

# What We Hope The Year Will Be Like

*An imagined semester of PBS, written as a letter home from a student who does not exist, describing the year we are building toward.*

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## PLEASE READ THIS FIRST

**This is fiction.** There is no such student. Nothing here is a record of anything that has happened, and no real student, family, grade, or conversation appears anywhere in it.

It is a hope, written in the first person because that is the honest way to describe what a course is supposed to feel like from the inside. The lessons, labs, dates, and assignments are the real planned curriculum. The student, the classmates, the group arguments, the mistakes, and the feelings are invented to show what the plan is meant to produce.

**About the partner activities.** The Cleveland Clinic onboarding and rotation, the John Carroll ethics Mondays, the research morning, and HOSA events appear here as part of the year we are planning. None of them is confirmed yet. Partner schedules are set outside this building, and any of these may move, change shape, or not run at all. Treat every partner activity in this document as an intention, not a promise.

Read it as a picture of the year we are aiming for, not a report on the year we had.

You keep asking what happens in this class and I keep saying "science stuff," which is not an answer. So I am writing the whole thing down. Every day, from the first one.

## WHY I SIGNED UP

I want to be a doctor. I have wanted that since my grandmother was in the hospital and I sat in that room for three days understanding almost nothing that anybody said about her. Everyone was kind and nobody could explain it in words I had. I decided then that I wanted to be the person who knows, and who can say it plainly to the family in the chair.

My friend in this class wants to be a nurse and says the same thing differently. She wants to be the one who is actually in the room. Between us that is most of why anybody takes this course. We are not here for a science credit.

Here is the short version before the long version. PBS is a forensics and medicine class where we start with a body and spend the semester figuring out how people get sick, how we know what we know, and who gets to decide. It runs on a rhythm. Mondays we argue about ethics. Tuesdays we learn the content. Wednesdays we are in the lab with gloves on. Thursdays we make sense of the data we took. Fridays we turn everything in. Once I understood that rhythm, the class got a lot less confusing.

Two things you should know up front. First, everything I turn in goes to one folder on the district OneDrive, and the file has to be named a specific way or it sits in a "Needs Attention" folder until Mr. Mendoza sorts it by hand. Second, there is a state test at the end called the WebXam, and we start preparing for it in week one, not in December.

## Week 1 · August 24 to 31

Orientation. No content yet, just learning how the class works.

### MON AUG 24 **Welcome, expectations, and how this class works**

First day. Mr. Mendoza did not hand out a syllabus and read it at us. He put a question on the board instead: how do we know what we know about the body, disease, and death? Then he said we would spend the semester answering it and that most of the answers would come from us, not him.

He walked us through the weekly rhythm and was honest that Mondays are the hardest to get used to, because on Mondays we argue instead of taking notes. He also said the Monday work is done with John Carroll University, but that their calendar and ours do not line up yet, so for the first couple of Mondays it is just us and him. He will announce when they join. I appreciated that he said it straight instead of letting us find out.

**Turned in:** exit ticket → Exit Tickets folder.

### TUE AUG 25 **How to use the class website**

Today was logistics and I was ready to be bored, but it turned out to matter. The class website has the day-by-day plan, so if I am absent I can see exactly what I missed instead of asking someone. It also has a glossary, practice, and the place where the tracker lives.

The part I did not expect: he showed us the exact filename format for anything we upload. Lastname\_Firstname, two underscores, the assignment title, two more underscores, then my student ID. He said the ID is the part the computer trusts, so if I spell my own name wrong it still gets to the right place, but if I skip the ID it goes into a review pile and gets graded late. I wrote the format on the inside cover of my notebook.

**Turned in:** exit ticket → Exit Tickets folder.

### THU AUG 27 **Cornell notes and the 6 Rs**

We learned the note system we will use all semester. Cornell notes, which means the page is split so questions live on the left and notes on the right, and a summary goes at the bottom. Then the 6 Rs: Record, Reduce, Review, Reflect, Recite, Revise.

Honestly it felt like busywork until he made us do the Recite part out loud with a partner, covering the notes side and answering from the question side. I could not do it. I had written everything down and still could not say any of it back. That was uncomfortable and also the point. He said the 6 Rs are how we study for the WebXam starting now, a little every night, rather than cramming in December.

**Turned in:** lab notebook page → Lab Notebooks folder.

## **FRI AUG 28 Lab safety, myPLTW, and how to submit**

Safety day. We went through the rules, the eyewash station, and the contract that you and I both have to sign before I am allowed to touch anything in the lab. That is the one I brought home for your signature. He was clear that no signature means no lab, and that it is not a formality.

We also logged into myPLTW, which is the national program software, separate from our class site. It tracks the official course activities. So there are two systems: myPLTW for the program, and our own site for the daily plan and what to turn in.

**Turned in:** pre-lab → recorded in Class Records.

## **MON AUG 31 WebXam pretest and goal setting**

We took the WebXam pretest today, which is the state exam we sit in the spring, given to us cold in week one. I did not do well and neither did anyone else, which was the point. He said the pretest is not a grade, it is a baseline, and in December we compare.

Then we set a goal and wrote down how we would get there. Mine is fifteen minutes of review a night using the question side of my Cornell notes. He said the students who do badly on the WebXam are almost never the ones who cannot understand it, they are the ones who met the content once in September and never went back.

**Turned in:** WebXam practice → recorded in Class Records.

### **THAT WEEK AT HOME**

Not much yet. Get the safety contract signed, set up the notebook with the Cornell split, and start the fifteen minutes a night. The first week is light on purpose. He warned us it does not stay that way.

### **AFTER SCHOOL · SIGNING UP**

Club sign-ups were this week and I put my name down for three things. HOSA, which is the health professions student organization and the one that actually matters for what I want to do. Chess, because my friend made me. And I asked Mr. Mendoza about the Cleveland Clinic onboarding, because there is a pathway where students do a rotation there and I want to be in it.

He said the Clinic onboarding is a real process with real paperwork and it takes weeks, so start early. That is the first time school has felt like it connects to an actual hospital.

## Week 2 · September 1 to 8

Unit: course launch. The first real week, and the first Monday argument.

### TUE SEP 1 **Bioethics of evidence** ETHICS DAY

This was the first Monday and John Carroll was not here yet, so Mr. Mendoza ran it himself. He opened with a real case: forensic labs have sent innocent people to prison on evidence that everyone trusted at the time and that later turned out to be wrong.

Then the question. Can a lab result be wrong, and if it is, whose fault is it? The machine, the analyst, or the system that trusted it without checking? I said the machine at first, because a machine does not have opinions. Someone in my group pointed out that a person loads the sample, a person labels it, and a person decides which test to run, so the machine only ever answers the question a human asked it. I did not have a comeback. I changed my position mid-debate, which felt like losing until he said that changing your mind in the face of a better argument is the entire skill.

We wrote our first CER, which is Claim, Evidence, Reasoning. Three to five sentences. Mine was bad. The claim and evidence were fine and the reasoning sentence was really just my claim again in different words. He said that is the most common mistake and we will write dozens of these.

**Turned in:** CER → Claim Evidence Reasoning folder.

### THU SEP 3 **Lab safety and SDS**

Content day. Four categories of personal protective equipment and when each is required, then Safety Data Sheets, which are the documents that come with every chemical. They have sixteen sections and we had to find the hazard section and the first aid section fast.

We each got a chemical and made a lookup card: name, hazard class from section two, required PPE from section eight, first aid. The point is that in a real lab you do not get to touch anything until you can do this. He framed it as earning entry rather than as a rule, which landed better.

**Turned in:** SDS vocabulary card → recorded in Class Records.

### AT HOME, THE NIGHT BEFORE FRI SEP 4 **PPE and notebook practical** LAB

First real lab day. Three stations, each with a different hazard, and at each one I had to put on the correct PPE and have a partner verify before I could proceed. My partner caught that I had gloves on but had not tied my hair back. Small thing, and it would have been a real problem at the station with the open flame.

That partner check is built into the procedure on purpose. He said the reason labs use two sets of eyes is not that people are careless, it is that nobody can see their own blind spot.

Then the notebook page, written to standard operating procedure format: purpose, materials, steps, PPE chosen, the SDS lookup. He made the point that two scientists running the same experiment usually get different results not because one is smarter but because one documented properly.

**Turned in:** notebook SOP page → Lab Notebooks folder.

#### FRI SEP 4 **Graphing and statistics**

We took Wednesday's measurements and turned them into something defensible. Mean, median, range, standard deviation, then a graph with the axes actually labeled and units on them.

The thing that stuck: he showed two data sets with the same average that told completely different stories, because one was tightly clustered and one was all over the place. The average hid it. The spread revealed it. I had never thought of standard deviation as anything but a formula before, and now it is the number that tells you whether to trust the average.

My struggle today was the standard deviation calculation. I got it wrong twice because I was squaring after summing instead of before. A girl at my table walked me through it on scratch paper and it finally clicked.

**Turned in:** data table and graph → Data Tables folder.

#### AT HOME, THE WEEKEND BEFORE TUE SEP 8 **Submit launch evidence**

Friday is packet day. Everything from the week goes in together: signed safety contract, the SDS card, the notebook SOP page, the data table with statistics, the graph.

He compared it to forensics, where a missing signature or one undocumented step can get otherwise perfect evidence thrown out of court. The tracker works the same way. Everything has a place and a missing piece is a missing piece regardless of how good the rest is.

I was missing the SDS card. I had done it, I just never uploaded it. Took two minutes to fix once I noticed, and I would not have noticed without the checklist.

**Turned in:** full week packet → recorded in Class Records.

#### **THAT WEEK AT HOME**

About twenty five minutes a night. Ten to fifteen on the Cornell review, the rest finishing whatever did not get done in the block. The CER on Monday took me longer than it should have because I kept rewriting the reasoning sentence.

Saturday I spent about forty minutes going back over PPE and SDS sections, because those are the kind of thing that shows up on the WebXam and is easy to forget once we move on. That is the pattern he wants: the weekend is for the stuff from two weeks ago, not the stuff from Friday.

## Week 3 · September 8 to 14

Unit: the scene. Labor Day Monday is a district holiday, so the week runs Thursday, Friday, then Tuesday.

**A note on the schedule.** Labor Day was Monday, so we lost the ethics day and Mr. Mendoza moved that debate to the following Monday. He also told us John Carroll still is not joining yet and that he would announce the start date once the two calendars line up. Their semester does not run on the same weeks ours does.

### TUE SEP 8 **Ethics of the scene** ETHICS DAY

The question today: when does collecting evidence cross the line into destroying it? To get a fiber off a carpet you have to move the carpet. To swab a surface you have to touch it. Every piece of evidence you take changes the scene you took it from.

I argued for collecting aggressively, because evidence you did not collect is evidence you do not have. The other side argued for preserving the scene untouched, because once you have contaminated it you can never go back and the defense will say so. Neither side wins cleanly, which I am starting to notice is true of every Monday question.

**Turned in:** CER → Claim Evidence Reasoning folder.

### THU SEP 10 **Documentation and custody**

The four documentation steps in order: photograph, sketch, log, collect. Photograph first, because the moment you sketch you have already spent time in the room, and the moment you collect you have changed it.

Then chain of custody, which is the record of every person who has touched a piece of evidence from the scene to the courtroom. Every transfer has to capture who, when, and why. If there is a gap, the evidence is compromised, even if nothing actually went wrong. He said the line to remember is that in forensic science the documentation is the evidence.

**Turned in:** exit ticket → Exit Tickets folder.

### FRI SEP 11 **Scene documentation lab** TEAM LAB

Mock crime scene, and this one was a genuine team job with assigned roles. Photographer, sketcher, logger. I was the logger, which sounded like the boring one and turned out to be the one everybody depends on, because if the log does not match the photographs then none of it holds together.

We had a problem. Our photographer shot the whole scene before our sketcher had set the scale marker, so the first set of photos had no reference for size. We did not catch it until the sketch did not match. We had to decide whether to reshoot, which meant admitting we had already disturbed the scene, or note the limitation honestly in the log. We reshot and logged both, which took most of the period and meant our packet was rushed.

Mr. Mendoza said that was the most useful mistake in the room, because the fix was not better photography, it was talking to each other before starting. We had three people working in parallel and nobody sequencing.

**Turned in:** team scene packet → Lab Reports folder, with each of our roles on the cover.

## MON SEP 14 **Analyze trace evidence**

We took our observations under magnification and compared them to reference characteristics, then wrote a CER about what the trace evidence suggests about the scene.

The hard part was the last step, which was auditing our own chain of custody and asking whether it would survive someone attacking it. Ours would not, because of the photo problem on Wednesday. Writing down honestly that our own evidence had a weakness felt bad, and he said that is exactly what a real analyst has to do, because the alternative is being surprised by it in court.

My CER is getting better. The reasoning sentence now explains why the evidence supports the claim instead of just restating it. That took three weeks.

**Turned in:** CER → Claim Evidence Reasoning folder.

### **THAT WEEK AT HOME**

Heavier, maybe forty minutes a night, mostly because the team packet spilled over. I had to message my group Wednesday night to sort out who was writing which part of the cover page. That is new for me, and I am not great at it yet.

Weekend was the four documentation steps and chain of custody until I could say them without looking. Those are WebXam facts, clean and testable, and the Recite step is the only reason I know them now.

### **AFTER SCHOOL · CHESS**

Chess on Thursday. I am not good. I lost twice to a sophomore who did not gloat, which somehow made it worse and also made me want to come back. What I noticed is that the part of chess I am bad at is the same part I am bad at in the lab: I move first and think second.

Somebody pointed out I was playing three moves ahead on my own pieces and zero moves ahead on theirs. That is exactly what happened with our scene photos on Thursday, where we all worked in parallel and nobody looked at what anyone else was doing.

## Week 4 · September 15 to 21

Unit: evidence and biomolecules. Chemistry arrives.

### TUE SEP 15 **Ethics of testing** ETHICS DAY

Today's question: should investigators run every test a sample allows, or only the tests their hypothesis calls for? It sounds obvious until you learn that samples are finite. Every test consumes a little. Run everything and you might use up the sample before you get to the test that mattered.

I argued for testing exhaustively because you cannot un-miss something. The counterargument was sharper than I expected: testing without a hypothesis is fishing, and if you run enough tests something will come back positive by chance alone. That is a real statistical problem, not a debate trick, and it changed how I think about the word "thorough."

Mr. Mendoza announced at the end that John Carroll is confirmed to start next Monday. He said their philosophy program runs these discussions with students and that our format will not change much, we will just have someone else asking the questions.

**Turned in:** CER → Claim Evidence Reasoning folder.

### AT HOME, THE NIGHT BEFORE THU SEP 17 **Biomolecules and design**

The four biomolecules: carbohydrates, lipids, proteins, nucleic acids. Each one has an indicator test, which is a chemical that changes color when that molecule is present. Benedict's for reducing sugars, iodine for starch, Biuret for protein, Sudan for lipids.

Then experimental design, which is where I got tripped up. Independent variable, dependent variable, controlled variables. I kept mixing up dependent and controlled. The way it finally stuck: the dependent variable is the one I measure, the controlled variables are the ones I refuse to let change. We built a pre-lab design sheet for tomorrow so we walk in knowing what we are doing instead of reading instructions at the bench.

**Turned in:** pre-lab design sheet → recorded in Class Records.

### THU SEP 17 **Biomolecule and tox data** LAB

Indicator tests on unknown samples, with positive and negative controls in every run. The controls are the part I would have skipped if nobody made me, and they are the part that makes the whole thing mean anything. A negative control that turns positive means your reagent is contaminated and every result you got today is garbage.

Which is what happened to the group next to us. Their negative control came up positive for protein and they had to throw out the whole run and start over with fresh tubes. They were annoyed and Mr. Mendoza was almost cheerful about it, because they caught it. He said the dangerous version is the group that never runs a control and reports the contaminated result as a finding.

**Turned in:** indicator-test data table → Data Tables folder.

## FRI SEP 18 **Analyze tox results**

We compared unknowns against our controls and wrote a CER on which biomolecules are present in each. Then the toxicology piece, which was a dilution series showing dose response. Same substance, increasing concentration, and you can watch the effect climb.

The idea underneath is that the dose makes the poison. Almost anything is harmless at a low enough concentration and dangerous at a high enough one. That reframed a lot for me, because I had been thinking of chemicals as either safe or not safe.

**Turned in:** CER and annotated data table → Claim Evidence Reasoning folder.

## AT HOME, THE WEEKEND BEFORE MON SEP 21 **Submit evidence data**

Packet day. Data table with controls, dose response description, CER, limitations. The limitations section is now a required part of everything we hand in, and I have stopped resenting it. Writing "my negative control was clean so I trust these results" is a sentence that means something.

**Turned in:** full week packet → recorded in Class Records.

### THAT WEEK AT HOME

Thirty to forty minutes a night. The four biomolecules and their indicator tests are pure memorization, so I made cards and drilled them. Those are close to guaranteed WebXam questions.

Weekend I went back to week two, the statistics, because I could feel it slipping. That is the whole point of the review schedule and it is the first time I have actually felt it working.

## Week 5 · September 21 to 28

Unit: the morgue. John Carroll joins on Monday.

### MON SEP 21 **Ethics of autopsy** ETHICS MONDAY

John Carroll started today. The format was familiar but the questioning was different. They do not argue back and they do not tell you when you are right. They ask you what you mean, and then they ask again about the answer you just gave, until you either find the bottom of your position or find out you did not have one.

The question: whose body is it after death, and who decides? Should an autopsy require family consent? I said the family should decide because the person is gone and the family is who is left. I got asked whether that means a family could block an autopsy that would reveal a murder. I said no, obviously not, and then had to explain why my rule had an exception I had not mentioned. That was uncomfortable in a way I am still thinking about.

It also connects to a real tension: individual rights, family grief, and society's need to know how people die, all pulling against each other.

**Turned in:** CER → Claim Evidence Reasoning folder.

### WED SEP 23 **Body systems and tissues**

Four primary tissue types: epithelial, connective, muscle, nervous. Every organ in the body is built from combinations of those four. That is a genuinely surprising fact and it made the body feel much more knowable than it did an hour earlier.

Then how a pathologist reads tissue damage to work out what went wrong. The logic is that you learn what normal looks like so thoroughly that abnormal announces itself.

**Turned in:** exit ticket → Exit Tickets folder.

### THU SEP 24 **Tissue and heart lab** LAB

Microscopes and histology slides, then gross heart anatomy. I had to identify all four tissue types on slides and sketch each with the magnification labeled and one identifying feature marked.

Getting the microscope focused at high power took me most of the first twenty minutes. I kept driving the objective down past the specimen. My partner had done microscopy in another class and showed me to focus at low power first, center the thing I want, then move up magnification. Obvious in retrospect. I was too proud to ask for about ten minutes longer than I should have been.

The heart was the part I will remember. Four chambers, two circuits, and once you see the muscle wall thickness difference between the left and right ventricle, the reason for it is unavoidable.

**Turned in:** notebook pages with four sketches and heart diagram → Lab Reports folder.

## **FRI SEP 25 Analyze histology evidence**

We compared our sketches to reference histology images and wrote a CER about what tissue damage could indicate as a cause of death. The reference comparison is the whole method. You cannot identify disease without knowing what healthy looks like, so a pathologist is really recognizing what is absent or distorted.

My sketches were rougher than the references and it was hard to tell whether a difference was real or just my bad drawing. I wrote that in the limitations. Mr. Mendoza said noticing that your own instrument is the weak link is a legitimate finding.

**Turned in:** CER and annotated notebook page → Claim Evidence Reasoning folder.

## **AT HOME, THE WEEKEND BEFORE MON SEP 28 Submit morgue evidence**

Four labeled histology sketches with magnification, the heart diagram with chambers and vessels, the CER. This packet connects the microscopic to the macroscopic, which is the actual job: tissue under a lens explaining an organ you can hold.

**Turned in:** full morgue packet → recorded in Class Records.

### **THAT WEEK AT HOME**

Around forty minutes a night, plus redrawing two histology sketches because the first versions were not good enough to compare against anything. The four tissue types and the heart chambers are the WebXam material here and I drilled both.

Weekend I did the heart from memory three times until I could label it without the diagram.

## Week 6 · September 28 to October 6

Unit: open investigation. Everything from Unit 1 comes together.

### MON SEP 28 **Ethics of conclusions** ETHICS MONDAY

How much evidence is enough to name a cause of death? This one had teeth because we are about to do exactly that.

The risk on one side is concluding too early and being wrong in a way that ruins someone's life. The risk on the other side is never concluding at all, which sounds cautious and is actually its own failure, because a family gets no answer and a danger goes unaddressed. I wanted a rule and the discussion would not give me one. What I got instead was the idea of convergent evidence: no single test carries a conclusion, but several independent lines pointing the same direction can.

**Turned in:** CER → Claim Evidence Reasoning folder.

### WED SEP 30 **Synthesize all evidence**

We have four evidence streams now: the scene, the lab work, the suspect information, and the autopsy. Today was about weighting them, because they are not equally reliable and pretending they are is how you get a wrong answer confidently.

I built a planning sheet with a column per stream, the specific items I have from each, and how much I trust it. Writing down that my own trace evidence was weak because of our photo problem back in week three was annoying and correct.

**Turned in:** evidence planning sheet → recorded in Class Records.

### THU OCT 1 **Build the evidence board** TEAM

Best day of the semester so far. Our team put every piece of evidence on a board by stream, then drew links showing what corroborates what and what conflicts. Then we flagged the gaps.

The arguing was real. Two of us read the same tissue finding differently, and instead of one person winning we ended up drawing both interpretations on the board with a conflict marker between them. Mr. Mendoza said that was the right call, because a board that hides a disagreement is lying.

Seeing it laid out spatially did something no list had done. Two streams clearly converged. One had a hole in the middle that none of us had noticed while the evidence lived in separate notebooks.

**Turned in:** board photo and notebook entry → Lab Notebooks folder.

## FRI OCT 2 **Write the report CER**

The big one. A full investigative CER with a cause-of-death claim, one piece of evidence cited from each of the four streams, reasoning showing how they converge, and an honest limitations section. This is the longest thing I have written in the class.

We peer reviewed before submitting. The person who read mine said my reasoning explained three of my four evidence streams and just listed the fourth. She was right. I had cited the suspect information and never said why it mattered.

**Turned in:** draft investigative CER → Claim Evidence Reasoning folder.

## AT HOME, THE WEEKEND BEFORE TUE OCT 6 **Submit investigation report**

Board photo and the final report. This closes Unit 1. Six weeks ago I did not know what a CER was and today I wrote a multi-stream investigative argument with a limitations section. I want that on the record because in the middle of it I did not feel like I was learning anything.

**Turned in:** full investigation packet → recorded in Class Records.

### **THAT WEEK AT HOME**

The heaviest week yet, close to an hour some nights, mostly the report. I also had two group message threads going, one about who was photographing the board and one about the conflict marker disagreement, which we ended up settling in person on Thursday because text was making it worse.

Weekend was lighter on new work and heavier on review, since Unit 1 is done and all of it is testable. I went back through every Cornell page from week one and did the Recite step on all of them. I could not answer maybe a fifth of my own questions, which told me exactly what to restudy.

## Week 7 • October 6 to 12

Unit: clinical communication. Unit 2 begins and we move from the dead to the living.

### TUE OCT 6 **Ethics of privacy** ETHICS DAY

Should a doctor ever share patient information without consent? We learned what HIPAA protects and then immediately learned that it has public-health exceptions, which is where the argument lives.

My position was strict privacy, because the whole doctor relationship depends on being able to say true things without them leaving the room. Then someone raised a contagious outbreak, where staying silent protects one person and endangers many. I still lean toward privacy, but I can now state the strongest version of the other side, which is the thing they keep pushing us toward.

**Turned in:** CER → Claim Evidence Reasoning folder.

### AT HOME, THE NIGHT BEFORE WED OCT 7 **Vital signs and HIPAA**

The four vital signs, their normal adult ranges, and how homeostasis holds each one inside its range. Then HIPAA basics: what is protected and who has to comply.

I built the measurement plan for tomorrow: each vital sign, the instrument, the unit, the normal range, and one way the measurement could go wrong. That last column is the one that made me actually think.

**Turned in:** vital-signs measurement plan → recorded in Class Records.

### WED OCT 7 **Vital signs practical** LAB

Measuring on a real person for the first time, which is different from measuring a sample. My partner is a person who could tell I was nervous, and that changed his pulse, which is itself a measurement error worth noting.

Blood pressure was hard. I could not hear the sounds through the stethoscope on my first two tries and had to have it demonstrated twice. Getting the cuff position right and the deflation rate slow enough takes practice I did not have. I got a reading on the third attempt and recorded both the failed attempt and the successful one, because the SOP says document what happened, not what you wish had happened.

Then everything went into a simulated electronic medical record with correct units.

**Turned in:** simulated EMR record → Data Tables folder.

### THU OCT 8 **Analyze vital signs**

CER on whether my partner's readings suggest homeostasis is maintained, comparing each against its normal range, then explaining how an out-of-range value connects to a feedback mechanism.

The bigger idea is that one reading is a snapshot. It tells you where the body is at that instant, not where it is heading. Only repeated measurements give you a trend, which is the whole reason Wednesday's single measurement cannot carry much weight.

**Turned in:** CER → Claim Evidence Reasoning folder.

## AT HOME, THE WEEKEND BEFORE MON OCT 12 **Submit clinical evidence**

Packet day, and this one had no separate turn-in because the deadline shifted with the schedule. We used the block to finish the EMR record and the CER and get both uploaded.

**Turned in:** nothing new. Catch-up and cleanup block.

### THAT WEEK AT HOME

Around thirty five minutes a night. The four vital signs with their normal ranges and units are flat memorization and they will be on the WebXam, so those got cards.

I also practiced blood pressure on you at the kitchen table, which is why I asked. I needed a second arm and repetition. Thank you for sitting still four times.

### AFTER SCHOOL · HOSA

HOSA meeting Wednesday. We are picking competitive events and I am looking at the medical terminology one, partly because it is the closest thing to pure studying and I am good at that, and partly because the vocabulary overlaps almost entirely with what is on the WebXam. Two things at once is the only way I get everything done.

We also spent twenty minutes on the Cleveland Clinic onboarding as a group, because half of us are stuck at the same step. There is a background module and a set of forms and you have to do them in order. Doing it together in one room was much faster than six of us being confused separately.

## Week 8 · October 12 to 20

Unit: clinical data. Numbers over time instead of numbers at a moment.

### MON OCT 12 **Ethics of monitoring** ETHICS MONDAY

Do wearables and constant health monitoring make us healthier or just more anxious? This one split the room in a way the others had not, and it was the first Monday where I thought the class was mostly wrong.

Most people said more data is obviously better. I said more data is only better if someone knows what to do with it, and that a number you cannot act on mostly produces worry. The pushback was that I was underestimating patients. Fair. But the underlying point held up: the benefit is not in collecting the data, it is in the interpretation, and the interpretation is the part nobody guarantees you.

**Turned in:** CER → Claim Evidence Reasoning folder.

### WED OCT 14 **Bloodwork and ranges**

Common blood panels: complete blood count, glucose, cholesterol, and the normal ranges for each. Then how chronic disease monitoring uses repeated tests over time rather than one draw.

Learning that the same glucose number can be fine or alarming depending on whether the patient just ate reframed what "normal range" even means. Context is part of the measurement.

**Turned in:** exit ticket → Exit Tickets folder.

### THU OCT 15 **Simulated bloodwork data** LAB

We worked a simulated patient dataset with glucose and cholesterol across multiple time points and built a labeled time-series graph for one marker.

Graphing time series is harder than the bar graphs from week two. My first attempt had uneven time spacing on the x-axis, which made a steady rise look like a sudden spike. A visually wrong graph that is technically made of correct numbers is a genuinely alarming thing to have produced.

**Turned in:** data table and time-series graph → Data Tables folder.

### FRI OCT 16 **Analyze chronic trends**

CER on whether the patient's condition is improving or worsening, using the graph as evidence, plus an explanation of how a single reading could mislead where a trend would not.

This is the payoff of Monday's argument. The data alone did not answer the question. The trend direction did.

**Turned in:** CER → Claim Evidence Reasoning folder.

### AT HOME, THE WEEKEND BEFORE TUE OCT 20 **Submit clinical data**

Time-series graph with labeled axes, units, and the normal range marked as a band, plus the trend CER.

Marking the normal range as a band behind the line is a small thing that makes the graph readable at a glance, and I would not have thought of it.

**Turned in:** full clinical-data packet → recorded in Class Records.

#### THAT WEEK AT HOME

Thirty to forty minutes. I rebuilt the time-series graph twice at home to get the axis spacing right. Blood panel markers and their ranges went on cards with the vital signs.

Weekend review reached back to the biomolecule tests, which I had half forgotten again. Second pass was much faster than the first, which he said is exactly what should happen.

## Week 9 • October 20 to 26

Unit: DNA and protein. The molecular level.

### TUE OCT 20 **Ethics of genetic data** ETHICS DAY

If your DNA reveals a risk, do your relatives have a right to know? Genetic information is strange because it is partly shared. A result about me is partly a result about you.

This was the hardest Monday so far and the first one that felt personal rather than academic. I argued for individual privacy and then had to sit with the fact that under my own rule, someone could learn they carry something serious and say nothing to a sibling who could act on it. I did not resolve it. My CER says so, and Mr. Mendoza said an honest unresolved position beats a tidy fake one.

**Turned in:** CER → Claim Evidence Reasoning folder.

### AT HOME, THE NIGHT BEFORE WED OCT 21 **DNA, genes, and protein**

DNA structure, chromosomes, genes, then the central dogma: DNA to RNA to protein, by transcription and translation. Then how a mutation changes a protein and can cause disease.

I built the pre-lab mutation plan for tomorrow: a nine-base template, the mRNA it transcribes to, the amino acids it translates to, and the point mutation I planned to introduce. Doing it on paper first meant tomorrow was checking my work rather than guessing.

**Turned in:** pre-lab mutation plan → recorded in Class Records.

### WED OCT 21 **DNA and protein modeling** LAB

We modeled transcription and translation with physical pieces, then introduced a point mutation and tracked what happened downstream.

Mine changed one base and the amino acid did not change at all, which I thought meant I had done it wrong. I had not. The genetic code is redundant, so several codons can code for the same amino acid, and some mutations are silent. Finding that out by accident, from my own model, is far better than being told it.

The person next to me changed one base and got a stop codon, which ends the protein early. Same size change, completely different consequence. We compared and it made the point better than the lesson would have alone.

**Turned in:** notebook entry with both sequences → Lab Reports folder.

### THU OCT 22 **Analyze the mutation**

CER on how the mutation affects the protein and what diagnosis it might relate to. Severity depends on where the mutation falls, which amino acid changes, and what that amino acid was doing in the folded protein.

The model's limitation is that it is flat. Real proteins fold in three dimensions, and whether a substitution matters often depends on the fold, which our paper strips cannot show.

**Turned in:** CER → Claim Evidence Reasoning folder.

AT HOME, THE WEEKEND BEFORE MON OCT 26 **Submit DNA evidence**

Sequences, mutation analysis, CER. The central dogma is the spine of everything after this, so this packet is one I will come back to before the WebXam.

**Turned in:** full DNA packet → recorded in Class Records.

**THAT WEEK AT HOME**

Forty five minutes most nights. Transcription and translation need practice, not reading, so I did template-to-protein conversions until the codon chart stopped being confusing.

Weekend was the biggest single block yet, about ninety minutes, because I am at the halfway point and wanted a full pass over Units 1 and 2. That is the review he told us to build in September and it is the reason the halfway point does not feel like a cliff.

**WHY I KEEP GOING**

Halfway. I want to write down that I nearly dropped this class in September. It was harder than I expected and I was the only one in my group who had not taken a science elective before.

What kept me was the vital signs week. I took a blood pressure reading, badly, three times, and on the third one I heard it. That is a thing a nurse does every day and I did it with my own hands. Since then the hard parts have felt like the price of the thing I want rather than proof I do not belong here.

## Week 10 · October 26 to November 4

Unit: genetic risk. Inheritance, karyotypes, and probability.

### MON OCT 26 **Genetic testing ethics debate** ETHICS MONDAY

A case where a couple learns both partners may carry a recessive disease allele. Should they pursue carrier screening and prenatal testing? Who decides?

We had to define the terms before arguing, which slowed everyone down usefully: carrier, recessive inheritance, genetic risk, informed consent. It is hard to have a real argument about informed consent when half the room thinks it means signing a form.

The exit ticket was different today. Instead of defending my position, I had to write down the strongest argument against it. That is much harder and I think it is the point of the whole Monday structure.

**Turned in:** exit ticket → Exit Tickets folder.

### AT HOME, THE NIGHT BEFORE TUE OCT 27 **Karyotype and inheritance notes**

Chromosome number, autosomes versus sex chromosomes, and how a karyotype is built from a stained metaphase spread. Then aneuploidy, where the chromosome count is wrong, such as trisomy 21.

These notes stay in my notebook for tomorrow rather than being turned in, which is a change. Some days the work is preparation and the deliverable comes later.

**Kept in the notebook** for Wednesday's lab.

### TUE OCT 27 **Karyotype case analysis** LAB

This one was individual, not team, and it was fiddly in a way I did not expect. You physically cut out chromosome images and sort them by size and centromere position into 22 pairs plus the sex chromosomes.

Sorting by size sounds easy. It is not, because several pairs are close enough that you are squinting at centromere position to break the tie. I misplaced a pair, which shifted two others, and did not notice until my final count was off. Had to redo about a third of it.

The abnormality in my case was visible once the sort was right, and completely invisible before. Which is the lesson: the diagnostic power is in the procedure, not in the looking.

**Turned in:** mounted karyotype and abnormality statement, handed to the collection tray → Lab Reports folder.

## WED OCT 28 Pedigree and risk CER

We built a pedigree from a case history using the standard symbols, traced the inheritance pattern, labeled carriers across two generations, then used a Punnett square to calculate the probability that the next child is affected.

This is the first CER where the claim is a number. Not "there is a risk" but a specific probability with the pedigree and the square as evidence. Quantifying it instead of estimating it changes the conversation entirely.

My limitation line: a Punnett square gives the probability for each pregnancy independently, so a family that already has an affected child does not have a lower chance next time. That is a genuinely counterintuitive thing and I got it wrong first.

**Turned in:** CER → Claim Evidence Reasoning folder.

## AT HOME, THE NIGHT BEFORE THU OCT 29 Submit tracker and evidence

Karyotype, pedigree, and CER assembled into one labeled file, checked against the rubric, with sources cited and unresolved limitations noted in a closing line.

The tracker now asks for a self-assessed confidence rating. Rating my own confidence honestly is harder than doing the work. I put myself lower on pedigrees than on karyotypes, which is accurate and tells him where I need help.

**Turned in:** full genetic-risk package → recorded in Class Records.

### THAT WEEK AT HOME

Forty five minutes, plus extra on Wednesday redoing the karyotype sort. Punnett squares need repetition so I did practice problems until the independent-probability thing stopped tripping me.

Weekend was inheritance patterns, which are heavily tested. Dominant, recessive, sex-linked, and how each one looks on a pedigree.

Unit: diagnostic workup. A short week, and the class had to absorb it.

**A note on the schedule.** We were out Monday and Tuesday, so this unit got compressed into three days. Mr. Mendoza did not cut content, he moved the ethics debate to Friday and pushed the team project earlier. It made the week feel rushed and he acknowledged that rather than pretending it was fine.

## THU OCT 29 **Diagnostic disclosure debate** ETHICS DAY

The ethics day, moved to Friday. How much diagnostic uncertainty should a clinician share with a new patient? Full disclosure or staged disclosure?

I went in thinking full disclosure obviously, because it is the patient's body and their information. The counterpoint that stuck: telling someone about a possibility you have not confirmed can cause real harm from a thing that turns out not to exist. Informed consent is not just a signature, it is a decision about how much uncertainty a person can hold.

We also had to submit the recommendation CER this week, which I finished at home Thursday night.

**Turned in:** exit ticket → Exit Tickets folder, plus the workup package.

## AT HOME, THE NIGHT BEFORE WED NOV 4 **Workup components notes**

A diagnostic workup is a structured data collection process where each component answers a different clinical question. Patient history, vital signs, bloodwork, genetic screening. We mapped each one to the question it answers and recorded reference ranges.

This pulled together everything from Unit 2. The vital signs from week seven, the blood panels from week eight, the genetics from weeks nine and ten, all showing up as parts of one process. That was the moment the second unit clicked as a unit instead of four separate topics.

**Kept in the notebook** for the team project.

## WED NOV 4 **Clinical diagnosis team project** TEAM

Teams synthesizing a full patient chart into a ranked differential diagnosis. We started by writing our own SOP for reviewing the chart in a fixed order, which sounded bureaucratic and turned out to be the reason we did not miss anything.

We disagreed hard on the ranking. Two of us weighted the bloodwork most heavily, one weighted the patient history, and the history person turned out to be right, because a detail in the history explained an out-of-range lab value that we had been treating as the main finding. He had said it early and we had talked over him. We ranked it his way in the end and I apologized, which I would not have done in September.

Clinical diagnosis being a team sport is not a motivational line. Our accuracy genuinely came from having three people who read the same chart differently.

**Turned in:** shared team evidence table with ranked differential → Data Tables folder.

### THAT WEEK AT HOME

More than usual, close to an hour, because three days had to carry five days of work. The recommendation CER got written at home rather than in class.

The compressed week hurt my review time. I did the nightly fifteen minutes twice out of three nights and skipped the weekend pass, and I could feel it the following week. Writing this down so I remember that skipping review is a decision with a cost.

#### AFTER SCHOOL · CLEVELAND CLINIC

My Clinic onboarding cleared this week. Background check, the modules, the health requirements, all of it signed off. It took nine weeks from when I started, which is why he told us to start in August.

What it means is that in the spring I can be in an actual hospital, in an actual department, wearing an actual badge. I read the confirmation twice. I want you to understand that this is the first time anything I have done in school has produced something that exists outside of school.

## Week 11 • November 6 to 13

Unit: infection. Unit 3 begins.

### FRI NOV 6 **Hospital infection ethics debate** ETHICS DAY

Should hospitals be required to publicly report their infection rates? A case about a hospital with rising nosocomial infections, which means infections people catch in the hospital itself.

Transparency and accountability on one side, reputational harm on the other, and a real second-order problem underneath: if reporting is punished, hospitals have an incentive to test less, and you end up with better numbers and worse care. That argument came from someone else and it was the best point made in the room all semester.

**Turned in:** exit ticket → Exit Tickets folder.

### TUE NOV 10 **Chain of infection notes**

The six-link chain of infection, from the infectious agent through its reservoir all the way to a susceptible host. The useful part is that you do not have to break all six. Break any one link and transmission stops.

We mapped PPE and aseptic technique onto specific links, which retroactively explained the safety work from week two. Gloves are not a general precaution, they interrupt a specific link.

**Kept in the notebook** for the infection-control case.

### THU NOV 12 **Infection-control case**

We analyzed a hospital scenario, traced the chain of infection for one patient, and found the weakest link.

The weakest link in my scenario was not the dramatic one. It was hand hygiene compliance between two routine tasks, not a procedure or a piece of equipment. The boring failure was the one that mattered, which I gather is usually true.

**Turned in:** written analysis → recorded in Class Records.

### FRI NOV 13 **Infection-control CER**

A CER naming the highest-priority control, citing chain-of-infection and patient-context evidence, and reasoning through how the control interrupts transmission.

He was specific that this is not a list of hygiene tips. It has to name a mechanism, predict an outcome, and admit uncertainty. "Wash your hands more" is not an argument. "Hand hygiene between these two specific tasks interrupts the transmission link because of this, and here is what I cannot rule out" is one.

**Turned in:** CER → Claim Evidence Reasoning folder, plus the unit package.

#### THAT WEEK AT HOME

Back to about forty minutes and I made up the weekend review I skipped last week. The six links of the chain of infection are the highest-value memorization in this unit and I drilled them until I could recite the chain in order both directions.

I also went back to the vital signs and blood ranges, because Unit 3 assumes them and I had let them fade.

## Week 13 • November 16 to 24

Unit: outbreak. Epidemiology, and the first time the class felt like a real job.

### MON NOV 16 **Outbreak privacy debate** ETHICS MONDAY

How much patient identity information should be shared during an active outbreak investigation? Contact tracing saves lives by sharing data, and every data point shared belongs to a person.

This is the third privacy debate this semester and my position has genuinely moved across them. In October I was a strict privacy person. I am now somewhere more uncomfortable, where I think the answer depends on what is actually being shared and with whom, which is a less satisfying position and I think a more honest one.

**Turned in:** exit ticket → Exit Tickets folder.

### AT HOME, THE NIGHT BEFORE WED NOV 18 **Epidemiology tools notes**

Line lists, spot maps, epidemic curves, and the difference between incidence and prevalence. Incidence is new cases in a period, prevalence is total existing cases at a point. I had been using those interchangeably my whole life.

The epidemic curve shape is the part I found genuinely elegant. A sharp single peak suggests one common source. A series of rising waves suggests person-to-person spread. The shape of the graph tells you the transmission mechanism before you know anything else.

**Kept in the notebook** for the outbreak lab.

### WED NOV 18 **Outbreak data and agent ID lab** LAB

The best lab of the semester. We took raw case data and built the line list, plotted an epidemic curve, made a spot map, and ran identification tests to narrow the agent.

Watching a pile of case records become a curve with a shape, and then a map with a visible cluster, and having those two independently point at the same thing, was the closest this class has come to feeling like actual work rather than school. Our cluster was tight around one location and our curve had a single sharp peak, and those two facts together said common source before any test came back.

**Turned in:** data table, epidemic curve, spot map → Data Tables folder.

### THU NOV 19 **Source and agent CER**

A CER naming the likely source and agent, citing three independent sources of evidence: curve shape, geographic cluster, and the identification test.

Three independent lines converging is what earns the claim. This is the same convergent-evidence idea from the week six ethics debate, showing up nine weeks later as a working method. I do not think that ordering is an accident.

**Turned in:** CER → Claim Evidence Reasoning folder.

## AT HOME, THE NIGHT BEFORE FRI NOV 20 **Submit tracker and evidence**

Curve, map, test results, and CER into one file, checked against the rubric, sources cited, limitations noted.

My confidence rating went up this week and it is the first time it has been honest rather than optimistic.

**Turned in:** full outbreak package → recorded in Class Records.

### THAT WEEK AT HOME

About forty five minutes. Incidence versus prevalence went on cards immediately because I know I will mix them up again. I also redrew the epidemic curve shapes from memory, labeled by transmission type, since that is a likely test question and it is visual enough to stick.

Weekend was a full pass over Unit 3 so far, plus the Unit 1 chain-of-custody material, which is old enough now that it needs deliberate revisiting.

### WEEKEND · THE RESEARCH EXTRA CREDIT

I did the research experience extra credit on Saturday. It is optional and it is the best thing I have done all semester. A university lab hosted a handful of us for a morning and a graduate researcher walked us through what she actually does.

Two things surprised me. First, most of her week is troubleshooting equipment and rerunning things that did not work, which is exactly what happened to us in the biomolecule lab, so apparently that never stops. Second, she said she did not decide on research until her third year of college, which I needed to hear, because I have been treating this like every decision is permanent.

She let me pipette. I was bad at it. I want to do it again.

Unit: emergency response. Two days, then Thanksgiving.

## FRI NOV 20 **Triage ethics debate** **ETHICS DAY**

How should scarce emergency resources be allocated in a mass-casualty situation? Triage by likelihood of survival, or first come first served?

This was the quietest debate we have had. Not because nobody had opinions, but because everyone understood immediately that both answers are bad. Sorting by survival likelihood means deliberately passing over someone who is dying. First come first served means someone who could have been saved dies because they arrived second.

The line I wrote down: triage is ethical calculus under pressure, and the criteria you choose are a value system, not just a medical protocol. It is one thing to have that argument on a Monday in November. It is another to have it while people are actually in front of you, which is the part I keep thinking about.

**Turned in:** exit ticket → Exit Tickets folder.

## AT HOME, THE NIGHT BEFORE TUE NOV 24 **Assessment and drug delivery notes**

The ABCDE assessment sequence and the order of stabilization, then drug delivery routes and how each one changes onset time. Intravenous is fastest, oral is slowest, and the route is chosen for the situation rather than for convenience.

Emergency response is a sequence: assess, categorize, stabilize, treat. Doing them out of order is how people get missed.

**Kept in the notebook** for the simulation after the break.

**Thanksgiving.** Out Wednesday through Friday. The emergency simulation was supposed to be Wednesday, so it moved to the Monday we came back. Mr. Mendoza told us not to do PBS work over the break, which was the first time all semester he told us to stop.

### **THAT WEEK AT HOME**

Two nights of about twenty minutes, then nothing. I did read my ABCDE notes once on Sunday because the simulation was Monday and I did not want to be the person slowing the team down.

## Week 14 • November 24 to December 4

Emergency simulation, then straight into surge and design. The compression starts.

### TUE NOV 24 **Emergency-response simulation** TEAM SIMULATION

Multiple simulated patients, a clock, and team roles: assessment, bleeding control, documentation. I was on documentation again, and this time I understood why that matters before being told.

We were not good at it. We tagged our first patient correctly, then a second patient's situation changed and two of us went to help while nobody was assessing the third. Our timing notes show a ninety second gap where the third patient had nobody. In a real event that is the whole thing.

The debrief was the best part. The failure was not medical knowledge, we knew the protocol. It was that we abandoned our roles the moment things got stressful. Improvising under pressure feels like responsiveness and it produced a missed assessment. That is exactly what the SOP exists to prevent and we found out by breaking it.

**Turned in:** team decision log with triage tags and timing → Lab Reports folder.

### MON NOV 30 **Response analysis CER**

A CER evaluating our own triage order against the patient outcomes, using our decision log as evidence, and recommending a protocol change.

Writing an honest evaluation of a performance I was not proud of is the hardest assignment of the semester, and not because it was technically difficult. My recommendation was that the documentation role should be the one person who never leaves their post, because they are the only one tracking all patients at once. That came directly from watching our own gap happen.

He said evaluating your own decisions against evidence is the highest-order skill in emergency medicine, because it is what drives the next protocol improvement. I believe him now.

**Turned in:** CER → Claim Evidence Reasoning folder.

### TUE DEC 1 **Surge resource debate** ETHICS DAY

How should a community prioritize mobile medical resources during a surge? Deploy to dense areas where you reach the most people, or to underserved areas where the need per person is highest?

This is the equity version of the triage question, scaled from one room to a whole region. Same structure, and I noticed the structure this time, which I would not have in September.

**Turned in:** exit ticket → Exit Tickets folder.

## WED DEC 2 **Surge and usability notes**

Medical surge planning, mobile facility design, then usability principles for public-facing health apps. The connection is that public health communication fails when the message is accurate but the delivery is unusable. Correct information in a bad interface does not reach anyone.

That felt like a different subject for about ten minutes and then it did not. A public-health message nobody can act on has the same practical result as no message.

**Kept in the notebook** for the design project.

## FRI DEC 4 **Public-health design project** **TEAM**

Teams designing a usable public-health communication app for a surge scenario. Two user personas, a prioritized feature list, and a low-fidelity wireframe of two screens.

Our first personas were basically us, which our teammate correctly called out as useless. We rewrote them as an older person without reliable internet and a parent with three kids and no time, and the entire feature list changed. Half of what we had prioritized served nobody but ourselves.

A wireframe that ignores who the user is is design fiction rather than design. That sentence is going to stay with me.

**Turned in:** personas, feature list, wireframe → recorded in Class Records.

### **THAT WEEK AT HOME**

Close to an hour most nights. The simulation CER took two sittings because I kept softening what went wrong and then deleting the softening.

Weekend I started the real WebXam push. Twelve weeks of Cornell questions in one stack, working through them in order and marking the ones I could not answer. About a quarter came back unanswered, and that quarter is now my study list for the rest of the semester.

## Week 13 • November 20 to December 11

Unit: innovation. Building something instead of analyzing something.

### FRI NOV 20 **Submit innovation package**

Model specs, trial data, CER, tracker updated with a confidence rating on engineering design.

**Turned in:** full innovation package → recorded in Class Records.

### MON DEC 7 **Design justification CER and device ethics** **ETHICS MONDAY**

Two things today because of the compression. First the CER justifying our app design against the personas and usability principles, proving each choice serves a real need rather than a preference.

Then the device ethics debate: how much testing should a new biomedical device require before it reaches patients? Speed and safety in direct tension. More testing protects people and delays access for people who are suffering right now. Somebody pointed out that the people harmed by delay are invisible in a way the people harmed by a bad device are not, and that asymmetry is why the debate never resolves cleanly.

**Turned in:** CER → Claim Evidence Reasoning folder, plus the exit ticket.

### AT HOME, THE NIGHT BEFORE THU DEC 10 **Engineering design notes**

The seven stages of the engineering design process, and how CAD turns a concept into something you can test. The framing that mattered: design is a loop, not a line. Every test produces data that feeds the next version, so a failed prototype is an input rather than an ending.

**Kept in the notebook** for the testing lab.

### THU DEC 10 **Device and model testing lab** **LAB**

We built a model and tested it, identifying independent, dependent, and controlled variables, and running at least three trials.

Three trials is the rule and I finally understand why. One trial is a measurement. Three trials let you see spread, and the spread tells you whether your result is real or noise. That is the same idea as the standard deviation lesson in week two, arriving again fourteen weeks later in a context where I needed it.

Our first build failed on trial one. We had not controlled a variable we did not realize was a variable. Rebuilding cost us twenty minutes and the second version held.

**Turned in:** data table with three trials → Data Tables folder.

## FRI DEC 11 **Prototype evaluation CER**

A CER on whether the prototype met its design goal, citing averaged trial data, explaining strengths and flaws, and proposing the next iteration.

He was explicit that a CER reporting only success is incomplete. Our prototype partly met its goal and failed on one measure, and writing both, with a specific proposed change, is the assignment. The honest version is more useful than the flattering one, which by now is the most repeated idea in this class.

**Turned in:** CER → Claim Evidence Reasoning folder.

### **THAT WEEK AT HOME**

About forty five minutes a night on class work, plus thirty on the WebXam list. I am running two tracks now: finish the current unit, and work the unanswered pile from the weekend audit.

Weekend was almost entirely WebXam. The unanswered pile is down from a quarter to about a tenth.

### **AFTER SCHOOL · THE COMPUTER LAB**

I have been in the computer lab most days this week finishing myPLTW activities. The platform work runs alongside everything else all semester and it is easy to let it slide, because it is not what we do in class and nobody reminds you daily.

Mine was about eighty percent done and I had let the last stretch pile up. Two afternoons in the lab with headphones on cleared it. The lesson, which he has said all semester and I am learning the expensive way, is that steady beats heroic.

## Week 17 • December 14 to 18

The last three days. Capstone synthesis, and the semester closes.

### MON DEC 14 **Frontier medicine ethics debate** ETHICS MONDAY

The final Monday. Should biomedical research money go to extreme frontiers like space and undersea medicine, or to everyday care that helps more people now?

I argued for everyday care and lost ground on a point I had not considered: frontier research produces unexpected breakthroughs that come back to ordinary patients, and you cannot know in advance which ones. The counterargument to my counterargument is that "it might pay off somehow" justifies any spending at all. We ended without resolving it, which at this point is what I expect and no longer find frustrating.

John Carroll closed by asking us to name one position we had changed across the semester. Mine was genetic privacy. I came in certain and left genuinely unsure, and I think that is an improvement.

**Turned in:** exit ticket → Exit Tickets folder.

### THU DEC 17 **Final innovation team project** TEAM CAPSTONE

The capstone. Teams synthesizing evidence from earlier units into a single innovation concept, with a GIS story-map showing where the health problem concentrates geographically.

We had to pull evidence from at least two prior units, and picking which ones forced us to reread our own work from September. Our outbreak spot map from week thirteen turned out to be directly useful, which none of us expected. The map showed the same thing the story-map needed to show: where a problem clusters tells you where to intervene.

Dividing the work was smoother than it would have been in September. We wrote out who owned what before starting, because we have all been burned by not doing that.

**Turned in:** team innovation brief and story-map draft → recorded in Class Records.

### FRI DEC 18 **Innovation pitch CER and final submission**

Last day. A synthesis CER naming the health problem and our innovation, citing evidence from two prior units and the story-map, and reasoning through how the innovation connects to disease prevention. Then everything gets compiled and submitted.

He told us a pitch CER is not a sales pitch. It is an argument that the thing is worth pursuing, and it has to survive someone who does not want to be convinced. That is the same standard as the very first CER in August, applied to something twenty times larger.

Then we retook the WebXam practice test we took cold on August 28. I will not pretend the number was spectacular, but it was not close to the same test I sat in week one. He showed us both scores side by side and said the gap is the semester.

**Turned in:** capstone package and final tracker → recorded in Class Records.

### THAT WEEK AT HOME

Heavy, then done. Two long nights on the capstone, then the last night was just review.

The WebXam is in the spring, not now, so the December practice was a checkpoint rather than the finish. My plan over break is fifteen minutes a few times a week on the remaining unanswered pile, which is small enough now that it is not intimidating.

The thing I did not expect is how much of this class is writing. I thought biomedical science would be labs and equipment, and there were plenty of both, but the lab is maybe a third of it. The rest is building an argument that survives someone attacking it. Every unit ends the same way: claim, evidence, reasoning, and an honest statement of what you cannot prove.

The second thing is that the Mondays turned out to be the reason the rest works. I thought ethics day was a break from the real content. It is actually where I learned to hold a position, get it taken apart, and change my mind without feeling like I lost. That is the same skill as writing a limitations section, and it is the same skill as sitting in a debrief after your team missed a patient.

The third thing is teamwork, which I was worst at. Our scene photos in September, our evidence board argument, our triage gap, the personas that were secretly just us. Every one of those failures was a communication failure rather than a knowledge failure. We knew the material each time. We did not talk to each other before starting.

The fourth thing is that the class is not only the class. HOSA, chess, the Clinic onboarding, and the research morning were not extras I did on the side. The Clinic badge is the reason the vital signs week mattered to me. The research morning is the reason I now know that failing an experiment is the job rather than a sign I am not cut out for it. Chess is where I found out that my worst habit is moving before I look at what everyone else is doing, which is the same habit that cost my team a period in September.

What I need from you is mostly what you are already doing. Ask me what the Monday question was, and push back on my answer, because I get better at those when someone makes me defend them out loud. That fifteen minutes a night is not negotiable and it is the reason December did not feel like a wall. And if I say I have no homework, ask me what is in the unanswered pile.

One more thing, and then I will stop. I still want to be a doctor. I wanted it in August for a reason that was mostly a feeling, which was that hospital room and not understanding anything anyone said. I still want it in December for a reason I can now say out loud: I have seen a small piece of what the work actually is. It is careful documentation, arguing with people who disagree with you, admitting the limits of what your evidence proves, and doing it again when the first attempt fails. None of that is glamorous and all of it is something I can practise starting now.

That is the difference between wanting to be a doctor and starting to become one, and this semester is where it started.

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*Principles of Biomedical Science, Fall 2026. Seventeen weeks, four units, a lot of CERs. Go Hornets.*