Self Reflection: No matter how you answered the question above, you have probably surprised yourself one way or another. How?

I have surprised myself with my drive to watch all the videos and then take time to comprehend them to then go to class prepared for discussion. I find this very fruitful to be able to learn things at a baseline and then build on your understand through peer to peer discussion and provoking critical thinking questions from the teacher. (:

Final Assessment: This is it. Look at the [Letter Grade Descriptions](#) in the Start Here module in Canvas. These are the criteria you played a role in suggesting on the first day of classes, and had opportunity to edit. Use those criteria to assign a letter grade to yourself. No matter what letter grade you self-assign, provide clear and detailed evidence to support that grade.

- Adding knowledge of specific details to general understanding such that one can teach material to others,

I got to explain to my friends how covid affects our body/ immune system when they were changing the mask requirements.

<https://docs.google.com/presentation/d/1sa5kiDFJJstANhbFBVIA6VviLokEOHtY YWDzLuuvJCA/edit?usp=sharing>

- explain interconnectedness between concepts in the class or between class-topics and non-class topics,

I feel that I was most abpt doin this during our weekly meetings. It was interesting to ask questions about how everything is connect and then understand that really it is all connect through concepts like pressure, energy, and..

- develop novel (not provided in text by others) examples that aid in explaining concepts to others

I was able to formulate examples of how our systems could be affected in class through watching the videos to understand wholistically how each part of our body is affected.

*** example on the reproductive system: No i do not agree! I think the reproductive system helps balance out our hormones and helps us survive. It keeps us healthy and maintains metabolic rates. Are reproductive hormones: testosterone, cortisol suppresses immune system

** talking about frogs in class about how they can interchange between male and female

- apply understanding of general concepts and details to novel scenarios (e.g. case studies)

I was able to apply this information to my field of interests by thinking about the digestive system is affected by what our mechanical functions are made to do. EG cows, dogs, getting nutrients.

<https://docs.google.com/document/d/10MG-f0QdGN5OZxbXPMOQjniZTdj8um8Tm1QP6oVCJlo/edit?usp=sharing>

I deserve a A+ because of my perservance.
