

Late Work and Corrections

Due Friday, October 9, 2026

Complete missing work or correct mistakes in work you already submitted. Scan each assignment and upload it to its original Schoology assignment by Friday, October 9, 2026. Work already submitted correctly does not need to be resubmitted.

Where to submit

For late work and corrections, these Schoology instructions override older directions to hand in paper or upload work to a tracker.

Complete paper worksheets and notebook activities as directed. Scan the required work for submission and keep the original pages.

Using the original packet

The original packet follows unchanged. Its lesson dates and original assignment and exam deadlines are unchanged; October 9 is the deadline for this late-work and corrections process.

JOHN HAY HIGH SCHOOL · PLTW BIOMEDICAL SCIENCE · MR. MENDOZA · ROOM 381 · PERIOD 1-2

Principles of Biomedical Science

Complete Assignment Packet

Period 1-2 · Case A (STATIC) · Every assignment from Monday, August 24 to Friday, October 2, 2026, in order by date, then title. Each assignment's official briefing and evidence sheet are bound in right after its directions.

From Mr. Mendoza. This packet holds every assignment we have done this year, up to the Unit 1 take-home exam. Each assignment starts with my directions: what we need to accomplish, our goal, what you turn in, and color-coded steps. Right behind the directions you will find that day's own briefing pack and Daily Evidence Sheet, so the reading and the questions are never more than a page away.

Our case. Case A, STATIC: Marcus Bell, 34, owner of Statik Sound, a neighborhood recording studio, was found on the studio floor behind the mixing console on a Monday morning by his business partner. By Day 18 your team names the manner and cause of death and backs each one with at least four exhibits across three different kinds of evidence. Every claim stops where the evidence stops.

The step colors

1

READ

READ. Take in the information right under the step, or in the pages right after the directions.

1

DO

DO. An action: set up, draw, calculate, sort, or examine.

1

WRITE

WRITE. Write the part you will turn in, in your own words.

1

CHECK

CHECK. Compare your work to the rule given and fix it.

1

TURN IN

TURN IN. Make one PDF and submit it to the Schoology assignment named in the step.

Before you start: how a demanding course stays clear

The bottom line. This course is rigorous on purpose, because medicine is. A rigorous course stays clear only one way: a little real work every day. Confusion is not a sign that you cannot do this. It is a predictable signal that some steps were skipped. That is good news, because skipped steps can be filled in, and this packet is how.

What being overwhelmed actually is

Your working memory, the part of your mind that holds new information while you use it, can only juggle a few new pieces at once. New material makes sense when earlier material is already stored in long-term memory, so the new piece has something to attach to (Sweller, van Merriënboer and Paas, 2019). Every lesson in this course builds on the one before it: case records lead to DNA reads, DNA reads lead to BLAST, antibodies lead to the ELISA, the ELISA leads to test accuracy. Skip one day and the next lesson arrives with nothing to attach to. The new pieces pile up in working memory at once. That pile-up is what "overwhelmed" feels like.

Three habits cause almost all of it:

What happens	Why it overwhelms you	The fix
Work left undone in class	Time not used in class does not disappear. It moves to home, where there is less help and more distraction. "I did not have time at home" usually starts with class time that went unused.	Work bell to bell. Class is the cheapest learning time you have: the teacher, the materials and your partners are all in the room.
Notes taken but never processed	Notes you only copy stay on paper, not in memory. The next lesson has nothing to connect to.	Use the 6 Rs the same day, even for 20 minutes.
Multitasking	Your brain does not do two thinking tasks at once. It switches, and every switch costs time and accuracy.	One task, full attention, phone away. Then the next task.

What the research says works

Spread it out. Studying a little across several days builds stronger, longer-lasting memory than the same amount of time crammed into one session (Cepeda and colleagues, 2006; Carpenter, Pan and Butler, 2022).

Test yourself. Pulling information out of your memory, without looking, makes it stick far better than rereading it (Roediger and Karpicke, 2006). A major review of ten common study methods rated practice testing and spaced practice as the two most effective; highlighting and rereading were rated low (Dunlosky and colleagues, 2013).

The 6 Rs put both into one routine. Record (take the notes), Reduce (turn them into short cue questions), Review (study from the cues on different days, which is spacing), Reflect (write what still confuses you), Recite (explain it out loud without looking, which is self-testing), Revise (fix your notes after practice).

Multitasking makes everything worse. Switching between tasks has a measurable cost in time and errors (Rubinstein, Meyer and Evans, 2001). College students who divided their attention with devices during class scored lower on exams (Glass and Kang, 2019), and laptop multitasking lowered learning both for the person doing it and for classmates who could see the screen (Sana, Weston and Cepeda, 2013). People who multitask with media more often have more lapses of attention, and those lapses predict forgetting (Uncapher and Wagner, 2018; Madore and colleagues, 2020). If you try to do two things at once, you do both of them worse.

Use this as a learning opportunity

The habits that clear this packet are the same habits clinicians use every day: one patient at a time, record before you interpret, check before you act. Here is the routine that keeps this course clear:

When	What to do	Time
In class	Phone away. Work bell to bell. Finish the day's turn-in before you leave whenever you can.	80 minutes
Same day, at home	Reduce and Recite: write three cue questions from the day's notes, then answer them out loud without looking.	20 minutes
Next day, before class	Review yesterday's cue questions. Mark anything you missed.	5 minutes
Once a week	Reflect and Revise: write what still confuses you and fix those notes. Bring the question to class.	20 minutes

Signs you are starting to overload, and what to do

If you notice this	It usually means	Do this
A new lesson feels like a foreign language	An earlier step is missing	Go back one assignment and finish it first
You read the same paragraph three times	Working memory is full or attention is split	Phone in another room; do one step at a time
You have a long list of missing work	A backlog has built up	Do one assignment, submit it, check it off. Then the next.
You understand in class but forget by the next day	Notes were not processed	Same-day 6 Rs: Reduce and Recite

Sources

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- Sweller, J., van Merriënboer, J. J. G., and Paas, F. (2019). Cognitive architecture and instructional design: 20 years later. *Educational Psychology Review*, 31, 261 to 292. <https://doi.org/10.1007/s10648-019-09465-5>
- Uncapher, M. R., and Wagner, A. D. (2018). Minds and brains of media multitaskers: Current findings and future directions. *Proceedings of the National Academy of Sciences*, 115(40), 9889 to 9896. <https://doi.org/10.1073/pnas.1611612115>

Your 28 assignments, in order

Check off each one when it shows as submitted in Schoology. Already turned in? Check it and skip it. Then start with the first unchecked row. The Unit 1 take-home exam is a separate printed packet and is not in this packet.

Done	#	Date	Assignment	Schoology assignment name
☐	1	Mon, Aug 24	Welcome, expectations, and how this class works	Wk1 Exit ticket: Welcome, expectations, and how this class works
☐	2	Tue, Aug 25	How to use the class website	Wk1 Exit ticket: How to use the class website
☐	3	Wed, Aug 26	Cornell notes and the 6 Rs	Wk1 Lab notebook: Cornell notes and the 6 Rs
☐	4	Wed, Aug 26	Cornell notes and the 6 Rs: the lab record	Wk1 Lab: Cornell notes 6 Rs
☐	5	Thu, Aug 27	Lab safety, myPLTW, and how to submit: PLTW course orientation	Wk1 PLTW: Lab safety, myPLTW, and how to submit
☐	6	Thu, Aug 27	Lab safety, myPLTW, and how to submit: safety check	Wk1 Pre-lab: Lab safety, myPLTW, and how to submit
☐	7	Fri, Aug 28	The Missing Microscope: Crime Scene CER Scenario	The Missing Microscope: Crime Scene CER Scenario
☐	8	Fri, Aug 28	WebXam pretest and goal setting	Wk1 WebXam practice: WebXam pretest goal
☐	9	Mon, Aug 31	WebXam Pretest Debrief and Study Plan (Take-Home Exam, 100 points)	WebXam Pretest Debrief and Study Plan (Take-Home Exam, 100 points)
☐	10	Tue, Sep 1	Investigation Day 1: The Rules of Evidence	Wk2 D01 · The Rules of Evidence (PLTW 1.1.1)
☐	11	Wed, Sep 2	Investigation Day 3: Qualify for the Scene	Wk3 D03 · Qualify for the Scene
☐	12	Fri, Sep 4	Investigation Day 2: Numbers That Do Not Lie to You	Wk2 D02 · Numbers That Do Not Lie to You (PLTW 1.1.1)
☐	13	Wed, Sep 9	Investigation Day 4: The Case Opens	Wk3 D04 · The Case Opens (PLTW 1.1.1)
☐	14	Thu, Sep 10	Investigation Day 5: Walk the Scene	Wk3 D05 · Walk the Scene (PLTW 1.1.1)
☐	15	Fri, Sep 11	Investigation Day 6: Process the Scene	Wk3 D06 · Process the Scene
☐	16	Mon, Sep 14	Investigation Day 7: The Traces We Leave	Wk4 D07 · The Traces We Leave (PLTW 1.1.3)
☐	17	Wed, Sep 16	Investigation Day 8: Maybe Is a Result	Wk4 D08 · Maybe Is a Result
☐	18	Fri, Sep 18	Investigation Day 9: Whose Blood, Whose DNA	Wk4 D09 · Whose Blood, Whose DNA
☐	19	Mon, Sep 21	Investigation Day 10: Barcodes and Panels	Wk4 D10 · Barcodes and Panels
☐	20	Wed, Sep 23	Investigation Day 11: Who Speaks for the Dead	Wk5 D11 · Who Speaks for the Dead
☐	21	Thu, Sep 24	Investigation Day 12: The Clock in the Body	Wk5 D12 · The Clock in the Body

Done	#	Date	Assignment	Schoology assignment name
[]	22	Thu, Sep 24	John Carroll bioethics debate 1: should ELISA testing be mandatory?	Wk5 CER: JCU bioethics 1, should ELISA testing be mandatory?
[]	23	Fri, Sep 25	Investigation Day 13: Autopsy Day	Wk5 D13 · Autopsy Day
[]	24	Mon, Sep 28	Investigation Day 14: The Fabric Under the Lens	Wk5 D14 · The Fabric Under the Lens
[]	25	Wed, Sep 30	Investigation Day 15: Where Claims Must Stop	Wk6 D15 · Where Claims Must Stop
[]	26	Thu, Oct 1	Investigation Day 16: The Tree Resolves	Wk6 D16 · The Tree Resolves
[]	27	Thu, Oct 1	John Carroll bioethics debate 2: should we ban antibiotic use in livestock?	Wk6 CER: JCU bioethics 2, should we prohibit antibiotic use in livestock?
[]	28	Fri, Oct 2	Investigation Day 17: Build the Board	Wk6 D17 · Build the Board

ASSIGNMENT 1 OF 28 Mon, Aug 24 about 15 minutes**Welcome, expectations, and how this class works**

Today we need to accomplish learning how this class runs every day and setting one goal for the semester.

Our goal is routines so automatic that our energy goes into the science.

You have to turn in an exit ticket: your semester goal, one expectation in your own words, and one question.

Schoology assignment: Wk1 Exit ticket: Welcome, expectations, and how this class works

1

READ

First, we learn what this course is. Principles of Biomedical Science introduces the human body, disease, and how medical and forensic scientists use evidence. This year we start with a case we investigate together. Our five expectations are below.

Expectation	What it looks like
Be on time	In your seat when the bell rings
Be prepared	Notebook, pen, charged device
Phone away	Out of sight unless I say we are using it
Be respectful	Listen when others speak
Be on task	Working bell to bell

2

WRITE

Write your semester goal in one specific sentence.

HINT Specific means you could check it later: "Turn in every evidence sheet the day it is due."

3

WRITE

Pick one expectation from the table in step 1, explain it in your own words, and say why it matters in a lab.

4

WRITE

Write one real question you have about this class.

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 Exit ticket: Welcome, expectations, and how this class works**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 2 OF 28 Tue, Aug 25 about 15 minutes

How to use the class website

Today we need to accomplish learning to find the daily plan on our class website and its Schoology assignment.

Our goal is that you can always find what we are doing, even on a day you miss.

You have to turn in a scavenger hunt sheet: one day's objective, one resource you opened, and where that day's work is submitted.

Schoology assignment: Wk1 Exit ticket: How to use the class website

1

READ

This one assignment is about the website itself, so it is the only time this packet sends you there. Every day page has Part 1 background, Part 2 directions, Part 3 a worked example, and Part 4 your work.

2

DO

Go to mendozabiomed.org/learn, choose Principles of Biomedical Technology, and open any day page. No computer? Skip to step 4.

3

WRITE

Copy that day's objective. Open one resource and write its name. Write the name of the Schoology assignment in Part 4.

4

WRITE

No computer? Write "no computer access" and answer from this packet: objective = "learning to find the daily plan on our class website," resource = "this packet," assignment = "Wk1 Exit ticket: How to use the class website."

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 Exit ticket: How to use the class website**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 3 OF 28 Wed, Aug 26 about 25 minutes**Cornell notes and the 6 Rs**

Today we need to accomplish setting up a Cornell notes page and taking your first notes.

Our goal is notes you actually learn from.

You have to turn in a photo or PDF of your first Cornell page: cue questions, notes, and a summary.

Schoology assignment: Wk1 Lab notebook: Cornell notes and the 6 Rs

1

DO

Set up the page: a line down the page about 2.5 inches from the left, and a strip about 2 inches tall at the bottom. Right = notes, left = cue questions, bottom = summary.

2

READ

Read this short reading once all the way through.

Reading: what forensic scientists do. Forensic science applies scientific methods to questions that matter to the law. A forensic scientist records what is observed before deciding what it means. An **observation** is something you see or measure. An **inference** is what you conclude from it. An **opinion** is a belief that evidence cannot settle. Every piece of evidence is documented, labeled, and tracked, so another scientist can check the work.

3

WRITE

Take notes on the reading in the right column, in short phrases.

Reading: what forensic scientists do. Forensic science applies scientific methods to questions that matter to the law. A forensic scientist records what is observed before deciding what it means. An **observation** is something you see or measure. An **inference** is what you conclude from it. An **opinion** is a belief that evidence cannot settle. Every piece of evidence is documented, labeled, and tracked, so another scientist can check the work.

HINT Key ideas: observation, inference, opinion, documented, another scientist can check.

4

WRITE

In the left column, write two or three questions your notes answer. At the bottom, write a two-sentence summary: *Why must a forensic scientist record an observation before explaining it?*

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 Lab notebook: Cornell notes and the 6 Rs**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 4 OF 28 Wed, Aug 26 about 20 minutes**Cornell notes and the 6 Rs: the lab record**

Today we need to accomplish running all six of the 6 Rs on your Cornell page.

Our goal is feeling the difference between copying notes and learning them.

You have to turn in one page showing each of the 6 Rs done.

Schoology assignment: Wk1 Lab: Cornell notes 6 Rs

1

READ

Here are the 6 Rs.

R	What you do
Record	Take notes (done on your Cornell page)
Reduce	Turn notes into 2 or 3 questions (done)
Review	Cover the notes; answer the questions from memory
Reflect	Write what still confuses you
Recite	Explain it aloud without looking
Revise	Fix or add to your notes

2

DO

On a new page write "Record: done" and "Reduce: done." Then Review: cover your notes, answer each cue question from memory, and write how many you got right.

R	What you do
Record	Take notes (done on your Cornell page)
Reduce	Turn notes into 2 or 3 questions (done)
Review	Cover the notes; answer the questions from memory
Reflect	Write what still confuses you
Recite	Explain it aloud without looking
Revise	Fix or add to your notes

3

WRITE

Reflect: write one thing that still confuses you. Recite: explain the reading aloud for one minute without looking, then write one thing you left out.

4

WRITE

Revise: add what you left out to your notes in a different color.

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 Lab: Cornell notes 6 Rs**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 5 OF 28 Thu, Aug 27 about 10 minutes**Lab safety, myPLTW, and how to submit: PLTW course orientation**

Today we need to accomplish completing our course orientation checklist.

Our goal is everything you need for the year set up before labs.

You have to turn in the orientation checklist, filled in.

Schoology assignment: Wk1 PLTW: Lab safety, myPLTW, and how to submit

1

READ

Copy this checklist onto a page.

Orientation item	Done? (yes or no)
I know our routine and five expectations	
I can find a day page on the class website	
My notebook has a Cornell page	
I signed the safety contract and handed it in	
I took the baseline WebXam pretest	
myPLTW: opens, or access unavailable	

2

DO

Try to open myPLTW through Clever with your school sign-in. Write "opens" or "access unavailable" in the last row.

HINT Either answer is fine. I only need to know.

3

WRITE

Fill in yes or no for every other row. For any "no," write what you need.

4

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 PLTW: Lab safety, myPLTW, and how to submit**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 6 OF 28 Thu, Aug 27 about 20 minutes**Lab safety, myPLTW, and how to submit: safety check**

Today we need to accomplish passing a safety check and signing the safety contract.

Our goal is that nobody gets hurt and no work is lost.

You have to turn in the signed contract (to me), your scavenger hunt answers, and an access note.

Schoology assignment: Wk1 Pre-lab: Lab safety, myPLTW, and how to submit

1

READ

Three safety words.

Word	Meaning
PPE	Personal protective equipment: goggles, gloves, apron.
SDS	Safety data sheet: a chemical's hazards and first aid.
SOP	Standard operating procedure: the exact steps we follow every time.

2

DO

Scavenger hunt in Room 381: write where the eyewash, fire blanket, SDS binder, and goggles and gloves are.

3

DO

Read and sign the safety contract and hand it to me. The parent copy goes home.

4

WRITE

Write whether myPLTW "opens" or is "access unavailable."

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 Pre-lab: Lab safety, myPLTW, and how to submit**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 7 OF 28 Fri, Aug 28 about 30 minutes**The Missing Microscope: Crime Scene CER Scenario**

Today we need to accomplish deciding what the evidence in a small, made-up case supports.

Our goal is a claim that goes exactly as far as the evidence, and no further.

You have to turn in one CER: claim, evidence, reasoning, and a limit.

Schoology assignment: The Missing Microscope: Crime Scene CER Scenario

1

READ

The case sheet is the very next page after these directions. Read the whole scene and the reference record once before writing.

2

WRITE

Claim: which explanation is best supported: Person A, B, or C removed the microscope, or the evidence is not enough to name one person?

HINT "The evidence is not enough" is a real answer when the evidence does not point to one person.

3

WRITE

Evidence: at least two facts from the sheet. **Reasoning:** explain why those facts support your claim. **Limit:** one sentence on what the evidence cannot show.

4

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **The Missing Microscope: Crime Scene CER Scenario**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

The Missing Microscope

A fictional, nonviolent crime scene challenge. Your job is to decide what the evidence supports, not to accuse a real person.

Scene	Your role
At 4:55 p.m., a digital microscope was reported missing from the locked biomedical prep room. The door and cabinet showed no damage. Three event volunteers were nearby during cleanup. All people, times, and evidence in this case are simulated.	You are on the evidence review team. Decide which explanation is best supported: Person A removed it, Person B removed it, Person C removed it, or the evidence is insufficient to identify one person.

REFERENCE RECORD

Person	Clothing during cleanup	Shoe record	Statement
A	Navy wool jacket	28.0 cm, herringbone outsole	Entered to return goggles, then left empty-handed.
B	Royal-blue polyester hoodie	27.0 cm, diamond outsole	Walked past the prep room while carrying a sports bag.
C	Gray polyester jacket	29.0 cm, herringbone outsole	Moved a projector case from the prep room to a media cart.

EVIDENCE CARDS

E1 DOOR LOG	Observation: At 4:42 p.m., the door opened using the code assigned to Person A. Limit: The code was shared with the cleanup team during setup.
E2 SHOE PRINT	Observation: A dusty partial print beside the empty cabinet is about 28.0 +/- 0.5 cm long with a herringbone pattern. Limit: Size and tread are class characteristics. Many shoes can share them.
E3 FIBERS	Observation: Two royal-blue polyester fibers were recovered from the cabinet latch. They match Person B's hoodie in color and fiber type. Limit: A fiber can transfer directly or through another object.
E4 HALL CAMERA	Observation: At 4:47 p.m., a person in a dark top carried a black rectangular case away from the hallway. Limit: The face and height are not visible. Camera color is unreliable.
E5 WORK ORDER	Observation: A signed work order tells Person C to move a black projector case from the prep room at 4:50 p.m. Limit: The order explains a case movement, but does not show what was inside.
E6 CABINET CHECK	Observation: The microscope's black hard case is missing from its shelf. The latch print is smudged and cannot be compared reliably. Limit: The missing case fits the camera observation, but does not identify the carrier.

CER response prompt: Which explanation is best supported by the evidence: Person A removed the microscope, Person B removed it, Person C removed it, or there is not enough evidence to identify one person? Write one claim. Support it with at least three evidence items by ID, then explain how the evidence supports your claim. Address one limitation or conflicting clue. Use *most supported*, not *proved guilty*.

ASSIGNMENT 8 OF 28 Fri, Aug 28 about 15 minutes**WebXam pretest and goal setting**

Today we need to accomplish taking an ungraded starting test and setting one goal.

Our goal is knowing where you start, so we can measure growth.

You have to turn in a written mastery goal and two routines you will keep.

Schoology assignment: Wk1 WebXam practice: WebXam pretest goal

1

READ

The WebXam is Ohio's end-of-course test for this course, test 072110. The pass line is 65 percent. The pretest is a starting point, not a grade.

2

DO

Not tested yet? Tell me and I will set up a time. For now, use the practice values below and write "SIMULATED."

Domain (WebXam 072110)	Practice score (use only if you have no report)
1. Handling, Preparation, Storage and Disposal	44%
2. Biotechnology Research and Experiments	58%
Total	51%

3

WRITE

Write one mastery goal, for example "Raise my Total from 51 to 65 by November."

Domain (WebXam 072110)	Practice score (use only if you have no report)
1. Handling, Preparation, Storage and Disposal	44%
2. Biotechnology Research and Experiments	58%
Total	51%

4

WRITE

Write two routines from the first weeks you will keep, and one question you still have.

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk1 WebXam practice: WebXam pretest goal**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 9 OF 28 Mon, Aug 31 about 90 minutes**WebXam Pretest Debrief and Study Plan (Take-Home Exam, 100 points)**

Today we need to accomplish turning your pretest results into a real study plan.

Our goal is a plan where scores point to priorities, priorities to weekly actions, and actions to proof.

Graded on the plan, never on your score.

You have to turn in one document with Parts 1 to 5, named FirstName LastName - WebXam Pretest Debrief and Study Plan - 2026-09-03.

Schoology assignment: WebXam Pretest Debrief and Study Plan (Take-Home Exam, 100 points)

1

READ

Your two reference sheets start on the very next page: the take-home directions and rubric (3 pages), then the simulated report (2 pages). Read the directions first.

2

WRITE

Part 1, baseline. Table with Domain 1, Domain 2, and Total: your score (or the practice values below, marked SIMULATED) and points to 65 (65 minus your score).

Domain (WebXam 072110)	Practice score (use only if you have no report)
1. Handling, Preparation, Storage and Disposal	44%
2. Biotechnology Research and Experiments	58%
Total	51%

3

WRITE

Part 2, three priority concepts with one sentence of evidence each. Good choices: lab safety, chain of custody, storing and preparing samples, reading a data table against a reference range, choosing the right graph.

4

WRITE

Part 3, weekly routine: concept, resource, 6 Rs action, day and time, minutes (at least 20), for 12 weeks. One sentence per concept on why the action fits.

5

DO

Part 4, graphs: a bar graph of your scores with a line at 65 (axis from 0), and a straight growth line from your Total at week 0 (Sep 4) to a target of at least 65 at week 12 (Nov 27). Rate = (target minus baseline) divided by 12.

Domain (WebXam 072110)	Practice score (use only if you have no report)
1. Handling, Preparation, Storage and Disposal	44%
2. Biotechnology Research and Experiments	58%
Total	51%

HINT Example: (65 minus 51) divided by 12 = about 1.17 points per week.

6

WRITE

Part 5, checkpoints: predicted score and one proof of learning for Oct 2 and Oct 30, what you will change if Oct 2 comes in low, and one paragraph explaining how the parts connect.

7

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **WebXam Pretest Debrief and Study Plan (Take-Home Exam, 100 points)**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

WEBXAM 072110 · PRINCIPLES AND PRACTICE OF BIOMEDICAL TECHNOLOGY

Principles of Biomedical Science · take-home exam

FORM NO. WX-PBS-PRE-01
CASE NO. 2026-09-03
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

WEBXAM PRETEST DEBRIEF AND STUDY PLAN

Take-home exam · 100 points · Assessment category

OFFICIAL

ASSESSMENT · 100 POINTS

GRADED ON COHERENCE, NOT ON YOUR SCORE

DUE TUESDAY, SEPTEMBER 8, 11:29 PM IN SCHOOLGY

DIRECTIONS, IN PLAIN ENGLISH

SEC 00

Earn 100 points with a **coherent study plan**, a plan whose parts fit together. Your pretest score cannot lower this grade. Use available evidence to choose three concepts, practice each one, and check your progress.

Start with your private WebXam report in Schoology. If you have not tested, use the **SIMULATED report** linked on the portal lesson. Label its numbers "simulated." Revise your plan in class after your make-up test. If you cannot find your report, tell me; do not use someone else's.

What you turn in. One PDF, built from the Google Doc template linked on the portal day page, with these five parts in this order: (1) your baseline, (2) three priority concepts with evidence, (3) your weekly routine, (4) your graphs and growth line, (5) your checkpoints and proof. Name the file: *FirstName LastName - WebXam Pretest Debrief and Study Plan - 2026-09-03.pdf*. Put the same line in the document header.

Test security. Do not copy, photograph, or share any test question. Use only the scores and broad concept areas actually provided in your report. Mark absent fields "not reported"; do not guess.

THE TEST YOU ARE PLANNING FOR

SEC 01

WebXam 072110 is this course's end-of-course test. A score of **65 percent** passes. I will announce the testing date. Each weight shows about how much of the test covers that domain.

DOMAIN	NAME	WEIGHT	IN PLAIN ENGLISH
Domain 1	Handling, Preparation, Storage and Disposal	about 54 of 100	lab safety, chain of custody, storing and preparing samples
Domain 2	Biotechnology Research and Experiments	about 46 of 100	designing an investigation, collecting data, statistics, drawing conclusions

Test weights are not your results. Name a lowest domain only when your scores support it.



Choose a resource you can open and name a specific action. If a resource will not open, use your class notes or ask me for help.

CATEGORY	YOUR CHOICES
1. Baseline (what your report says)	Copy the total and domain percentages actually reported. Mark missing fields "not reported," not zero or an estimate. Name the lowest domain only if the scores support it; name the biggest-weight domain from the table above. Label simulated values "simulated."
2. Priority concepts (choose three)	If scores identify your two weakest domains, choose one concept from each plus one of your choice. Otherwise choose three course concepts and label them "practice priorities, not report-identified weaknesses." Use broad concept names from the report or course menu, never test questions. For each, give one sentence of evidence from available report data or classwork.
3. Resources (choose one per concept)	The portal day pages and guided notes. The printed pack, SEC 02 Background and briefing. The lab simulations (Safety Practical, The Traces We Leave, Kastle-Meyer blood testing, DNA Evidence from the Scene, DNA Fingerprinting, Toxicology and Drug Delivery). The Anki flashcard deck for this course. The NotebookLM study guide. The lab manual procedures. Your Investigative Notebook.
4. Action (choose one per concept, from the 6 Rs)	Record a one-page Cornell note from the resource. Reduce it to ten flashcards. Review the flashcards from memory. Reflect : write what still confuses you. Recite : teach the concept aloud to someone in two minutes. Revise : redo a simulation or a practice set and correct your errors.
5. Schedule	A fixed day and time each week for each concept, at least 20 minutes, for example "Tuesday 7:00 PM, 20 minutes." Twelve weeks, from September 4 to November 27.
6. Target and growth line	A target score for the end of November of at least 65 percent. Graph reported baseline scores against the 65 pass line; leave unavailable bars blank. Draw the straight-line growth plan from week 0 to week 12, with the rate in points per week. Equal weekly gain is a planning assumption, not a promise.
7. Checkpoints and proof	October 2 (week 4) and October 30 (week 8). At each, one proof of learning you can show: a practice-set score, a photo of corrected flashcards, a teach-back recording, a simulation completion, or a self-check score. Write the score your line predicts at each checkpoint.
8. The honest limitation	One sentence naming the assumption your line makes (equal gain every week) and what you will change if the October 2 checkpoint comes in low.



Each criterion is scored on the descriptors below. A plan can score full marks with a low pretest score; the score is data, the plan is the work.

CRITERION	FULL (POINTS SHOWN)	PARTIAL (ABOUT HALF)	NOT YET (0)
A. Honest baseline 15 points	All available scores copied in percent; unavailable fields marked "not reported"; simulated values labeled. Lowest domain named only when scores support it; heaviest domain named from the test table.	An available score omitted, a simulated value unlabeled, or a supported lowest-domain comparison omitted. Correctly marking an unavailable field "not reported" is not a deduction.	No baseline, or numbers that do not match the report.
B. Three priority concepts, each with evidence 20 points	Three concepts with one evidence sentence each. Use the two weakest domains when reported scores identify them. Otherwise label course concepts as practice priorities and use available report data or classwork as evidence.	Three concepts but one lacks evidence, or reported weak domains are ignored when available. Missing domain data alone is not a deduction.	Fewer than three concepts, or concepts copied from a classmate's report, or a test question quoted.
C. Weekly routine that fits the concepts 30 points	For each concept: one resource, one 6 Rs action, a fixed day and time, at least 20 minutes, and the action really practices that concept (a flashcard deck for vocabulary, a simulation for a procedure).	Routine present but an action does not fit its concept, a time is missing, or a resource is vague.	"Study more" with no resource, action, or time.
D. Graphs and growth line 20 points	Bar graph of available scores with the axis at zero and the 65 pass line; unavailable bars blank. Growth plan from week 0 to week 12 to a target of at least 65; rate in points per week with arithmetic shown; checkpoint predictions from the line.	Graphs present but an axis does not start at zero, the rate is missing, or a checkpoint prediction is not shown.	No graphs, or a target below the pass line.
E. Coherence and the limitation 15 points	The five parts agree: available evidence leads to concepts, concepts to actions, and actions to checkpoint proof. Plain English names equal gain as a planning assumption, not guaranteed growth, and a concrete change if October 2 comes in low.	Parts mostly agree but one contradicts another, or the limitation is generic ("I will try harder").	Parts do not connect, or no limitation.

Scoring note. Partial credit is awarded per criterion. A plan built from the simulated report can earn full marks; its baseline row must say "simulated" and the plan is rewritten after the make-up test.





OHIO CSI FORENSIC DIVISION

WEBXAM 072110 · PRINCIPLES AND PRACTICE OF BIOMEDICAL TECHNOLOGY

Principles of Biomedical Science · take-home exam

FORM NO. WX-PBS-PRE-01
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DO NOT DISTRIBUTE ANSWER KEYS

SIMULATED PRETEST REPORT (PRACTICE DATA)

For students who have not taken the pretest yet

OFFICIAL

SIMULATED DATA. THESE ARE NOT YOUR SCORES. USE THEM TO PRACTICE THE PLAN UNTIL YOUR MAKE-UP PRETEST.

WHY YOU HAVE THIS SHEET

SEC 00

You did not take the WebXam pretest on September 3, so there is no real report for you yet. You still complete the take-home exam, because the grade is for a coherent plan, not for a score. Use the practice numbers below exactly as if they were yours, and write the word **SIMULATED** in your baseline row. After your make-up pretest, you will redo Parts 1 and 4 with your real numbers in class, and your plan will be revised to match.

Your make-up pretest. See Mr. Mendoza to schedule it; it takes 20 to 40 minutes and can be done during a study hall or before school. Do not ask a classmate about the questions.

SIMULATED PRETEST REPORT

SEC 01

ROW	SCORE	PASS LINE	WHAT IT MEANS
Domain 1: Handling, Preparation, Storage and Disposal	44 percent (SIMULATED)	65	21 points below the pass line
Domain 2: Biotechnology Research and Experiments	58 percent (SIMULATED)	65	7 points below the pass line
Total	51 percent (SIMULATED)	65	14 points below the pass line

Weak areas the simulated report lists: lab safety, chain of custody, storing and preparing samples (Domain 1); and, in Domain 2, reading a data table against a reference range and choosing the right graph.

WHAT TO PRACTICE UNTIL YOUR MAKE-UP TEST: CLEAR DIRECTIONS

SEC 02

- This week, Domain 1 first.** Open the portal day page for the current lesson and the printed pack, SEC 02 Background and briefing. Record one Cornell note page on lab safety, chain of custody, storing and

preparing samples. Reduce it to ten flashcards.

2. **Run one simulation from start to finish** (Safety Practical first, then The Traces We Leave). A simulation counts as practice only when you finish it and can say what each step was for.
3. **Practice the data skills.** On the WebXam Baseline sheet from September 4, use the simulated numbers above: make the bar graph against the 65 pass line, choose a target, draw the growth line, and compute the rate in points per week.
4. **Build your plan from the menu** on the rubric sheet (Categories and choices, SEC 02): three priority concepts, a resource and a 6 Rs action for each, a fixed weekly time, and the two checkpoints.
5. **Proof of learning by October 2:** one practice-set score or one teach-back, recorded on your plan.
6. **Schedule the make-up pretest with Mr. Mendoza** and write the date on your plan. When the real report arrives, replace the simulated baseline and re-check that your three concepts still match your weakest domains.

ASSIGNMENT 10 OF 28 Tue, Sep 1 about 80 minutes**Investigation Day 1: The Rules of Evidence**

Today we need to accomplish join an investigation unit, learn the one rule this whole case runs on, and prove you can tell an observation from an inference from an opinion.

Our goal is debate whether forensic and biomedical evidence should ever be trusted blindly, and defend a claim with reasons.

You have to turn in Written CER (3-5 sentences) arguing one side of the trust-the-evidence debate with a claim, one piece of evidence, and one reasoning sentence. Post your CER to the discussion board or hand in the written copy before you leave.

Schoology assignment: Wk2 D01 · The Rules of Evidence (PLTW 1.1.1)

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D01 Case A briefing pack (read this)** (4 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Read the Philosophy-for-Kids prompt: Can a lab result be wrong, and who is responsible when it is?

3

WRITE

List two reasons a measurement could mislead an investigator or doctor.

HINT Evidence earns conclusions. Nothing else does.

4

DO

Pick a side: evidence is objective truth vs. evidence is only as good as its method.

5

WRITE

Argue your position aloud in your small group using one reason and one example.

6

TURN IN

Post a short written CER: claim, one piece of evidence, one sentence of reasoning.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk2 D01 · The Rules of Evidence (PLTW 1.1.1)**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Aug 31 · Investigation Day 1 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

The case begins today.

Real detectives and forensic scientists live by one rule: they can only claim what they can show. A detective who is sure a suspect is guilty but has no evidence has no case, while a detective with evidence does not need to be sure, because the evidence speaks for itself. Today you learn to tell what you SEE from what you GUESS, which is the first skill every investigator is taught, and you practice it on your first exhibit.

OBJECTIVE

Today you will join an investigation unit, learn the one rule this whole case runs on, and prove you can tell an observation from an inference from an opinion.

Take-home (the ten-year idea): Evidence earns conclusions. Nothing else does.

For the next five weeks this class is an investigations unit working a death case. Real agencies live and die by one discipline: what you can **SHOW** beats what you **FEEL**, every time. A detective who is sure but has no evidence has nothing. A detective with evidence does not need to be sure; the evidence speaks.

Three kinds of statements will come out of your mouth in this room. An **OBSERVATION** is what your senses record: the stain is reddish-brown, 40 cm from the door. An **INFERENCE** is a conclusion built on observations: the stain's drip pattern suggests it fell from about waist height. An **OPINION** is a feeling with no load-bearing structure: that stain looks suspicious. Only the first two belong in a case file, and they must be labeled as what they are.

Analogy: think of a referee reviewing a replay. The replay footage is observation. The call the referee announces is inference, built strictly on the footage. The crowd booing is opinion. **LIMIT** of the analogy: a replay can be rewound; a crime scene degrades every time someone touches it. That is why tomorrow is about custody.

One more tool you will use every single day: **CER**. Claim (what you say happened), Evidence (the exhibits that support it), Reasoning (the rule that connects them). Every exit slip in this unit is a **CER**. By day 18 you will write a full case report in this structure, and it will feel natural because you practiced it eighteen times.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
evidence	a fact or object you can point to that supports or weakens a claim	receipts, not vibes
observation	what your senses actually record	the camera footage
inference	a conclusion you build on top of observations	the referee's call after the replay
bias	anything that pulls your judgment before the evidence gets a vote	rooting for one team while you referee
CER	Claim, Evidence, Reasoning: the sentence structure of every honest conclusion	the load-bearing frame of a report

YOUR ROLE

You are a new investigator taking the unit's entrance exam.

THE SITUATION

Six statements about the same photograph are printed on your exit slip. Some are observations, some are inferences, some are opinions dressed up in confident language.

THE RULE YOU APPLY

Observation = senses only. Inference = observation plus a stated rule. Opinion = neither.

WHAT YOU PRODUCE

Sort all six, then write one CER defending your hardest call.

Claim ceiling. You may classify the statements. You may not conclude anything about what happened in the photo; you were not there and the photo is one angle.

WHAT THIS UNLOCKS

Tomorrow you earn scene access by qualifying on safety and custody.

PLTW ANCHOR AND INTERACTIVE LAYER

REF

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- Portal: mendozabiomed.org/learn/pltw-pbt (today's day page and guided notes)

myPLTW student access is down for technical reasons. When it is restored, this day's PLTW anchor is completed online; until then the portal simulation and these printed materials carry the day.

INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Draft the team charter; learn the scene-map page you will own.

B Trace

Draft the team charter; preview the comparison exhibits you will own.

C Serology and DNA

Draft the team charter; preview the match matrix you will own.

D Toxicology and Chemistry

Draft the team charter; preview the tox report you will own.

E Medical Examiner

Draft the team charter; preview the body diagram you will own.

F Records and Timeline

Draft the team charter; set up the master timeline spread.

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Team roster and charter page
- Ethics and custody pledge
- Day 1 Cornell page

DAILY SUBMISSION FORM: ETHICS CER EXIT SLIP**JH-26-0831-A / D1**

- ☐ Six statements sorted O / I / OP
- ☐ One CER defending your hardest call
- ☐ Signed ethics pledge line

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED

ASSIGNMENT 11 OF 28 Wed, Sep 2 about 80 minutes**Investigation Day 3: Qualify for the Scene**

Today we need to accomplish pass the safety practical and learn chain of custody, the two qualifications that earn you access to a death scene.

Our goal is identify core lab safety rules, PPE, and how to read a Safety Data Sheet before completing the PLTW intro task.

You have to turn in SDS lookup card: for one assigned chemical, record the name, hazard class (Section 2), required PPE (Section 8), first-aid steps (Section 4), and disposal method (Section 13). Hand in your completed SDS card at the end of class.

Schoology assignment: Wk3 D03 · Qualify for the Scene

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D03 Case A briefing pack (read this)** (3 pages); then **D03 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

Take teacher notes on the four PPE categories and when each is required.

3

DO

Walk through the 16 sections of an SDS and find the hazard and first-aid sections.

HINT Evidence you cannot account for is evidence you do not have.

4

DO

Match three common lab chemicals to their hazard pictograms.

5

READ

Open the PLTW launch lesson and complete the lab-safety contract task online.

6

WRITE

Write one independent variable and one control you will track in any experiment.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk3 D03 · Qualify for the Scene**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 8 · Investigation Day 3 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that a number means nothing until it stands next to its reference range.

Real crime labs will not let anyone near evidence until they pass safety training and learn the chain of custody, because one unaccounted-for minute and a defense lawyer gets the whole exhibit thrown out of court. Today you earn your way onto the scene the same way the pros do: prove you can work safely and keep an unbroken record.

OBJECTIVE

Today you will pass the safety practical and learn chain of custody, the two qualifications that earn you access to a death scene.

Take-home (the ten-year idea): Evidence you cannot account for is evidence you do not have.

BACKGROUND AND BRIEFING (READ THIS FIRST)

SEC 02

No agency lets an unqualified person cross the tape. Qualification means two things: you will not hurt yourself or others (safety), and you will not destroy the case (custody).

Safety first. Every chemical in a lab has an SDS, a Safety Data Sheet: its ID card. It tells you what the substance does to eyes, skin, and lungs, and what to do in the first sixty seconds of an exposure. You never need to memorize an SDS; you need to know it exists, where it lives, and how to read the hazard section fast.

Custody second. Chain of custody is the unbroken written record of who held a piece of evidence, when, where, and why, from the moment it is tagged to the moment it reaches a courtroom. One gap and a defense attorney deletes the whole exhibit. Analogy: a relay race baton with a signature required at every handoff. Drop it once, the team is disqualified, no matter how fast everyone ran. LIMIT of the analogy: a baton is the same baton after a drop; evidence can be contaminated invisibly, which is worse, because nobody knows the race was lost.

The custody log has four columns you will fill dozens of times: item, date and time, released by, received by. Boring on purpose. Boring is what unbreakable looks like.

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
chain of custody	the unbroken written record of who held evidence, when, and why	a relay baton with a signature at every handoff
SDS	Safety Data Sheet: a chemical's ID card listing its hazards and first aid	the player card for a chemical

THE DECISION OF THE DAY

SEC 03

YOUR ROLE

You are the evidence officer for your team.

THE SITUATION

Four short scenarios describe evidence being handled: a bagged item left on a lunch table, a swab passed hand to hand without a signature, a photographed item moved before measurement, a sealed bag opened to show a friend.

THE RULE YOU APPLY

Custody breaks when possession is unaccounted for OR the item changes before documentation.

WHAT YOU PRODUCE

Mark each scenario intact or broken, cite the exact moment it broke, and write the one-line fix.

Claim ceiling. You may judge the handling. You may not conclude the evidence is worthless; a judge weighs that. Your job is the honest record.

WHAT THIS UNLOCKS

Next class the case opens.

PLTW ANCHOR AND INTERACTIVE LAYER

REF

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- **Safety Practical simulation** mendozabiomed.org/learn/lab-sim/shared-safety-practical
- Portal: Safety Practical simulation (pre-lab gate), day page, guided notes

myPLTW student access is down for technical reasons. When it is restored, this day's PLTW anchor is completed online; until then the portal simulation and these printed materials carry the day.

INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Own the practice custody entry demonstration at the conference.

B Trace

Locate and read the SDS hazard section for one classroom chemical; brief it.

C Serology and DNA

Locate and read the SDS for a second chemical; brief it.

D Toxicology and Chemistry

Locate and read the SDS for a third chemical; brief it.

E Medical Examiner

Map the room: eyewash, extinguisher, exits, on the notebook scene-map page margin.

F Records and Timeline

Add day 3 to the timeline.

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Ethics and custody pledge (countersign)
- Master evidence log header row (practice entry)
- Day 3 Cornell page

DAILY SUBMISSION FORM: SIGNED SAFETY AND CUSTODY PLEDGE

JH-26-0831-A / D3

- ☐ Safety practical checklist complete
- ☐ Four scenarios marked with the breaking moment
- ☐ Pledge signature

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 8 · Investigation Day 3 of 18 · Qualify for the Scene

OFFICIAL

WEBXAM · DOMAIN 1 HANDLING, PREPARATION, STORAGE AND DISPOSAL · OHIO OUTCOME 5.1

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 8, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real crime labs will not let anyone near evidence until they pass safety training and learn the **chain of custody**, because one unaccounted-for minute and a defense lawyer gets the whole exhibit thrown out of court. Today you earn your way onto the scene the same way the pros do: prove you can work safely and keep an unbroken record.

Today you will: pass the safety practical and learn **chain of custody**, the two qualifications that earn you access to a death scene.

The ten-year idea: Evidence you cannot account for is evidence you do not have.

CHAIN OF CUSTODY: the unbroken written record of who held evidence, when, and why. Analogy to hold onto: a relay baton with a signature at every handoff.

SDS: Safety Data Sheet: a chemical's ID card listing its hazards and first aid. Analogy to hold onto: the player card for a chemical.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

No agency lets an unqualified person cross the tape. Qualification means two things: you will not hurt yourself or others (safety), and you will not destroy the case (custody).

Safety first. Every chemical in a lab has an **SDS**, a Safety Data Sheet: its ID card. It tells you what the substance does to eyes, skin, and lungs, and what to do in the first sixty seconds of an exposure. You never need to memorize an SDS; you need to know it exists, where it lives, and how to read the hazard section fast.

Custody second. **Chain of custody** is the unbroken written record of who held a piece of evidence, when, where, and why, from the moment it is tagged to the moment it reaches a courtroom. One gap and a defense attorney deletes the whole exhibit. Analogy: a relay race baton with a signature required at every handoff. Drop it once, the team is disqualified, no matter how fast everyone ran. LIMIT of the analogy: a baton is the same baton after a drop; evidence can be contaminated invisibly, which is worse, because nobody knows the race was lost.

The custody log has four columns you will fill dozens of times: item, date and time, released by, received by. Boring on purpose. Boring is what unbreakable looks like.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D03-A1

The reading says an SDS is a chemical's ID card. Name two things the reading says the card tells you, and copy the first three words of the sentence you used.

PBS-U1-
D03-A2

Why does the reading say you never need to memorize an SDS? What do you need to know instead?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Judging one custody scenario with the rule, plus a unit conversion

Practice case, not ours: a coffee mug is collected from a desk in a break-in at an office, and here is what the log shows.



What to notice: Notice the blank signature rows on the clipboard: an intact seal proves nothing if the paper has a gap.

1. Read the record as written: 10:14 AM the mug is bagged and signed out by the evidence officer (the team member who signs for every item); 10:20 AM the officer hands the bag to a coworker in the hallway, no signature; 10:31 AM the coworker signs it in at the evidence table.
2. Apply test 1 of the rule (possession unaccounted for?): from 10:20 to 10:31 nobody signed for the bag, so possession is on nobody's paper. $10:31$ minus $10:20 = 11$ minutes unaccounted for.
3. Apply test 2 of the rule (item changed before documentation?): the bag stayed sealed and the mug was photographed at 10:12 before bagging, so no change before documentation.
4. Decide: test 1 failed, so custody is BROKEN. Name the exact moment: the 10:20 AM hallway handoff with no signature.
5. Write the one-line fix: every handoff gets a released-by and received-by signature, on the spot, before the bag leaves a hand.
6. Bonus unit conversion in the same style as B3: the spill kit used at the office absorbs 2.5 liters; the spill was 800 milliliters. 800 mL divided by $1,000 \text{ mL per L} = 0.8 \text{ L}$. 0.8 L is less than 2.5 L , so one kit was enough. Units on every line.

Finished product: Broken at 10:20 AM, 11 minutes of possession unaccounted for; fix is a signature at every handoff. The mug looks fine, but the record cannot vouch for it for those 11 minutes.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The case had not opened yet. In class, teams passed the safety practical (goggles and gloves, spill walk-through, reading the hazard section of a Safety Data Sheet), located the safety equipment in the room, and then judged the four custody scenarios printed on this sheet. No evidence was collected today.

Safety equipment found in the 3-minute race	Eyewash station: at the back sink. Fire extinguisher: by the door. Exits: the classroom door and the marked second exit. SDS binder: on the shelf at the teacher station (a Safety Data Sheet, or SDS, is a chemical's ID card listing its hazards and first aid).
SDS chemicals briefed by Teams B, C, and D	3 percent hydrogen peroxide (used later in the blood screen): hazard is eye and skin irritation; first aid is rinse eyes 15 minutes. Ethanol (used to clean swab tools): flammable, keep from flame; skin contact means wash with water. Phenolphthalein solution (the color indicator in the blood screen): eye irritant; first aid is rinse 15 minutes and report.
Where the hazard and first-aid facts live on any SDS	Section 2 (hazards) and Section 4 (first-aid measures). Sections are numbered the same on every SDS, so you look them up, you do not memorize them.
The custody rule used in the scenario sort	Custody breaks when possession is unaccounted for OR the item changes before it is documented. Possession means who physically has the item right now. Documented means written in the four columns: item, date and time, released by, received by.
The four scenarios judged (as printed on the sheet)	1. bagged item left on a lunch table. 2. swab passed hand to hand with no signature. 3. photographed item moved before it was measured. 4. sealed bag opened to show a friend, then resealed. Judge each with the rule; your judgment and fix are your own work.
Practice custody entry shown at conference (Team A)	Item: practice swab P-1. Date and time: today, 9:05 AM. Released by: Team A evidence officer. Received by: teacher station. That single row is the whole shape of every custody row you will write this unit.
Eyewash numbers for B3	Run time 15 minutes; flow 1.5 liters per minute; 1 liter = 1,000 milliliters. Do the multiplication yourself and keep units on every line.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

The four custody scenarios below are the ones from today's decision. Judge each one with the rule: custody breaks when possession is unaccounted for OR the item changes before it is documented.

POSSESSION: who physically has the item at this moment. If nobody can say, possession is unaccounted for.

DOCUMENTED: written down with the four columns: item, date and time, released by, received by.

SCENARIO	INTACT OR BROKEN?	THE EXACT MOMENT IT BROKE (OR WRITE INTACT)	ONE-LINE FIX
1. A bagged item is left on a lunch table while the team eats.			
2. A swab is passed hand to hand across the room without a signature.			
3. A photographed item is moved before anyone measures its position.			
4. A sealed evidence bag is opened to show a friend, then resealed.			

PBS-U1-
D03-B1

☐

Table complete: every scenario judged, every broken one names its moment, every row has a fix. (Scored on the table.)

PBS-U1-
D03-B2

☐

Scenario 4 was resealed, so the item looks exactly as before. Explain in two sentences why custody is still broken.

PBS-U1-
D03-B3

☐

Practice numbers. An eyewash station must run for 15 minutes at 1.5 liters per minute. How many liters is that? Convert your answer to milliliters (1 liter = 1,000 milliliters). Show the work with units on every number.

PART C · WRITE THE CALL

SEC 03

Pick the scenario you marked broken that worries you most. Write a custody incident report that a supervisor who was not in the room could act on. Cover five things: what the item was, what happened to it and when, who had it, why the record is now broken, and what happens to the item next. Five to seven sentences, plain words, no blame words.

Claim ceiling. You may judge the handling. You may not conclude the evidence is worthless; a judge weighs that. Your job is the honest record.

PBS-U1-
D03-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D03-D1

☐

Use **chain of custody** and **SDS** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D03-E1

☐

Where does the hazard information for any chemical in this room live?

PBS-U1-
D03-E2

☐

Name the four columns of the custody log.

PBS-U1-
D03-E3

☐

A perfectly clean lab result from a custody-broken sample is worth what?

TURN IN

SLIP

Signed safety and custody pledge: Safety practical checklist complete; Four scenarios marked with the breaking moment; Pledge signature.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: Safety Practical simulation at mendozabiomed.org/learn/lab-sim/shared-safety-practical.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Handling, Preparation, Storage and Disposal (53.93 percent of the test), Ohio outcome 5.1 Handling, Preparation, Storage and Disposal.

Ohio Health Science	5.1.1	Use standard operating procedures for the safe use of instruments, equipment, and gas cylinders.
Ohio Health Science	5.1.2	Locate and use safety data sheets to prepare and interpret labels for chemicals, supplies, and to identify hazards associated with handling and storing chemical materials.
Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	1.3.2	Follow protocols and practices necessary to maintain a clean, safe, and healthy work environment.
Ohio Health Science	4.3.4	Identify and use appropriate level of personal protective equipment (PPE) when encountering body fluids, potential of splashing, or respiratory droplets.
PLTW PBS framework	GLP-B.1	Use and apply principles of measurement.
Ohio Health Science	1.2.12	Use technical writing skills to complete forms and create reports.
PLTW PBS framework	EXD-A.4	Maintain a detailed repeatable account of an experiment in a physical or digital laboratory notebook.
PLTW PBS framework	ERM-A.1	Demonstrate professional standards, such as creativity, perseverance, honesty, integrity, and accountability, which should be exhibited by biomedical professionals.
Common Core	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation of a complex process; summarize accurately.
Common Core	RST.9-10.4	Determine the meaning of symbols, key terms, and domain-specific words as used in a scientific or technical context.
Common Core	WHST.9-10.2	Write informative or explanatory texts, including scientific procedures and technical processes, with precise language and domain-specific vocabulary.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-8	Obtaining, evaluating, and communicating information: read scientific texts to summarize and evaluate claims and evidence.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do3-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.03a	Read a Safety Data Sheet for the hazard, the first-aid step, and where the sheet lives	items A1, A2, E1
PBS.S.03b	Judge whether chain of custody held, name the exact moment it broke, and write the fix	items B1, B2, E2, E3
PBS.S.03c	Convert units and report a quantity with the right unit	items B3
PBS.S.03d	Write a short technical report a stranger could act on	items C1, D1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 12 OF 28 Fri, Sep 4 about 80 minutes**Investigation Day 2: Numbers That Do Not Lie to You**

Today we need to accomplish calibrate the data tools this case will lean on: mean, median, range, reference ranges, and choosing a graph that tells the truth.

Our goal is build a graph from collected data and compute descriptive statistics to summarize a sample.

You have to turn in Data table with three trials and units, calculations of mean/median/range/SD, a correctly labeled graph, and a 3-sentence CER explaining what the standard deviation reveals about precision. Upload a photo of your notebook data page and graph to the unit tracker before Friday.

Schoology assignment: Wk2 D02 · Numbers That Do Not Lie to You (PLTW 1.1.1)

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D02 Case A briefing pack (read this)** (3 pages); then **D02 Case A webxam baseline sheet** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

Enter Wednesday's measurements into a data table with labeled units.

3

DO

Calculate mean, median, range, and standard deviation for your sample.

HINT A number means nothing until it stands next to its reference range.

4

DO

Choose an appropriate graph type and plot the data with titled axes.

5

WRITE

Write a CER: what does the spread of data tell you about precision?

6

DO

Identify one limitation that the standard deviation reveals about your method.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk2 D02 · Numbers That Do Not Lie to You (PLTW 1.1.1)**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D02
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 4 · Investigation Day 2 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that evidence earns conclusions. Nothing else does.

Real analysts never trust a single number on its own. They compare it to what is normal and they chart it to see whether it is climbing, falling, or holding steady. Today you tune up those same data tools, because in about two weeks a lab number is going to land on your desk and you will need to know whether it is boring or case-cracking.

OBJECTIVE

Today you will calibrate the data tools this case will lean on: mean, median, range, reference ranges, and choosing a graph that tells the truth.

Take-home (the ten-year idea): A number means nothing until it stands next to its reference range.

BACKGROUND AND BRIEFING (READ THIS FIRST)

SEC 02

In two weeks a lab panel will land on your desk with a number like 612 on it. Whether that number is boring or case-cracking depends on one question: what is normal? A reference range is the interval where healthy values usually land. Analogy: every road has its own speed limit; 55 is legal on the highway and reckless in a school zone. A lab value is only high or low relative to ITS range. LIMIT of the analogy: speed limits are laws with hard edges; biology is a distribution, and healthy people sometimes sit slightly outside the range. One out-of-range number is a flag, not a verdict.

Three summary numbers you will use constantly: MEAN (add and divide; fair when values cluster), MEDIAN (the middle value; fair when one outlier would drag the mean), RANGE (spread; tells you how much the data disagrees with itself).

Choosing the graph: BAR for comparing categories (blood types found at a scene), LINE for change over time (body temperature falling), SCATTER for testing whether two things move together (dose vs response). The wrong graph is not just ugly, it can lie: a bar chart whose axis starts at 90 instead of 0 makes a tiny difference look huge.

The skill today is skepticism with a pencil: before you accept any chart, check the axis start, the units, and whether the graph type fits the question.

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
reference range	the interval where healthy values usually land	the speed limit for a lab number

THE DECISION OF THE DAY

SEC 03

YOUR ROLE

You are the team's data analyst.

THE SITUATION

Three practice datasets (category counts, a temperature series over hours, dose-response pairs) plus one deliberately misleading chart with a truncated axis.

THE RULE YOU APPLY

Match graph type to question type; report center with the statistic the data shape deserves; every axis starts where honesty starts.

WHAT YOU PRODUCE

One correct graph per dataset, plus a two-sentence callout of exactly how the misleading chart misleads.

Claim ceiling. You may describe what these practice data show. They are practice data; they prove nothing about our case yet.

WHAT THIS UNLOCKS

Next class you qualify for the scene: the safety practical and chain of custody.

PLTW ANCHOR AND INTERACTIVE LAYER

REF

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes; the WebXam Baseline sheet (graph your start, predict your growth) carries today's data

myPLTW student access is down for technical reasons. When it is restored, this day's PLTW anchor is completed online; until then the portal simulation and these printed materials carry the day.

INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Own the axis-honesty checklist; post it by the board.

B Trace

Build the bar graph station answer and brief it.

C Serology and DNA

Build the line graph station answer and brief it.

D Toxicology and Chemistry

Build the scatter station answer and brief it; this is your team's home turf.

E Medical Examiner

Compute the summary statistics table and brief the mean-vs-median call.

F Records and Timeline

Start the unit timeline: enter days 1 and 2 as its first two events, then log which graph goes with which future evidence type.

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Day 2 Cornell page
- Vocabulary bank: reference range entry with your own analogy

DAILY SUBMISSION FORM: GRAPH EXIT SLIP

JH-26-0831-A / D2

- ☐ Three graphs, labeled axes and units
- ☐ Mean, median, range table
- ☐ Misleading-chart callout (two sentences)

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Investigator qualification file

FORM NO. CSI-1-D02-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

WEBXAM BASELINE SHEET

Sep 4 · Investigation Day 2 of 18 · John Hay teacher-created practice

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOME 5.8

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 4, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Yesterday you took a practice version of **WebXam** and wrote a study plan. Today the numbers on that report stop being a grade and become **data**: facts you can chart, compare, and use to make a decision. Real biomedical labs do exactly this with a patient's first blood draw.

The first number is not the verdict. It is the **baseline**, the starting point every later number is measured against.

WEBXAM: Ohio's end-of-course test for this class. Its test code is Principles and Practice of Biomedical Technology (072110). Mr. Mendoza will announce the testing date. The pretest helps us plan practice. A score of **65 PERCENT** or higher passes.

DOMAIN: one big topic area the test is built from. This test has two. Domain 1, Handling, Preparation, Storage and Disposal, carries about 54 of every 100 points (lab safety, chain of custody, storing and preparing samples). Domain 2, Biotechnology Research and Experiments, carries about 46 (designing an investigation, collecting data, statistics, drawing conclusions). Today's sheet lives in Domain 2.

BASELINE: your first measurement, taken before any training. Its job is to show where you start so growth can be measured, not to label you.

Two rules from today's pack apply to every graph on this sheet. First, the axis starts where honesty starts: at zero. Second, match the graph to the question: a **bar graph** compares categories, a **line graph** shows change over time.

WORKED EXAMPLE, STEP BY STEP (SIMULATED PRACTICE DATA)

SEC 00A

SIMULATED report, not school results. Domain 1: 48 percent. Domain 2: 56 percent. Total: 52 percent. Target chosen: 70 percent by the end of November.

1. Record the baseline in the table with the unit percent. Points to the pass line for the total: $65 \text{ minus } 52 = 13$ points.
2. Draw the three bars to 48, 56, and 52 on an axis that starts at 0. The dashed line at 65 is the pass line. All three bars sit below it, so the one-sentence reading is: "My graph shows every score below the pass line, with Domain 1 lowest."
3. Graph the simulated class tally below. For 22 scores, count to positions 11 and 12; both fall in the 40 to 59 bin. This is the median bin, not an exact median.
4. Rate: (target minus baseline) divided by 12 weeks = $(70 \text{ minus } 52) \text{ divided by } 12 = 18 \text{ divided by } 12 = 1.5$ points per week.
5. October 2 checkpoint (week 4): baseline plus 4 times the rate = $52 + 4 \times 1.5 = 52 + 6 = 58$ percent. Plot the point at week 4, height 58.
6. Claim, evidence, reasoning: "My practice target is 70 percent by the end of November. My baseline is 52 and my line needs 1.5 points a week. I will do the Tuesday SDS retrieval and the Thursday portal practice set. Those target Domain 1, my lowest domain. The line assumes equal gain every week; if my October 2 score is under 55, I add a second retrieval day."

ABSENT OR NEW? USE THIS SIMULATED PRACTICE DATASET

SIMULATED pretest report: Domain 1: 44 percent. Domain 2: 60 percent. Total: 51 percent. These are practice values, not school results. Label each row "simulated."

SIMULATED class tally (22 practice scores): 0 to 19: 1. 20 to 39: 6. 40 to 59: 9. 60 to 79: 5. 80 to 100: 1.

Use these values and write "SIMULATED" at the top of Parts B and D. When your own report arrives, redo Parts B, C, and E with its reported scores on a second copy. Mark missing scores "not reported."

PART A · READ THE BRIEFING

SEC 01

Answer from the text above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D02-A1

Which domain carries more points, and by about how much? Cite the sentence.

PBS-U1-
D02-A2

In your own words, what is a baseline for, and what is it not for? Cite the sentence.

Copy only the scores your report provides. If it shows only a total, fill the Total row and write **not reported** for each missing domain score. Leave its points calculation and bar blank. Do not guess domain scores. If you use the complete practice dataset above instead, label every row **simulated**. Keep actual and simulated datasets separate.

PERCENT: a score out of 100. A score of 52 percent means 52 out of every 100 points.

ROW	YOUR SCORE (PERCENT)	POINTS TO THE PASS LINE (65 MINUS YOUR SCORE)	ACTUAL, SIMULATED, OR NOT REPORTED?
Domain 1: Handling, Preparation, Storage and Disposal			
Domain 2: Biotechnology Research and Experiments			
Total			

PBS-U1-
D02-B1

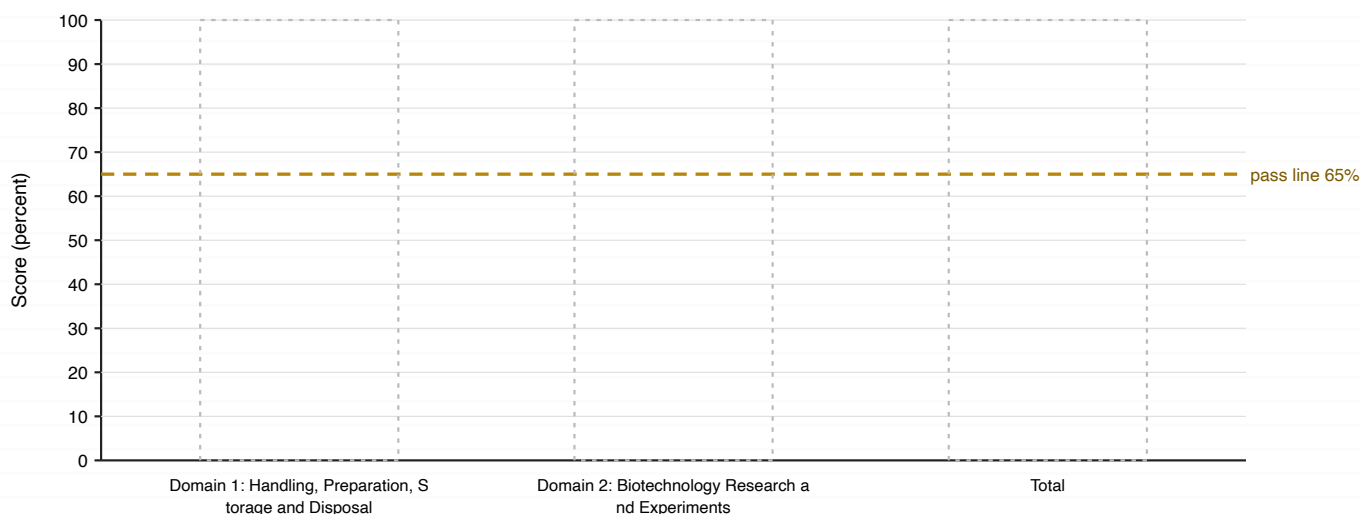
Table complete: scores use percent; sources are labeled; missing scores say "not reported." (Scored on the table itself; no writing needed here.)

PBS-U1-
D02-B2

Show the subtraction for the Total row. If your total is already above 65, write how many points above the line you are, and label it "above."

Draw a bar for each score you have. Leave a missing score blank, not zero. Shade each bar to match its score. The dashed gold line is the pass line at 65 percent, the **reference line** every bar is judged against.

REFERENCE LINE: a fixed value drawn on a graph so you can see at a glance whether each measurement is above or below it. On a lab report it is the edge of the reference range. Here it is the pass score.



PBS-U1-
D02-C1



Graph check: axis starts at 0, each bar is labeled, each bar's top matches the table, the pass line is used in your one-sentence reading of the graph. Write that sentence: "My graph shows ..."

PART D · GRAPH 2: THE CLASS PICTURE, NO NAMES

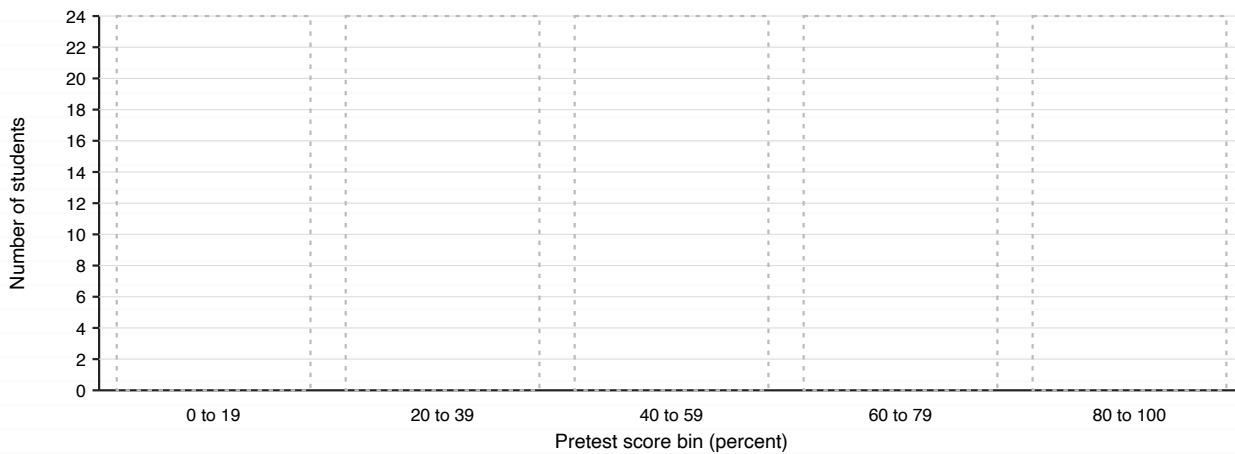
SEC 04

Mr. Mendoza will post a **tally** on the board: how many students scored in each bin. No names, no individual scores. Copy the tally, then draw the bars.

TALLY: a count of how many items fall in each group. The five labeled score bins turn a list of scores into a shape you can read.

HISTOGRAM: a bar graph of a tally. The bins sit in order along the bottom, so the shape shows where most people are and how spread out the class is.

BIN (PERCENT)	0 TO 19	20 TO 39	40 TO 59	60 TO 79	80 TO 100
Number of students					



MEDIAN: the middle ordered score, or the average of the two middle scores for an even count. Count through the tally to locate the middle position(s). If they fall in different bins, report both bins; an exact median needs raw scores.

RANGE: highest score minus lowest score. A grouped tally shows occupied bins, not the exact range. Exact mean, mode, median, range, and standard deviation need raw score values. Do not use bin midpoints as actual scores.

PBS-U1-
D02-D1

Histogram drawn: five bars, heights match the tally, axis starts at 0.

PBS-U1-
D02-D2

Middle-score bin(s): _____ Occupied bins: from _____ to _____. Show the count to the middle position(s). The occupied bins are not an exact range.

PBS-U1-
D02-D3

Mean or median: which summary number is fairer for this class picture, and why? (Hint from the pack: what does one very high or very low score do to a mean?)

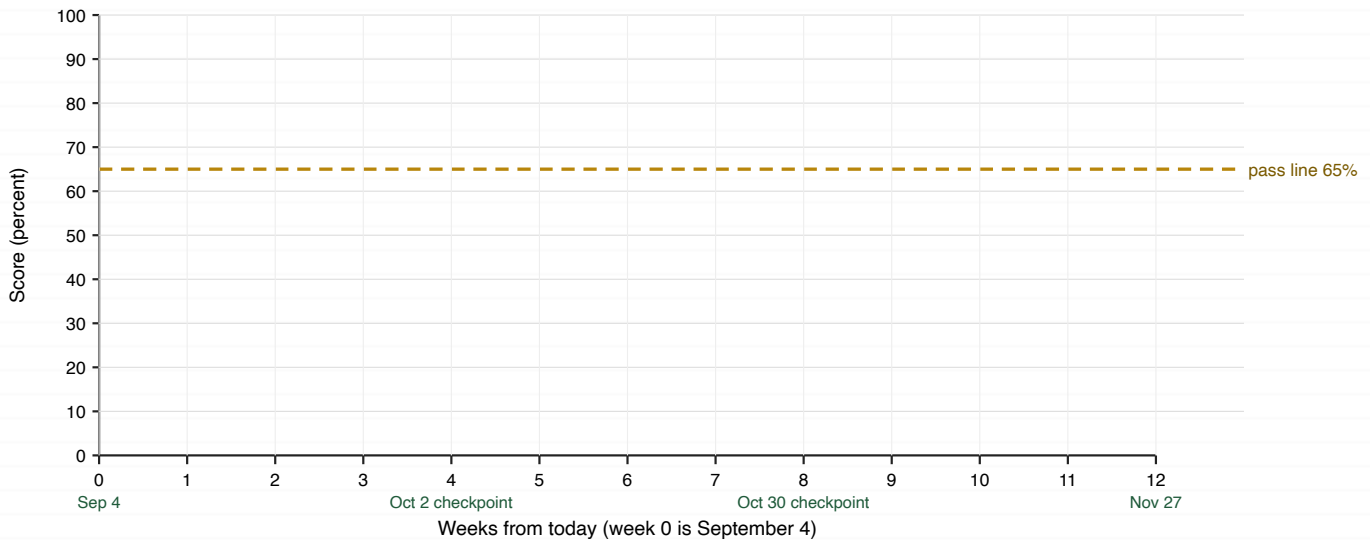
PART E · GRAPH 3: PREDICT YOUR GROWTH

SEC 05

Pick a **target**: the score you are aiming for at the end of November, at least 65. Plot your baseline total at week 0 and your target at week 12. Connect them with a straight line. That line is a **projection**: a plan drawn as if you gain the same number of points every week.

PROJECTION: a line that extends what you know today into the future under a stated assumption. Ours assumes equal gain every week. Real learning jumps after a unit and stalls in a busy week. That is why the class checks the real number at week 4 and week 8, then redraws the line.

RATE: how much a value changes per unit of time. Here: points gained per week, which is (target minus baseline) divided by 12 weeks. On the graph, the rate is the steepness of your line.



PBS-U1-
D02-E1

Target: _____ percent. Baseline total: _____ percent. Line drawn from week 0 to week 12.

PBS-U1-
D02-E2

Rate: (target minus baseline) divided by 12 weeks = _____ points per week. Show the work with units.

PBS-U1-
D02-E3

Prediction: at the October 2 checkpoint (week 4), your line says you should be at about _____ percent. Show the work: baseline plus 4 times the rate. Then finish this sentence: "If my October 2 score is far below this, the first thing I will change is ..."

PART F · WRITE THE CALL: CLAIM, EVIDENCE, REASONING

SEC 06

One paragraph, five to seven sentences. **Claim:** your target and the date. **Evidence:** your baseline, your rate, and two study actions from yesterday's plan (name the resource and the day). **Reasoning:** why those actions should produce that rate, and the one assumption the straight line makes. End with what would make you revise the target.

Claim ceiling. A projection is a plan you can check, not a promise of your real test score. The strongest allowed sentence is "if I keep this rate, the line reaches my target." Nothing on this sheet predicts the actual WebXam result.

PBS-U1-
D02-F1

☐

Your paragraph:

PART G · VOCABULARY IN USE AND SELF-CHECK

SEC 07

PBS-U1-
D02-G1

☐

Use **baseline** and **rate** correctly in one sentence about your own graph.

Self-check. Answer in one line each. These come from today's pack.

PBS-U1-
D02-G2

☐

Your data has one huge outlier. Mean or median, and why?

PBS-U1-
D02-G3

☐

Your score measured every four weeks: which graph type, and why?

PBS-U1-
D02-G4

☐

A bar chart's axis starts at 50 instead of 0. What does that do to a small difference?

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Domain 2 Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	5.8.4	Establish and implement procedures for systematic collection, organization and use of data.
Ohio Health Science	5.8.8	Compute measures of central tendency and dispersion to interpret results and draw conclusions.
Ohio Health Science	5.8.10	Create, interpret, and use tabular and graphical displays and describe the data.
Ohio Health Science	5.8.11	Draw conclusions and propose next steps based on observations and data analysis, recognizing that experimental results must be open to the scrutiny of others.
Ohio Health Science	1.2.12	Use technical writing skills to complete forms and create reports.
PLTW PBS framework	EXD-B.2	Display data appropriately and accurately in digital or written form (graphs, tables, diagrams).
PLTW PBS framework	EXD-B.3	Perform necessary calculations to analyze experimental data.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
PLTW PBS framework	CCP-B.1	Use mathematical computations to interpret data.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	HSS-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (range, standard deviation).
Common Core	HSS-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
Common Core	HSS-ID.C.7	Interpret the slope (rate of change) and the intercept of a linear model in the context of the data.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
Common Core	HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	MP.4	Model with mathematics.

NGSS	SEP-4	Analyzing and interpreting data: analyze data using tools, technologies, and models to make valid and reliable scientific claims.
NGSS	SEP-5	Using mathematics and computational thinking: use mathematical representations to describe and support explanations and predictions.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do2-E2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into five skills:

PBS.S.02a	Record reported scores with units; label simulated and missing values	items B1, B2
PBS.S.02b	Build an honest graph: right type, labeled, axis at zero, read against a reference line	items C1, D1, E1
PBS.S.02c	Compute and choose center and spread (median, range, mean) for the data shape	items D2, D3, G2
PBS.S.02d	Use a straight-line model: rate per week and a checkpoint prediction	items E2, E3, G3
PBS.S.02e	Defend a quantitative claim with evidence and name its assumption	items A1, A2, F1, G1, G4

Mastery rule. A skill is on track when at least two of its items score 2. A skill below that routes you to the Day 2 pack, SEC 02 (Background and briefing), and to the Graphing and statistics page on the portal. It also comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 13 OF 28 Wed, Sep 9 about 80 minutes**Investigation Day 4: The Case Opens**

Today we need to accomplish hear the dispatch call, meet the victim on paper, learn manner versus cause of death, and open the two organizers that will run the whole unit: the timeline and the suspect matrix.

Our goal is open your section's case: record what each released document states, label what you add, start the timeline with sources, and write one open question for the scene walk.

You have to turn in Daily Evidence Sheet, Parts A to E: an initial observations log of ten entries labeled O or I, first timeline entries with a source column, and one open question for the scene walk with its Part C explanation. Hand in the paper sheet or submit one PDF of it to your section's Wk3 D04 · The Case Opens (PLTW 1.1.1) assignment by September 10 at 11:59 PM. Notebook pages stay in your Investigative Notebook.

Schoology assignment: Wk3 D04 · The Case Opens (PLTW 1.1.1)

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D04 Case A briefing pack (read this)** (6 pages); then **D04 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Read the Day 4 briefing and the grouped glossary; complete Part A of the Daily Evidence Sheet from the assigned reading.

3

WRITE

Record ten entries in the initial observations log, each labeled O or I, each with its source.

HINT Cause is what stopped the body. Manner is the story of how it came to happen. They are different questions with different evidence.

4

DO

Start the first timeline in Part B with at least five entries and sources; compare the sources in B2; show the time gap with units in B3.

5

WRITE

Write one open question for the scene walk in Part C and explain in 3 to 5 sentences why today's documents cannot answer it.

6

WRITE

Finish Parts D and E, then hand in the paper sheet or submit one PDF to your section's assignment.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk3 D04 · The Case Opens (PLTW 1.1.1)**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D04
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 10 · Investigation Day 4 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that evidence you cannot account for is evidence you do not have.

When a real death investigation opens, the medical examiner keeps two questions separate: what physically stopped the body (the cause) and how it came about, whether natural, accident, or something worse (the manner). Mixing them up is the number one rookie mistake. Today you open the case and start the timeline and the suspect board exactly as a real cold-case unit would, with question marks, not verdicts.

OBJECTIVE

Today you will hear the dispatch call, meet the victim on paper, learn manner versus cause of death, and open the two organizers that will run the whole unit: the timeline and the suspect matrix.

Take-home (the ten-year idea): Cause is what stopped the body. Manner is the story of how it came to happen. They are different questions with different evidence.

CASE FILE UPDATE

SEC 01

The case opens. Monday 7:40 AM, a 911 call from Statik Sound recording studio: a business partner arriving to open the studio found Marcus Bell, 34, on the floor behind the mixing console, cold. First documents arrive today.

COLD OPEN: PLAY THE 911 CALL

AUD

Open the case by playing the dispatch recording before anything else: `exhibits/audio/911-call-STATIC.m4a` (about 52 seconds, SIMULATED). The verbatim transcript is Document DOC-1 in the case-document set.

Every death investigation answers two questions, and mixing them up is the number one rookie error. **CAUSE** of death is the physical event: the heart stopped from blood loss, the brain was injured, an infection overwhelmed the lungs. **MANNER** of death is the category of circumstance: natural, accident, homicide, suicide, or undetermined. Analogy: when a machine breaks, the mechanic reports what broke (cause) and the incident report says how it came to break: wear and tear, operator mistake, or sabotage (manner). **LIMIT**: bodies are not machines; disease and injury can stack, and one can hide the other. That is why undetermined is an honest verdict, not a failure.

Today you get the first documents of the case file: the dispatch transcript and the victim background card. Documents are evidence too, and they get the same discipline as a bloodstain: what does this page actually **SAY** (observation) versus what am I **ADDING** to it (inference)?

Two organizers open today and stay open for fifteen days. The **MASTER TIMELINE** holds every time-stamped fact with its source; when timelines from different sources agree, that is corroboration, and when they conflict, that is a lead. The **SUSPECT MATRIX** holds motive, means, and opportunity for each person of interest, but read the column headers: evidence **FOR** and evidence **AGAINST**. A motive with no evidence is just gossip with a nametag.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
cause of death	the physical event that stopped life	what broke the machine
manner of death	the category of how it came about: natural, accident, homicide, suicide, or undetermined	the story behind the breakdown
dispatch	the emergency call record that starts a case clock	the opening whistle

YOUR ROLE

You are the first analysts on a fresh case.

THE SITUATION

You have exactly two documents: the dispatch transcript and the victim background card. The room will be full of theories in four minutes.

THE RULE YOU APPLY

Separate what the documents state from what you are assuming. Every timeline entry needs a source column filled.

WHAT YOU PRODUCE

Initial observations log: ten entries minimum, each labeled O or I, plus the first timeline entries with sources.

Claim ceiling. You may not name a cause, a manner, or a suspect today. You have two pieces of paper. The matrix opens with question marks, not verdicts.

WHAT THIS UNLOCKS

Tomorrow you walk the scene.

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

Hand out only the exhibits listed for this day.

EXHIBIT 001 · Records thread

GIVEN AT CASE OPEN

Person of interest: Terrence Cole (business partner)



Person of interest: Rina Vasquez (rival studio owner)



Persons of interest: Deshawn Okoye and Louise Tran



INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Prep the scene-walk plan for tomorrow: photo order, sketch duties.

B Trace

List what trace evidence the background card hints you might find.

C Serology and DNA

List what serology or DNA questions the documents raise.

D Toxicology and Chemistry

List what chemistry questions the documents raise.

E Medical Examiner

Start the victim profile margin on the body diagram page: age, known health notes from the card only.

F Records and Timeline

Own the master timeline; enter the 911 call time (7:40 AM Monday) and every time stamp in the documents.
Note what the DM printout does NOT show: send dates.

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Master timeline spread (opens today)
- Suspect matrix (opens today)
- Day 4 Cornell page

DAILY SUBMISSION FORM: INITIAL OBSERVATIONS LOG

JH-26-0831-A / D4

- ☐ Ten entries labeled O / I
- ☐ First timeline entries with source column
- ☐ One open question for tomorrow's scene walk

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D04-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 10 · Investigation Day 4 of 18 · The Case Opens

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOME 5.8

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 10, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

When a real death investigation opens, the medical examiner keeps two questions separate: what physically stopped the body (the cause) and how it came about, whether natural, accident, or something worse (the manner). Mixing them up is the number one rookie mistake. Today you open the case and start the timeline and the suspect board exactly as a real cold-case unit would, with question marks, not verdicts.

Today you will: hear the **dispatch** call, meet the victim on paper, learn manner versus **cause of death**, and open the two organizers that will run the whole unit: the timeline and the suspect matrix.

The ten-year idea: Cause is what stopped the body. Manner is the story of how it came to happen. They are different questions with different evidence.

CAUSE OF DEATH: the physical event that stopped life. Analogy to hold onto: what broke the machine.

MANNER OF DEATH: the category of how it came about: natural, accident, homicide, suicide, or undetermined. Analogy to hold onto: the story behind the breakdown.

DISPATCH: the emergency call record that starts a case clock. Analogy to hold onto: the opening whistle.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Every death investigation answers two questions, and mixing them up is the number one rookie error. **CAUSE of death** is the physical event: the heart stopped from blood loss, the brain was injured, an infection overwhelmed the lungs. **MANNER of death** is the category of circumstance: natural, accident, homicide, suicide, or undetermined. Analogy: when a machine breaks, the mechanic reports what broke (cause) and the incident report

says how it came to break: wear and tear, operator mistake, or sabotage (manner). LIMIT: bodies are not machines; disease and injury can stack, and one can hide the other. That is why undetermined is an honest verdict, not a failure.

Today you get the first documents of the case file: the **dispatch** transcript and the victim background card. Documents are evidence too, and they get the same discipline as a bloodstain: what does this page actually SAY (observation) versus what am I ADDING to it (inference)?

Two organizers open today and stay open for fifteen days. The MASTER TIMELINE holds every time-stamped fact with its source; when timelines from different sources agree, that is corroboration, and when they conflict, that is a lead. The SUSPECT MATRIX holds motive, means, and opportunity for each person of interest, but read the column headers: evidence FOR and evidence AGAINST. A motive with no evidence is just gossip with a nametag.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D04-A1

In your own words, what is the difference between the cause of death and the manner of death? Copy the first three words of the sentence you used.

PBS-U1-
D04-A2

The reading says undetermined is an honest verdict, not a failure. Why?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Building timeline rows from a practice dispatch call

Practice case, not ours: a bicycle shop's burglar alarm goes off overnight and the keyholder calls it in; here is how you turn that call into timeline rows.



What to notice: Notice there are two separate pieces of paper: a timeline row is only as strong as the document you can point to for it.

1. Read the call record for clock stamps first. The operator's stamp says: time of this call is 2:38 AM. Row 1: 2:38 AM, call placed, source DOC-1, O (the document states it).
2. Read for events the caller states with no clock. The caller says: the alarm company texted me and I drove over, the back window is broken, nothing looks moved. Row 2: none, back window broken, DOC-1, O. Row 3: none, nothing looks moved, DOC-1, O (it is what he said, even though it is his impression).
3. Now add what a second document states. The alarm company's log says the alarm tripped at 2:05 AM. Row 4: 2:05 AM, alarm tripped, alarm log, O.
4. Add the row you had to compute, and label it I. The caller says he arrived about six minutes before calling. 2:38 minus 6 minutes = 2:32 AM. Row 5: 2:32 AM, keyholder arrives, DOC-1 plus arithmetic, I (you added the subtraction).
5. Look for an overlap. The caller says the alarm company texted him; the alarm log shows a trip at 2:05. The two sources agree that an alarm happened, so that is corroboration. If the log had shown no trip, that would be a conflict and a lead.
6. Report the gap two ways. Arrival to call: 2:38 minus 2:32 = 6 minutes. 6 minutes divided by 60 minutes per hour = 0.1 hours.

Finished product: Five rows, every one with a source, four labeled O and one labeled I; the alarm is corroborated by two sources; the arrival-to-call gap is 6 minutes, or 0.1 hours.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The case opened. The class heard the dispatch transcript (DOC-1) read aloud, then received the victim background card and the persons-of-interest brief (DOC-3). Teams opened the master timeline and the suspect matrix. These are the facts a team pulled from the two documents the sheet allows, with the source for each.

TIME (OR NONE)	EVENT, IN THE DOCUMENT'S OWN WORDS	SOURCE	O OR I
7:40 AM Monday	Time of this call is 7:40 AM, Monday (operator's stamp)	DOC-1	O
none (caller says about two minutes before the call)	I badged in like two minutes ago to open up	DOC-1	O
7:38 AM Monday	Caller's badge-in time, computed as 7:40 minus 2 minutes	DOC-1 plus arithmetic	I
none	The door was locked like normal	DOC-1	O
none	He's behind the console. The big speaker cabinet is down, it's on his legs, there's a blanket	DOC-1	O
none	He's cold. He's been here a while, I think (the caller's guess, recorded as something he said)	DOC-1	O
none	Childhood diagnosis of type 1 diabetes on early records; no current physician; last insulin fill lapsed and was never renewed (RECORDS)	background card	O
none (past several weeks)	Two clients said he seemed run down, drank energy drinks constantly, lost weight, was thirsty all the time (SECONDHAND statements)	background card	O
Friday to Monday, routine	Routinely locked himself in for weekend mixing marathons, alone, phone off	background card	O
two weeks before	Refused a buyout offer from his business partner	background card	O

Overlap for B2	DOC-1: the door was locked like normal. Background card: he routinely locked himself in for weekend sessions alone. The two documents AGREE on a locked studio, which is corroboration (two independent sources saying the same thing). A conflict would have been a lead to chase, not a verdict.
Numbers for B3	Call time 7:40 AM. Caller says he badged in about 2 minutes earlier. Arrival = 7:38 AM. Gap = 2 minutes. 2 minutes divided by 60 minutes per hour = 0.03 hours (rounded).
Suspect matrix after today (F team)	Four names: Terrence Cole, Rina Vasquez, Deshawn Okoye, Louise Tran. Motives in the CLAIMED column only. Evidence-for and evidence-against columns empty.
Open question the room posted for the scene walk	What is under the cabinet and the blanket, and what does the floor around the console show? (Nobody may name a cause, a manner, or a suspect yet.)

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

You have exactly two documents today: the dispatch transcript (Document DOC-1) and the victim background card. Every entry below must come from one of them, with the source written down.

TIME STAMP: a clock time attached to an event. If the document gives no clock time, write none.

SOURCE: the document a fact came from. A fact with no source is a rumor.

CORROBORATION: two independent sources that agree. It is the strongest thing a timeline can show.

TIME (OR NONE)	EVENT, IN THE DOCUMENT'S OWN WORDS	SOURCE (DOC-1 OR BACKGROUND CARD)	O OR I

PBS-U1-D04-B1

☐

Timeline table: at least five entries, every one with a source, every one labeled O (the document states it) or I (you added it). (Scored on the table.)

PBS-U1-D04-B2

☐

Find one place where the two documents talk about the same thing. Do they agree or conflict? Write which, and what a conflict would mean for the investigation.

PBS-U1-D04-B3

☐

DOC-1 prints the time of the call. The caller says they arrived shortly before calling; use the minutes given by the caller (Case A: DOC-1) or by the first interview card (Case B: the shift lead, DOC-3). Write the arrival time, then the gap between arrival and the call in minutes and as a decimal fraction of an hour (divide by 60). Show the work with units.

PART C · WRITE THE CALL

SEC 03

Write the one open question tomorrow's scene walk must answer. Then explain in three to five sentences why the two documents you hold today cannot answer it. Use at least one observation (O) and one inference (I) from your table, and label each one.

Claim ceiling. You may not name a cause, a manner, or a suspect today. You have two pieces of paper. The matrix opens with question marks, not verdicts.

PBS-U1-
D04-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D04-D1

☐

Use **cause of death** and **manner of death** and **dispatch** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D04-E1

☐

The heart stopped from blood loss. Cause or manner?

PBS-U1-
D04-E2

☐

The five manners of death?

PBS-U1-
D04-E3

☐

A suspect has a strong motive and nothing else. What does the matrix say?

TURN IN

SLIP

Initial observations log: Ten entries labeled O / I; First timeline entries with source column; One open question for tomorrow's scene walk.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	5.8.4	Establish and implement procedures for systematic collection, organization and use of data.
Ohio Health Science	5.8.7	Document results of the experiment in a laboratory notebook, adhering to professional protocol.
Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	1.2.1	Extract relevant, valid information from materials and cite sources of information (e.g., medical reports, fitness assessment, medical test results).
Ohio Health Science	1.3.3	Use ethical character traits consistent with workplace standards (e.g., honesty, personal integrity, compassion, justice).
PLTW PBS framework	EXD-A.4	Maintain a detailed repeatable account of an experiment in a physical or digital laboratory notebook.
PLTW PBS framework	COM-A.7	Use appropriate scientific terminology and abbreviations.
Common Core	RST.9-10.1	Cite specific textual evidence to support analysis of science and technical texts, noting the precise details of explanations or descriptions.
Common Core	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation of a complex process; summarize accurately.
Common Core	WHST.9-10.2	Write informative or explanatory texts, including scientific procedures and technical processes, with precise language and domain-specific vocabulary.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-8	Obtaining, evaluating, and communicating information: read scientific texts to summarize and evaluate claims and evidence.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do4-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.04a	Tell cause of death from manner of death and name the five manners	items A1, A2, E1, E2
PBS.S.04b	Build a timeline entry: time, event, and the source document it came from	items B1, B2
PBS.S.04c	Compute elapsed time and report it in two units	items B3
PBS.S.04d	Separate observation from inference and write the open question the evidence must answer	items C1, D1, E3

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 14 OF 28 Thu, Sep 10 about 80 minutes**Investigation Day 5: Walk the Scene**

Today we need to accomplish make a scaled practice sketch, evaluate five labeled photo frames and complete the whole D05 evidence sheet.

Our goal is explain forensic documentation steps and chain of custody, then complete the PLTW scene task online.

You have to turn in Exit ticket: write the four documentation steps in correct sequence and list three required fields in a chain-of-custody record. Hand in your exit ticket before leaving class.

Schoology assignment: Wk3 D05 · Walk the Scene (PLTW 1.1.1)

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D05 Case A briefing pack (read this)** (4 pages); then **D05 Case A Daily Evidence Sheet (write on this)** (8 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

Take notes on the order of scene documentation: photograph, sketch, log, collect.

3

WRITE

Define chain of custody and list what each transfer record must capture.

HINT Record what is supplied. Mark what is missing. Keep practice separate from case facts.

4

CHECK

Review what makes an evidence log admissible vs. compromised.

5

WRITE

Complete the PLTW investigating-the-scene online task and evidence-log entry.

6

DO

Identify the independent variable and controls in a controlled collection method.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk3 D05 · Walk the Scene (PLTW 1.1.1)**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D05
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

ORIGINAL CLASSROOM SIMULATION

DAILY INVESTIGATION PACKET

Sep 11 · Investigation Day 5 of 18

CLASSROOM SIMULATION

FRIDAY ROUTE: ONE D05 PACKET

For September 11, use [Documentation Practice](#) for B1, B2, the scene sketch and the photo records. Complete the whole D05 sheet. Keep B3 and tasks A, C, D and E. The supplement replaces the older sample measurements and five photo answers for this lesson. This is original John Hay paper-scene practice; no scene staging, touching or collection is required.

Turn in one completed D05 packet: the whole evidence sheet, your PLAN-1 sketch and four measurement rows, five photo-log rows and five judgments. Include the supplement's completed pages once. Keep the listed notebook work in your notebook. Hand in paper or submit one PDF through [PBS1282 Walk the Scene](#).

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from The Case Opens: keep a source beside every statement and an open question beside each gap. Today document the supplied practice while keeping case observations separate.

Real crime scene investigators photograph a scene wide, then closer, then close-up with a ruler in the frame, and they sketch it with measurements, all before touching a single thing, because you only ever get one untouched scene. Today you document this scene the same disciplined way, so nothing is lost before it is recorded.

Objective: make a scaled practice sketch, evaluate five labeled photo frames and complete the whole D05 evidence sheet.

Take-home (the ten-year idea): Document first, touch second. You get exactly one untouched scene.

CASE FILE UPDATE

SEC 01

Scene access granted. The studio: mixing console, the fallen speaker cabinet across the victim's legs, an acoustic moving blanket half-covering the lower body. Document everything; touch nothing.



A crime scene is a one-time download. The moment anyone moves anything, the original arrangement is gone forever, so the entire first pass is capture, not collection. Analogy: save the game before you fight the boss. LIMIT: in real life there is no reload; the save file IS the case, which is why the documentation standard is brutal.

Photography runs wide, mid, close: the WIDE shot places the scene in the room, the MID shot places the item in the scene, the CLOSE shot shows the item with a scale marker, because a photo without scale cannot testify to size. Every photo enters the log: number, subject, direction faced.

Two-point measurement records a distance from each fixed reference point. You also need their separation and the correct side of the line between them. PLAN-1 supplies both. All four points are north of that line.

Tagging: each item gets a number tent beside it, entered in the evidence log with location and description. The custody row opens only when an item is bagged, and nothing is bagged today unless released. Nothing is bagged today unless the teacher-investigator releases it; capture beats collection on day one at a scene.

Check your record before adding a number or a claim. PLAN-1 supplies the geometry. The captions identify the photo frames. If a size, direction or history is not supplied, mark the gap. Use that decision in the existing B2 and photo-log work; do not create a second response.

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

This original practice supports documentation skills connected to Activity 1.1.1. Official PLTW work remains separate; use your section's linked Schoology directions for that work. This packet does not record official activity completion.

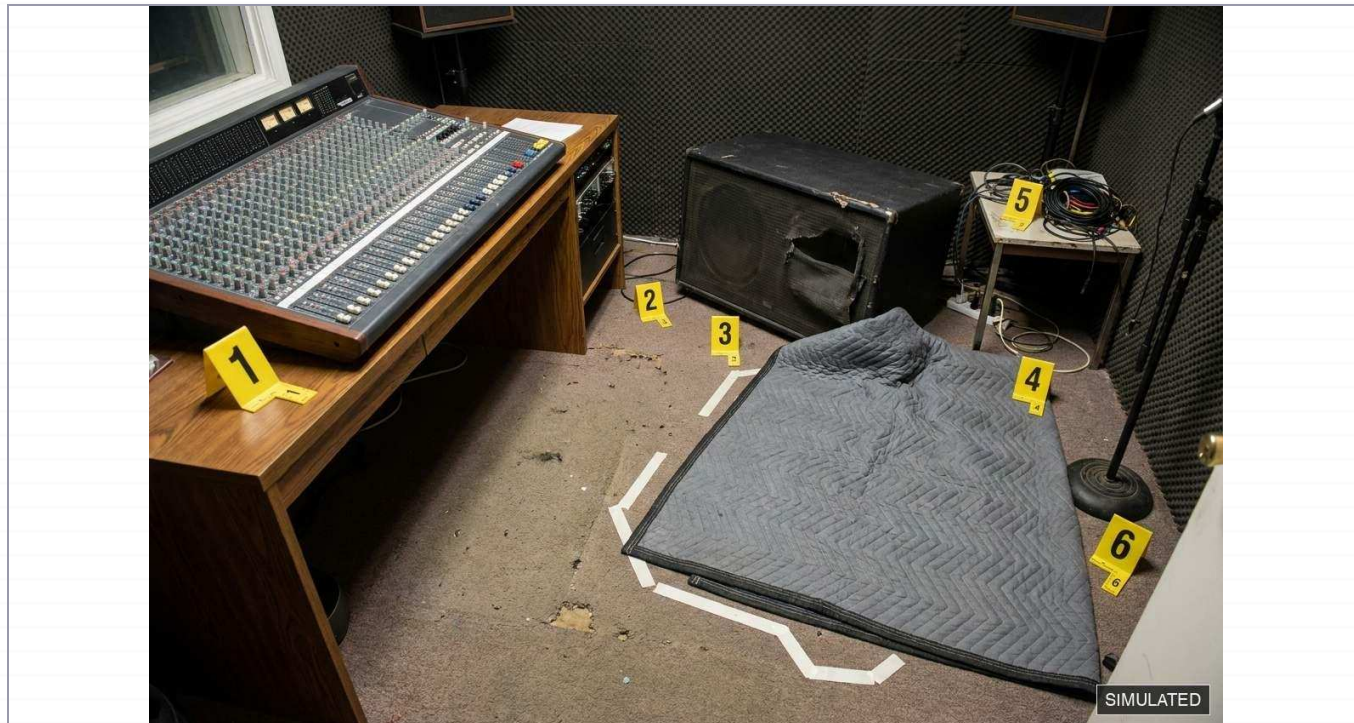


Hand out only the exhibits listed for this day. Everything marked RELEASED DAY N stays restricted until then.

EXHIBIT 004 · Scene thread

RELEASED DAY 5

Scene, wide shot: studio floor behind the mixing console



DOCUMENTATION METHOD AND FRIDAY PAPER PRACTICE

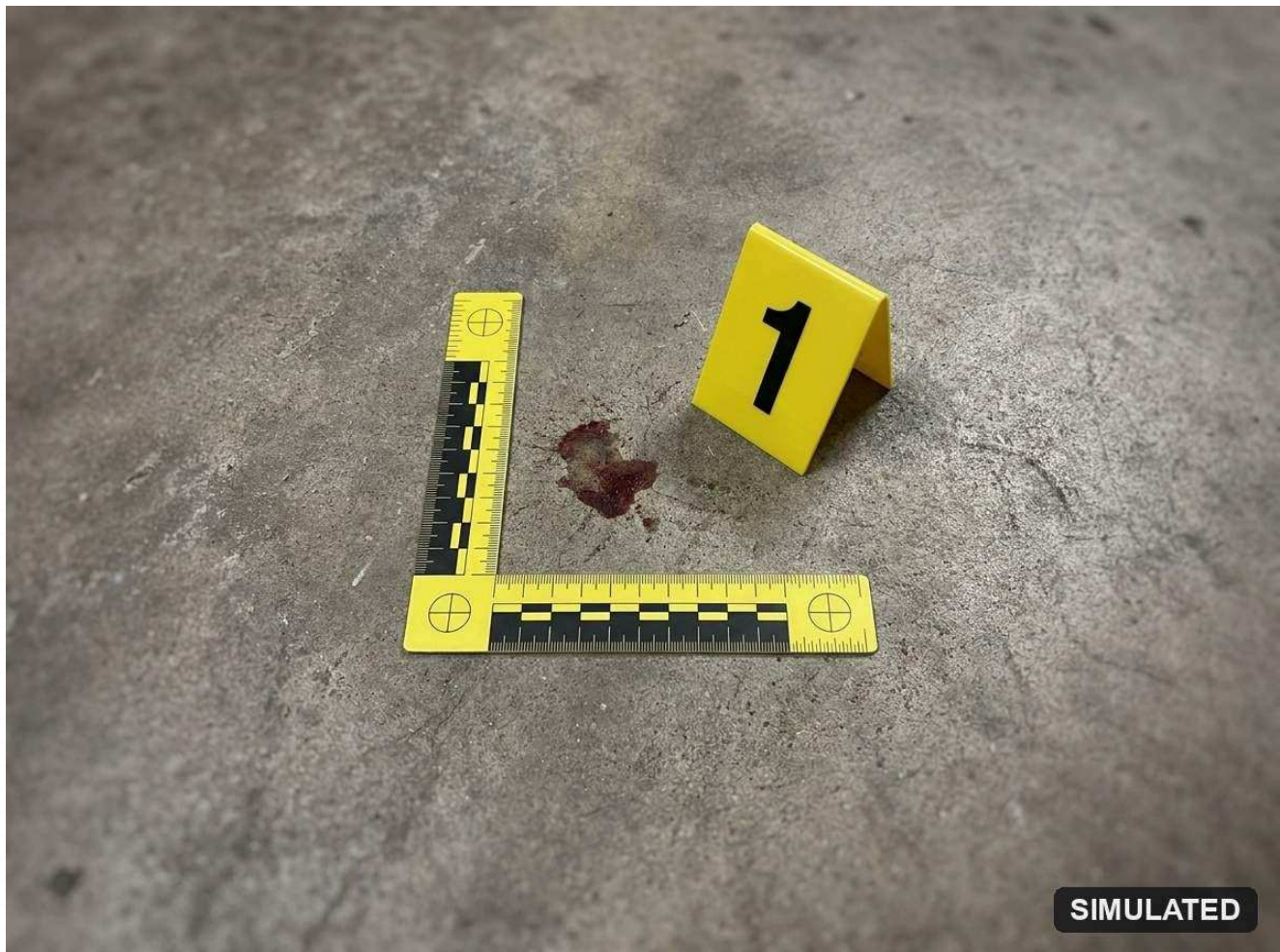
SEC 08

Today uses paper and the supplied frames. Do not handle or collect case materials. For any later physical scene, follow the teacher's safety instructions and document the original arrangement before collection.

1. Read PLAN-1 and label the sketch with north, scale and both fixed reference points.
2. Locate P1 to P4 and record both distances with units. Use the supplied side of the baseline.
3. Read each photo caption and purpose. A digital crop is not a new camera view.
4. Log visible features and missing information. Judge the five frames with a reason and improvement or limit.

The illustration below is simulated. It teaches documentation features; it supplies no numerical dimensions or case findings.





INVESTIGATION TEAM ASSIGNMENTS

SEC 05

Work independently or compare with your assigned group. Everyone completes the same DO5 packet. First finish Part A, then the PLAN-1 sketch and B1/B3, the five photo records and B2, and Parts C, D and E. Use your own case image for C1. Keep the listed notebook work in your notebook. No scene staging, collection or second team product is required.

NOTEBOOK PAGES IN USE TODAY

SEC 06

- PLAN-1 sketch: include it once in your DO5 packet
- Observation vs inference Venn
- Day 5 Cornell page

Turn in one completed DO5 packet: the whole evidence sheet, your PLAN-1 sketch and four measurement rows, five photo-log rows and five judgments. Include the supplement's completed pages once. Keep the listed notebook work in your notebook. Hand in paper or submit one PDF through [PBS1282 Walk the Scene](#).





OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D05-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

ORIGINAL CLASSROOM SIMULATION

DAILY EVIDENCE SHEET

Sep 11 · Investigation Day 5 of 18 · Walk the Scene

CLASSROOM SIMULATION

WEBXAM · DOMAIN 1 HANDLING, PREPARATION, STORAGE AND DISPOSAL · OHIO OUTCOME 5.9

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 11, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

For September 11, use [Documentation Practice](#) for B1, B2, the scene sketch and the photo records. Complete the whole D05 sheet. Keep B3 and tasks A, C, D and E. The supplement replaces the older sample measurements and five photo answers for this lesson. This is original John Hay paper-scene practice; no scene staging, touching or collection is required.

Real crime scene investigators photograph a scene wide, then closer, then close-up with a ruler in the frame, and they sketch it with measurements, all before touching a single thing, because you only ever get one untouched scene. Today you document this scene the same disciplined way, so nothing is lost before it is recorded.

Today you will: document the scene the way professionals do: photograph wide to close with scales, sketch with two-point measurements, and tag without touching.

The ten-year idea: Document first, touch second. You get exactly one untouched scene.

SCALE MARKER: a ruler or L-shaped card placed in a photo so the picture can show true size. Analogy to hold onto: the person standing next to the fish.

REFERENCE POINT: a fixed spot in the room, like a doorframe corner, that every measurement starts from. Analogy to hold onto: home plate.



A crime scene is a one-time download. The moment anyone moves anything, the original arrangement is gone forever, so the entire first pass is capture, not collection. Analogy: save the game before you fight the boss. LIMIT: in real life there is no reload; the save file IS the case, which is why the documentation standard is brutal.

Photography runs wide, mid, close: the WIDE shot places the scene in the room, the MID shot places the item in the scene, the CLOSE shot shows the item with a **scale marker**, because a photo without scale cannot testify to size. Every photo enters the log: number, subject, direction faced.

Two-point measurement records a distance from each fixed reference point. You also need their separation and the correct side of the line between them. PLAN-1 supplies both. All four points are north of that line.

Tagging: each item gets a number tent beside it, entered in the evidence log with location and description. The custody row opens only when an item is bagged, and nothing is bagged today unless released. Nothing is bagged today unless the teacher-investigator releases it; capture beats collection on day one at a scene.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D05-A1

The reading says a photo without scale cannot testify to size. What does a scale marker let a photo prove? Copy the first three words of the sentence you used.

PBS-U1-
D05-A2

The reading calls the first pass capture, not collection. In your own words, what is the difference, and why does the order matter?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Locating one item with two measurements and drawing it to scale

Practice scene, not ours: a backpack dropped in a school hallway after a locker break-in; you have a tape, a sketch pad, and a camera.





What to notice: Notice the tape runs from a fixed doorframe corner, not from a chair or a cart that could be moved tomorrow.

1. Pick two fixed reference points that will still be there next year. RP1 = the doorframe corner of room 114. RP2 = the end of the locker bank. Write both at the top of the sketch.
2. Photograph before you measure: WIDE (the hallway with the backpack in it), MID (the backpack and the nearest locker), CLOSE (the backpack strap with the L-shaped scale marker in the frame). Log each: photo 1 wide facing north, photo 2 mid facing north, photo 3 close facing down.
3. Measure from RP1 to the nearest edge of the backpack with the tape held level: 240 cm. Measure from RP2 to the same edge: 155 cm. Both numbers get the unit written next to them.
4. Convert each to the sketch scale of 1 cm on paper = 20 cm in the room. 240 cm divided by 20 cm per drawn cm = 12 cm on paper from RP1. 155 cm divided by 20 cm per drawn cm = 7.75 cm on paper from RP2, drawn as 7.8 cm.
5. Place it: set a compass to 12 cm and swing an arc from RP1 on the sketch; set it to 7.8 cm and swing an arc from RP2. The backpack goes where the two arcs cross. One arc alone would only draw a circle of maybe.
6. State the precision. The room tape reads to the nearest millimeter (0.1 cm), so 240 cm really means 240.0 cm. On paper at this scale, 0.1 cm in the room is far too small to draw, so the sketch's precision is limited by the pencil, about 0.1 cm on paper, which stands for 2 cm in the room.

Finished product: The backpack sits 240 cm from the doorframe corner and 155 cm from the locker-bank end, which is 12 cm and 7.8 cm on a 1:20 sketch; the two arcs pin one spot, and the tape's millimeter precision is finer than the sketch can show.

Now use PLAN-1 and the five labeled frames in the supplement for your Part B work. Do not copy the older example as your case data.



Model limit: The scalar conversions above show a method. Without the separation of the two reference points and the correct side of their baseline, those two arcs do not supply a unique layout. Use PLAN-1 for the required sketch; it supplies the coordinates, reference-point separation and north side. The described backpack photo history is a fictional worked example, not a history of PHOTO-4.

FRIDAY PRACTICE INPUTS AND CASE BOUNDARIES

SEC 01B

Measurement input: PLAN-1, supplement page 1. It is an original mathematical training area, not the room in either case. Record P1 to P4 using its named reference points.

Photo input: PHOTO-1 to PHOTO-5, supplement pages 3 and 4. These are labeled training frames and illustrations, not five recovered photographs. They establish no new case facts.

Use only your own section's image and supplied case records for Part C. Mark this work as original simulation practice.

ABSENT OR NEW TO THE CLASS? START HERE

Body position from the tape line (Team E)	Prone (face down), slightly on the right side, head toward the console corner, lower body beneath the cabinet and the blanket. What cannot be seen: the legs and anything under the blanket. Written on the sketch margin as cannot see, not as absent.
Numbers for B3	Sketch scale 1 cm on paper = 20 cm in the room. Example item at 180 cm from RP1. Divide and keep units. Given training precision: the example tape reads to the nearest millimeter (0.1 cm). This is not a claim about an inspected classroom tape.
Claim ceiling reminder	The mark at the console corner is a reddish-brown stain in every log line today. No word stronger than stain.

PART B · WORK THE EVIDENCE

SEC 02

Use PLAN-1. The diagram names both fixed reference points and shows their separation. Add P1 to P4 to the blank sketch. Label both distances for each point, with centimeters. Complete the four measurement rows on supplement page 2. Write "See PLAN-1 page" in this B1 space so you do not copy the table twice. Copy the supplied RP1 and RP2 distances into your record. Use them to plot and check your sketch; these are simulated values, not measurements you collected.

Two-point measurement records a distance from each fixed reference point. You also need their separation and the correct side of the line between them. PLAN-1 supplies both. All four points are north of that line.



B1 uses supplement page 2. Write: See PLAN-1 page.

PBS-U1-
D05-B1

☐

Check your PLAN-1 page: RP1 and RP2 named; P1 to P4 placed; two distances with units for each; photo-set status recorded truthfully. No PLAN-1 photographs are supplied. Do not invent photo numbers. The five training frames have their own log.

PBS-U1-
D05-B2

☐

Complete one log row and one judgment for each PHOTO-1 to PHOTO-5 in the supplement. Judge its stated purpose: useful, not useful, or not enough information. Give a visible reason and an improvement or limit. Here, explain the frame your group debated most. If working alone, choose the hardest judgment.

PBS-U1-
D05-B3

☐

Your sketch is drawn at a scale of 1 centimeter on paper to 20 centimeters in the room. An item measured 180 centimeters from reference point 1. How many centimeters from that point do you draw it? Show the division with units. Then say how precise the room tape lets you be (to the nearest what on the tape?).

PART C · WRITE THE CALL

SEC 03

Use your own Case A image and records for C1. PLAN-1 is a measurement exercise. The shared scale/backpack illustrations are documentation examples. They add no facts about your case.

Write the first-impressions entry for today's scene as it will appear in the record. Give three observations (what the camera would also see). Then, in a separate second paragraph, give two inferences you are tempted to make. Label each one I, and follow each with the test or measurement that would be needed before it could become a finding.

Claim ceiling. You may document what is present. You may not yet say what any stain or item IS; a reddish-brown stain is a reddish-brown stain until a test says more.



PBS-U1-
D05-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D05-D1

☐

Use **scale marker** and **reference point** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D05-E1

☐

Why does a close-up need a scale marker?

PBS-U1-
D05-E2

☐

Why two measurements per item on the sketch?

PBS-U1-
D05-E3

☐

You see a reddish-brown stain. What may you call it today?

TURN IN

SLIP

Turn in one completed D05 packet: the whole evidence sheet, your PLAN-1 sketch and four measurement rows, five photo-log rows and five judgments. Include the supplement's completed pages once. Keep the listed notebook



work in your notebook. Hand in paper or submit one PDF through [PBS1282 Walk the Scene](#).

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Handling, Preparation, Storage and Disposal (53.93 percent of the test), Ohio outcome 5.9 Clinical Laboratory Techniques and Procedures.

Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	5.8.4	Establish and implement procedures for systematic collection, organization and use of data.
Ohio Health Science	5.8.7	Document results of the experiment in a laboratory notebook, adhering to professional protocol.
Ohio Health Science	5.8.10	Create, interpret, and use tabular and graphical displays and describe the data.
Ohio Health Science	1.2.12	Use technical writing skills to complete forms and create reports.
PLTW PBS framework	EXD-A.4	Maintain a detailed repeatable account of an experiment in a physical or digital laboratory notebook.
PLTW PBS framework	EXD-B.2	Display data appropriately and accurately in digital or written form (graphs, tables, diagrams).
PLTW PBS framework	GLP-B.1	Use and apply principles of measurement.
Common Core	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation of a complex process; summarize accurately.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	WHST.9-10.2	Write informative or explanatory texts, including scientific procedures and technical processes, with precise language and domain-specific vocabulary.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
Common Core	HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
NGSS	SEP-8	Obtaining, evaluating, and communicating information: read scientific texts to summarize and evaluate claims and evidence.



How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D05-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.05a	Explain why a photo needs wide, mid, and close shots and a scale marker	items A1, E1
PBS.S.05b	Locate an item with two measurements from fixed reference points and draw it to scale	items B1, B3, E2
PBS.S.05c	Judge whether a photo is usable and say why	items B2
PBS.S.05d	Keep observation and inference apart in a written record	items A2, C1, D1, E3

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.



ASSIGNMENT 15 OF 28 Fri, Sep 11 about 80 minutes**Investigation Day 6: Process the Scene**

Today we need to accomplish run full evidence intake with chain of custody, and sweep the scene under alternate light, where latent stains appear that plain light cannot show.

Our goal is document a mock crime scene to SOP standard and examine trace evidence under magnification with a team.

You have to turn in Team scene packet: one photo with scale marker, scaled sketch with orientation, completed evidence log, microscopy sketch at two magnifications, and one contamination risk noted. Submit the team scene packet as a shared document; each member notes their role on the cover page.

Schoology assignment: Wk3 D06 · Process the Scene

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D06 Case A briefing pack (read this)** (10 pages); then **D06 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Read the scene SOP and assign roles: photographer, sketcher, logger.

3

DO

Photograph and sketch the scene with a scale marker and orientation note.

HINT A glow is a lead, not a verdict. Presumptive means maybe.

4

DO

Collect and label trace evidence, recording each item in the evidence log.

5

DO

Examine a trace sample (fiber or hair) under magnification and describe it.

6

WRITE

Record one limitation of your documentation and one possible contamination source.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk3 D06 · Process the Scene**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 14 · Investigation Day 6 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that document first, touch second. You get exactly one untouched scene.

Real forensic teams darken a room and sweep it with an alternate light to reveal stains the eye cannot see, and they treat every glow as a 'maybe' until a lab test confirms it. Today you process the scene and run that same UV sweep, and you hold the same honest language: a glow is a lead, not a verdict.

OBJECTIVE

Today you will run full evidence intake with chain of custody, and sweep the scene under alternate light, where latent stains appear that plain light cannot show.

Take-home (the ten-year idea): A glow is a lead, not a verdict. Presumptive means maybe.

CASE FILE UPDATE

SEC 01

Full processing day. White light first, then the room goes dark: the UV sweep finds latent stains at the console corner and on the floor nearby that plain light missed.

Some evidence is **LATENT**: present but invisible until developed. Certain residues fluoresce under specific light even after a surface looks clean to the eye. Investigators use alternate light sources and presumptive reagents to find candidate stains fast. Our stand-in: a UV lamp and treated smears that respond the way a luminol-type screen responds.

Here is the discipline that separates professionals from television: a **PRESUMPTIVE** result says maybe. Several common substances can trigger screening tests: some cleaning products, certain metals, some plant materials. So the glow tells you where to sample; it never tells you what the sample is. Analogy: a metal detector on a beach beeps for treasure and for bottle caps alike; the beep tells you where to dig, not what is buried. **LIMIT**: a silent detector does not prove sand is empty either; screens can miss. Absence of a beep is not evidence of absence.

Every candidate stain found today gets the full treatment: photographed under both lights with scale, located on the sketch, swabbed or noted for collection, and entered in the master evidence log with its custody row. From today forward, exhibits carry E-numbers, and every E-number must be traceable from scene to analysis to conclusion. That thread is the case.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
latent	present but invisible until you develop or light it	invisible ink
presumptive test	a fast screening test that says maybe, never yes	a metal detector beep

YOUR ROLE

The whole unit processes; Team A runs intake, Team C runs the light sweep.

THE SITUATION

Full scene access, evidence bags, tents, the UV lamp, and one period. More candidates than time.

THE RULE YOU APPLY

Fragile and time-sensitive evidence first; everything documented before collected; every collected item gets a custody row at the moment of bagging.

WHAT YOU PRODUCE

Completed evidence intake sheets: every E-number with location, both-lights photo reference, and an opened custody row.

Claim ceiling. Glowing areas are candidate stains, fluoresced under alternate light, presumptive screen pending. The word blood does not appear in today's log.

WHAT THIS UNLOCKS

The lab phase: trace comparisons begin tomorrow.

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

Hand out only the exhibits listed for this day.

EXHIBIT 005 · Scene thread

RELEASED DAY 6

Console corner, close with scale: dried reddish-brown stain



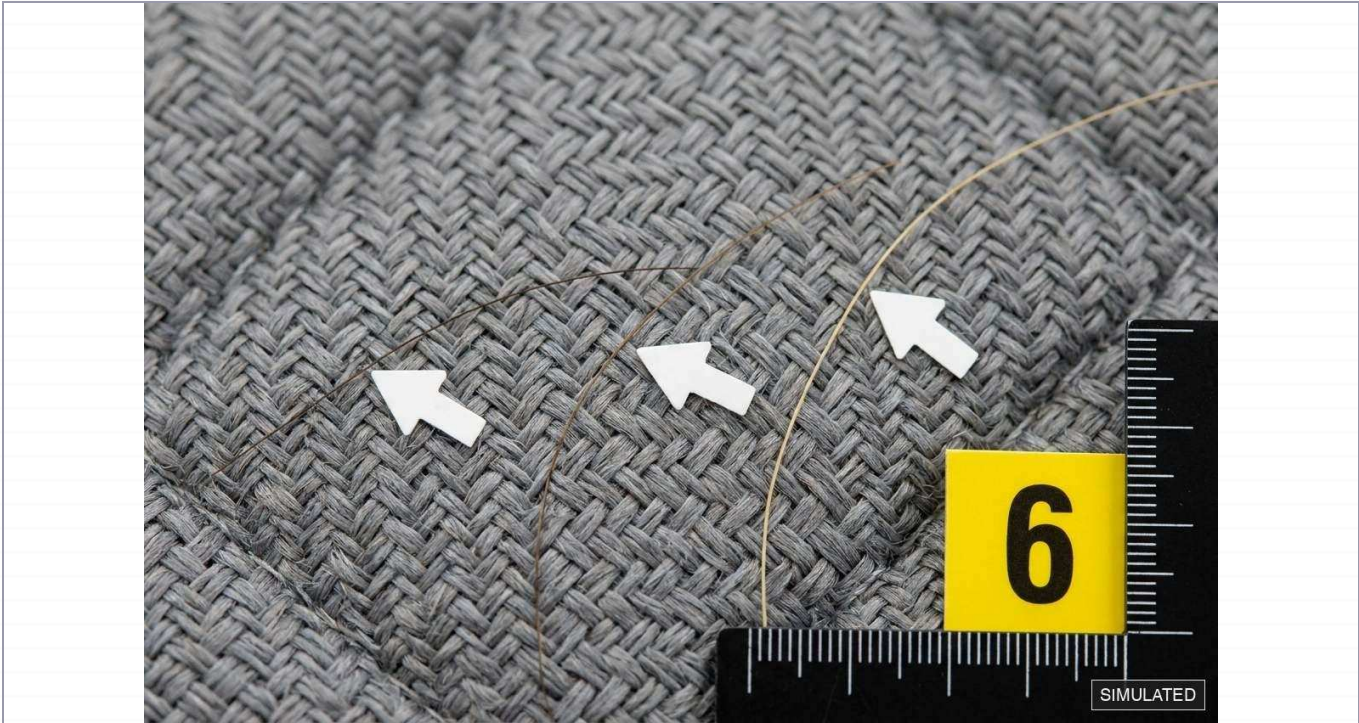
Same area under alternate (UV) light: latent stains fluorescing



Side table: three energy-drink cans



Acoustic blanket: hairs recovered (arrows)



LAB PROCEDURES FOR TODAY

SEC 08

Follow each illustrated procedure step by step. The full set is in the Lab Manual.

PROCEDURE: DOCUMENTING THE SCENE

HOW-TO



1. Before touching anything, place an L-shaped scale ruler and a numbered evidence marker beside the item.
2. Photograph in three shots: WIDE (the item in the room), MID (the item in its area), and CLOSE (the item with the scale in frame).
3. On the sketch, fix two reference points and locate the item by its distance from BOTH; one measurement only draws a circle of maybe.
4. Enter every photo in the log: number, subject, and the direction the camera faced.

Safety and honesty: Documentation is capture, not collection. Nothing is bagged until it has been photographed, sketched, and logged.

PROCEDURE: ALTERNATE-LIGHT (UV) SWEEP

HOW-TO

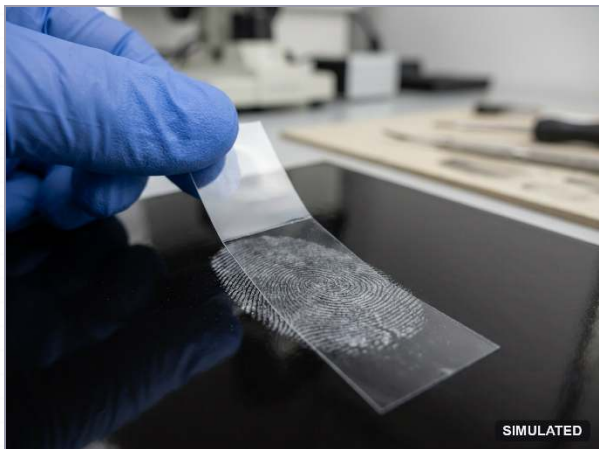


1. Darken the room completely so faint fluorescence is visible.
2. Hold the UV lamp at a low angle and sweep slowly across the surface.
3. Mark every area that fluoresces; these are CANDIDATE stains, not confirmed anything.
4. Photograph each hit under UV with a scale, then again under white light, and log its location.

Safety and honesty: Wear UV-blocking eyewear. A glow is a lead, not a verdict: the word blood never appears in the log at this step.

PROCEDURE: LIFTING A FINGERPRINT

HOW-TO



1. Photograph the latent print in place, with a scale, before any powder touches it.
2. Dust lightly with contrasting powder using a soft brush, in the direction of the ridges.
3. Press clear lifting tape smoothly over the developed print and lift in one motion.
4. Mount the tape on a card of contrasting color, then label and log it.

Safety and honesty: Gloves throughout, and a fresh brush per surface, so you never carry one surface's residue onto the next.

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Run intake and the master evidence log; nothing moves without your sheet.

B Trace

Collect visible hairs from the blanket (three), and lift prints from the console fader panel and one can.

C Serology and DNA

Run the UV sweep. Expected hits: console corner, floor smear near the outline's head end. Swab both; open custody rows E2-console and E2-floor.

D Toxicology and Chemistry

Collect the three cans and the glucose meter. Log container states: cans open and empty; meter powered off, screen intact.

E Medical Examiner

Final body-position documentation before any covering is disturbed; measurements to fixed points.

F Records and Timeline

Time-log everything; reconcile the timeline against the photo log tonight.

- Master evidence log (first full entries)
- Scene map updated with UV hits
- Day 6 Cornell page

DAILY SUBMISSION FORM: EVIDENCE INTAKE SHEETS

JH-26-0831-A / D6

- ☐ E-number list with locations
- ☐ Both-lights photo references
- ☐ Custody row opened per item

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 14 · Investigation Day 6 of 18 · Process the Scene

OFFICIAL

WEBXAM · DOMAIN 1 HANDLING, PREPARATION, STORAGE AND DISPOSAL · OHIO OUTCOME 5.9

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 14, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real forensic teams darken a room and sweep it with an alternate light to reveal stains the eye cannot see, and they treat every glow as a 'maybe' until a lab test confirms it. Today you process the scene and run that same UV sweep, and you hold the same honest language: a glow is a lead, not a verdict.

Today you will: run full evidence intake with chain of custody, and sweep the scene under alternate light, where **latent** stains appear that plain light cannot show.

The ten-year idea: A glow is a lead, not a verdict. Presumptive means maybe.

LATENT: present but invisible until you develop or light it. Analogy to hold onto: invisible ink.

PRESUMPTIVE TEST: a fast screening test that says maybe, never yes. Analogy to hold onto: a metal detector beep.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Some evidence is **LATENT**: present but invisible until developed. Certain residues fluoresce under specific light even after a surface looks clean to the eye. Investigators use alternate light sources and presumptive reagents to find candidate stains fast. Our stand-in: a UV lamp and treated smears that respond the way a luminol-type screen responds.

Here is the discipline that separates professionals from television: a **PRESUMPTIVE** result says maybe. Several common substances can trigger screening tests: some cleaning products, certain metals, some plant materials. So the glow tells you where to sample; it never tells you what the sample is. Analogy: a metal detector on a beach

beeps for treasure and for bottle caps alike; the beep tells you where to dig, not what is buried. **LIMIT:** a silent detector does not prove sand is empty either; screens can miss. Absence of a beep is not evidence of absence.

Every candidate stain found today gets the full treatment: photographed under both lights with scale, located on the sketch, swabbed or noted for collection, and entered in the master evidence log with its custody row. From today forward, exhibits carry E-numbers, and every E-number must be traceable from scene to analysis to conclusion. That thread is the case.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D06-A1

The reading says a presumptive result says maybe. Name two kinds of substances the reading says can trigger a screening test. Copy the first three words of the sentence you used.

PBS-U1-
D06-A2

What does latent mean, and what does an alternate light source do about it? Answer from the reading.

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Opening one intake entry for a candidate stain found under UV

Practice scene, not ours: a stairwell in an apartment building after a reported fight; the landing looks clean under white light.



What to notice: Notice the scale marker sits in the UV shot too: a glow with no scale cannot testify to size any more than a white-light photo can.

1. Finish white-light documentation first. The landing is photographed wide, mid, and close with a scale marker: photos W-01, W-02, W-03, direction logged. Nothing is touched.

2. Darken the stairwell and sweep the lamp at a low angle. A patch on the third step, about 6 cm across, fluoresces (glows under the lamp). Say the allowed words out loud: candidate stain, fluoresced under alternate light, presumptive screen pending.
3. Photograph the hit under UV with the scale marker (UV-01), then again under white light with the scale (W-04). Now the record shows the same spot both ways.
4. Locate it with two measurements. RP1 = the fire-door frame at the landing; RP2 = the handrail's bottom post. Tape held level: 138 cm from RP1, 96 cm from RP2, on the third step tread (the flat part of a stair step). Units written.
5. Collect it now, before anyone steps on it: swab the edge of the patch, bag it, tag it E2-step3. The custody row opens right now, at the bagging: item E2-step3, date and time (today 3:14 PM), released by the evidence officer (the team member who signs for every item), received by intake.
6. Write the full intake row: E2-step3; 138 cm from RP1, 96 cm from RP2, third step tread; photos W-04 and UV-01; collected by the evidence officer at 3:14 PM, received by intake. The word blood appears nowhere in the row.

Finished product: One complete intake row for E2-step3 with a two-point location in centimeters, both photo references, and a custody row opened at the moment of bagging, logged only as a candidate stain with a presumptive screen pending.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

Full processing day. White-light documentation finished first, then the room went dark and Team C swept the console corner and the floor with the UV lamp; two areas fluoresced (glowed under the lamp). Every collected item got an E-number and a custody row at the moment it was bagged. Reference points are the same as day 5 (RP1 doorframe corner, RP2 console-end wall junction).

E-NUMBER	LOCATION (TWO-POINT MEASUREMENT)	PHOTO REFERENCES (WHITE LIGHT, UV)	COLLECTED BY, TIME, RECEIVED BY
E2-console (swab of the console-corner candidate stain)	412 cm from RP1, 168 cm from RP2, on the console corner 71 cm above the floor	W-05 (white light with scale), UV-01	Team C evidence officer, 8:52 AM, Team A intake
E2-floor (swab of the floor candidate stain near the head end of the outline)	431 cm from RP1, 174 cm from RP2, floor	W-06, UV-02	Team C evidence officer, 8:55 AM, Team A intake
E7 (three hairs from the acoustic blanket, tagged H1, H2, H3)	486 cm from RP1, 214 cm from RP2 (blanket edge); each hair's spot marked on the blanket photo	W-12 with scale, UV-03 (blanket sweep, no additional hits)	Team B evidence officer, 9:01 AM, Team A intake
E8 (print lifts: fader panel L-1, L-2, L-3; can lift L-4)	Fader panel: 405 cm from RP1, 190 cm from RP2. Can: 356 cm from RP1, 290 cm from RP2	W-15 and W-16 with scale before powder; no UV	Team B evidence officer, 9:08 AM, Team A intake
E4 (three energy-drink cans, side table)	356 cm from RP1, 290 cm from RP2	W-10, W-11 with scale; no UV hit	Team D evidence officer, 9:12 AM, Team A intake
Glucose meter (logged; E-number assigned when its data releases)	298 cm from RP1, 402 cm from RP2, on the desk	W-14 with scale; no UV	Team D evidence officer, 9:14 AM, Team A intake

Container states logged by Team D	All three cans open and empty. Glucose meter powered off, screen intact, no visible damage.
UV sweep results (Team C)	Two hits: the console corner and a floor smear near the head end of the outline. Nowhere else in the room fluoresced. Both hits were photographed under UV with a scale, then under white light, before swabbing.
The only allowed log line for a glowing area (B2)	Candidate stain, fluoresced under alternate light, presumptive screen pending. Then the location and the photo reference.
Collection order used, with reasons (B3)	1. E2 stain swabs (a floor stain can be walked on or smeared; fragile and time-sensitive). 2. E7 hairs (a hair can lift off the blanket with one gust). 3. E8 print lifts (powder and tape work has to be done before anyone touches the panel). 4. E4 cans and the meter last (durable, sealed in place, not going anywhere). Nothing was skipped; if your team only had time for three, the cans and meter were the ones to leave for the next team.
Custody check before storage	Every bag has a row; every row has a released-by and a received-by. Six rows opened today.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Complete one intake entry per item your team collected today. Every row is the first line of that item's chain of custody, so it must be exact.

E-NUMBER: the evidence number an item gets at intake. It follows the item forever, on every photo, log, and report.

INTAKE: the moment an item is bagged, tagged, and entered in the log. The custody row opens here, not later.

E-NUMBER	LOCATION (TWO-POINT MEASUREMENT)	PHOTO REFERENCES (WHITE LIGHT, UV)	COLLECTED BY, TIME, RECEIVED BY

PBS-U1-D06-B1

Intake table complete: every E-number has a location with units, both photo references, and a full custody row. (Scored on the table.)

PBS-U1-D06-B2

A stain glowed under the lamp. Write the only honest log entry for it, in the exact words the ceiling allows.

PBS-U1-D06-B3

Your team had four candidates and time for three. List the order you collected them and give the reason for the first and the last.

PART C · WRITE THE CALL

SEC 03

Someone on the team said the word blood when the stain glowed. Write the case conference note that corrects the record. Cover four things: what the lamp showed, what a presumptive test can and cannot claim, what the log entry says instead, and which test would have to come back positive before the word can be used. Four to six sentences.

Claim ceiling. Glowing areas are candidate stains, fluoresced under alternate light, presumptive screen pending. The word blood does not appear in today's log.

PBS-U1-
D06-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D06-D1

☐

Use **latent** and **presumptive test** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D06-E1

☐

A stain glows under the lamp. Write the only honest log entry.

PBS-U1-
D06-E2

☐

Name two reasons a presumptive screen can mislead.

PBS-U1-
D06-E3



When exactly does a custody row open?

TURN IN

SLIP

Evidence intake sheets: E-number list with locations; Both-lights photo references; Custody row opened per item.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Handling, Preparation, Storage and Disposal (53.93 percent of the test), Ohio outcome 5.9 Clinical Laboratory Techniques and Procedures.

Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	5.9.3	Differentiate between aseptic and sterile procedures when collecting specimens and maintain bio-hazardous materials procedures (e.g., urine, feces, sputum, blood).
Ohio Health Science	5.1.2	Locate and use safety data sheets to prepare and interpret labels for chemicals, supplies, and to identify hazards associated with handling and storing chemical materials.
Ohio Health Science	4.3.4	Identify and use appropriate level of personal protective equipment (PPE) when encountering body fluids, potential of splashing, or respiratory droplets.
Ohio Health Science	5.8.7	Document results of the experiment in a laboratory notebook, adhering to professional protocol.
Ohio Health Science	5.3.14	Describe the uses and limitations of various lab assays (e.g., HPLC, immunoassay, drainage cell, multi aspect, latex agglutination, spectrophotometry).
Ohio Health Science	1.2.12	Use technical writing skills to complete forms and create reports.
PLTW PBS framework	EXD-A.4	Maintain a detailed repeatable account of an experiment in a physical or digital laboratory notebook.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
Common Core	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation of a complex process; summarize accurately.
Common Core	RST.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or recommendation.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do6-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.06a	Explain what a presumptive result can and cannot say	items A1, A2, B2, E1, E2
PBS.S.06b	Open a custody row at the moment of collection and complete an intake entry	items B1, E3
PBS.S.06c	Order collection by fragility and time sensitivity, and justify the order	items B3
PBS.S.06d	Write a log entry that stays inside the claim ceiling	items C1, D1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 16 OF 28 Mon, Sep 14 about 80 minutes

Investigation Day 7: The Traces We Leave

Today we need to accomplish compare hairs and fingerprints against elimination samples, and learn the difference between evidence that narrows to a group and evidence that names one person.

Our goal is analyze your trace-evidence observations with a CER and evaluate documentation limitations.

You have to turn in CER arguing what the trace evidence suggests about the scene, using the microscopy observations from last class as evidence and acknowledging at least one limitation. Upload your CER to the tracker or hand in the written copy by end of class.

Schoology assignment: Wk4 D07 · The Traces We Leave (PLTW 1.1.3)

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D07 Case A briefing pack (read this)** (8 pages); then **D07 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

CHECK

Compare your trace-evidence descriptions to reference characteristics.

3

WRITE

Write a CER: what does this trace evidence suggest about the scene?

HINT Class evidence narrows the crowd. Individual evidence names one. Know which one you are holding.

4

DO

Evaluate whether your chain-of-custody log would hold up to scrutiny.

5

WRITE

List two variables that could change trace-evidence interpretation.

6

WRITE

State one limitation of trace evidence as a sole source of proof.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk4 D07 · The Traces We Leave (PLTW 1.1.3)**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D07
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 15 · Investigation Day 7 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that a glow is a lead, not a verdict. Presumptive means maybe.

Real trace examiners compare a hair or a fingerprint by listing its features first, before they ever look at whose sample it belongs to, because looking at the name first is how you fool yourself into seeing a match. Today you compare the trace evidence the same careful way, features before names.

OBJECTIVE

Today you will compare hairs and fingerprints against elimination samples, and learn the difference between evidence that narrows to a group and evidence that names one person.

Take-home (the ten-year idea): Class evidence narrows the crowd. Individual evidence names one. Know which one you are holding.

CASE FILE UPDATE

SEC 01

The trace lab opens. Three hairs from the blanket and the lifted prints go against elimination cards from everyone with known studio access.

Everyone sheds. Hair, skin, fibers, prints: contact leaves trace. Trace analysis is comparison work: a QUESTIONED sample (from the scene, source unknown) set against KNOWN samples (from named people, called elimination or reference samples). The honest output of a comparison is consistent with, inconsistent with, or inconclusive. 'Consistent with' is not 'came from'; hold that line.

Hair under magnification has morphology: color, thickness, curl, the shaft's medulla pattern, and critically the ROOT. A hair with root tissue attached was pulled out and can carry DNA from that tissue; a naturally shed hair has a dry, club-shaped root and usually only tells class-level facts. So the root says pulled versus shed. It never says when the hair reached the scene.

Fingerprints have three big pattern families: loops, whorls, arches. Pattern family is CLASS evidence: millions of people share yours. Identity lives in MINUTIAE: ridge endings, splits, dots, whose positions map uniquely to one finger. Analogy: class evidence says 'it was a sedan'; individual evidence reads the license plate. LIMIT: a partial print or a damaged hair may never reach individual level, and saying so is a finding, not a failure.

Comparison discipline: features first, conclusion last. List matching and mismatching features BEFORE you look at whose card it is. Bias runs on shortcuts; the feature list is the guardrail.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
class evidence	narrows to a group: a shoe size, a blood type, a hair color	it was a sedan
individual evidence	narrows to one source: DNA profile, a full fingerprint	it was THIS license plate
morphology	shape and structure, the way a thing is built	silhouette identification
minutiae	the tiny ridge details that make a fingerprint individual	the serial number inside the pattern

YOUR ROLE

Team B leads; all teams run comparisons.

THE SITUATION

Scene hairs and lifted prints from your intake, against a full set of elimination cards from named individuals.

THE RULE YOU APPLY

Features before names. Class vs individual labeled on every call. Consistent-with is the strongest allowed phrase for hair; minutiae count stated for any print call.

WHAT YOU PRODUCE

Trace comparison sheet: every questioned item scored, feature lists attached, class or individual labeled.

Claim ceiling. A hair consistent with a person proves presence of a hair like theirs, not presence of the person, and never a time. Prints prove touch, not when.

WHAT THIS UNLOCKS

Tomorrow, the candidate stains face their first real test.

Activity 1.1.3 The Traces We Leave Behind (referenced by title only; all materials in this file are John Hay original work)

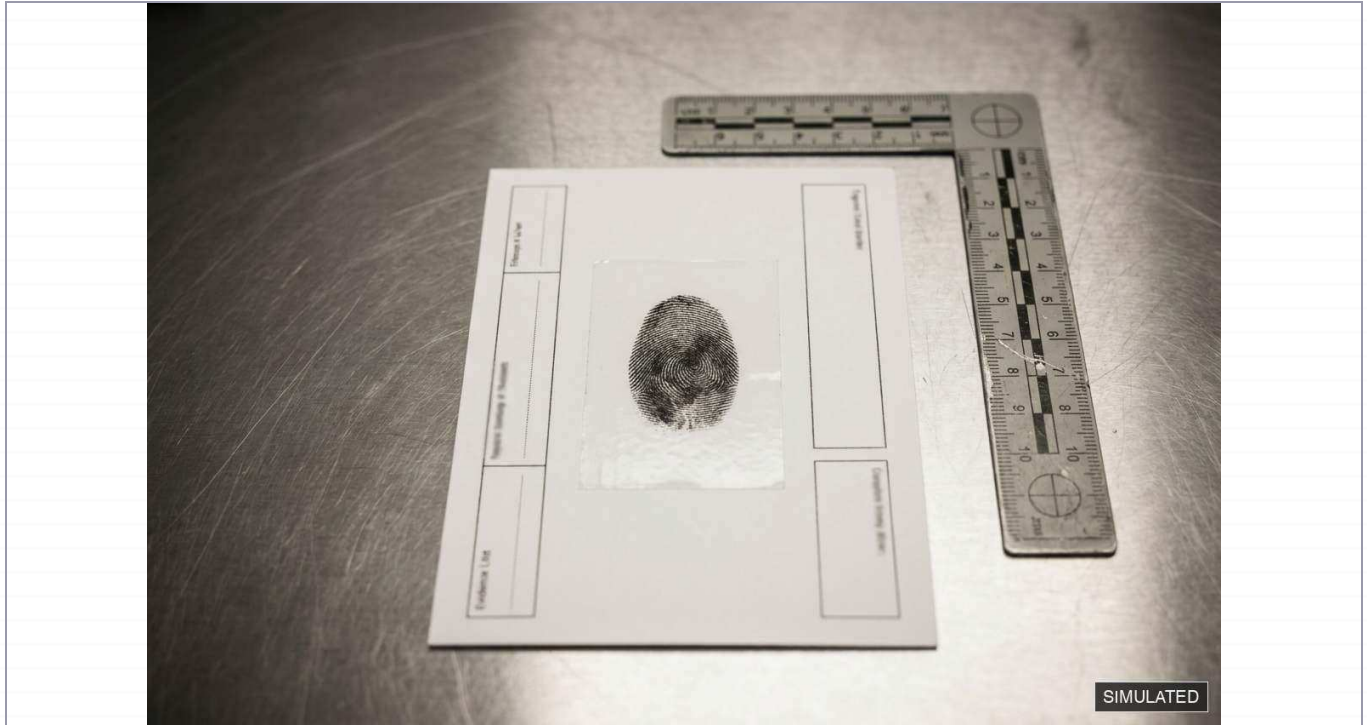
- **The Traces We Leave simulation** mendozabiomed.org/learn/lab-sim/pbs-the-traces-we-leave
- Portal: The Traces We Leave simulation (pre-lab gate), day page, guided notes

Hand out only the exhibits listed for this day.

EXHIBIT 009 · Trace thread

RELEASED DAY 7

Fingerprint lift card, console fader panel



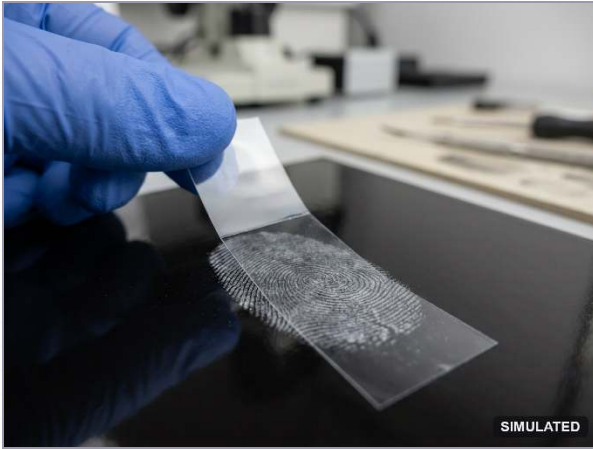


SIMULATED

SEC 08

PROCEDURE: LIFTING A FINGERPRINT

HOW-TO



1. Photograph the latent print in place, with a scale, before any powder touches it.
2. Dust lightly with contrasting powder using a soft brush, in the direction of the ridges.
3. Press clear lifting tape smoothly over the developed print and lift in one motion.
4. Mount the tape on a card of contrasting color, then label and log it.

Safety and honesty: Gloves throughout, and a fresh brush per surface, so you never carry one surface's residue onto the next.

PROCEDURE: COMPARING FINGERPRINTS

HOW-TO



1. List the features of the questioned print **FIRST**, before you look at any name: pattern family, then the ridge minutiae.
2. Count the matching minutiae between the questioned print and each elimination card.
3. Label the pattern family as **CLASS** evidence and a full minutiae match as **INDIVIDUAL** evidence.
4. State the strongest supported conclusion, and no stronger.

Safety and honesty: Features before names. Covering the names until the feature list is written is what blocks bias.

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Photograph comparison setups; update the evidence log with results references.

B Trace

Lead comparisons. Report each hair as consistent/inconsistent with a card, note root condition per hair, and label every call class or individual.

C Serology and DNA

Run the hair-root evaluation: which hairs are DNA candidates for your thread.

D Toxicology and Chemistry

Cross-check: any trace item with chemical residue notes routes to your thread.

E Medical Examiner

Log any trace findings on or near the body position onto the body diagram margins.

F Records and Timeline

Matrix entries: any exclusion is evidence-against with its E-number; any consistency is evidence-for AT CLASS LEVEL only.

- Trace comparison organizer
- Suspect matrix update
- Day 7 Cornell page

DAILY SUBMISSION FORM: TRACE COMPARISON SHEET

JH-26-0831-A / D7

- ☐ Questioned items scored with feature lists
- ☐ Class / individual label per call
- ☐ Matrix entries made, with E-numbers

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D07-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 15 · Investigation Day 7 of 18 · The Traces We Leave

OFFICIAL

WEBXAM · DOMAIN 1 HANDLING, PREPARATION, STORAGE AND DISPOSAL · OHIO OUTCOMES 5.5 AND 5.9

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 15, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real trace examiners compare a hair or a fingerprint by listing its features first, before they ever look at whose sample it belongs to, because looking at the name first is how you fool yourself into seeing a match. Today you compare the trace evidence the same careful way, features before names.

Today you will: compare hairs and fingerprints against elimination samples, and learn the difference between evidence that narrows to a group and evidence that names one person.

The ten-year idea: Class evidence narrows the crowd. Individual evidence names one. Know which one you are holding.

CLASS EVIDENCE: narrows to a group: a shoe size, a blood type, a hair color. Analogy to hold onto: it was a sedan.

INDIVIDUAL EVIDENCE: narrows to one source: DNA profile, a full fingerprint. Analogy to hold onto: it was THIS license plate.

MORPHOLOGY: shape and structure, the way a thing is built. Analogy to hold onto: silhouette identification.

MINUTIAE: the tiny ridge details that make a fingerprint individual. Analogy to hold onto: the serial number inside the pattern.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Everyone sheds. Hair, skin, fibers, prints: contact leaves trace. Trace analysis is comparison work: a QUESTIONED sample (from the scene, source unknown) set against KNOWN samples (from named people,

called elimination or reference samples). The honest output of a comparison is consistent with, inconsistent with, or inconclusive. 'Consistent with' is not 'came from'; hold that line.

Hair under magnification has **morphology**: color, thickness, curl, the shaft's medulla pattern, and critically the ROOT. A hair with root tissue attached was pulled out and can carry DNA from that tissue; a naturally shed hair has a dry, club-shaped root and usually only tells class-level facts. So the root says pulled versus shed. It never says when the hair reached the scene.

Fingerprints have three big pattern families: loops, whorls, arches. Pattern family is **CLASS evidence**: millions of people share yours. Identity lives in **MINUTIAE**: ridge endings, splits, dots, whose positions map uniquely to one finger. Analogy: class evidence says 'it was a sedan'; **individual evidence** reads the license plate. LIMIT: a partial print or a damaged hair may never reach individual level, and saying so is a finding, not a failure.

Comparison discipline: features first, conclusion last. List matching and mismatching features BEFORE you look at whose card it is. Bias runs on shortcuts; the feature list is the guardrail.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D07-A1

The reading uses a sedan and a license plate as an analogy. Which one is class evidence and which is individual? Copy the first three words of the sentence you used.

PBS-U1-
D07-A2

What does the root of a hair tell you, and what can it never tell you, according to the reading?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Comparing one questioned print against two elimination cards, features first

Practice case, not ours: a print lifted from a school locker door after a theft, compared with two elimination cards from people who use that hallway.



What to notice: Notice the numbered dots along the ridges: you count the tiny details first, and the name on the card stays covered until the count is done.

1. Cover the names on both cards. Write the questioned print's features first: pattern family is a right loop (class evidence: millions of people have right loops). Count the readable minutiae, the tiny ridge details: 16 (ridge endings, splits, one dot).
2. Compare against card 1, feature by feature, and tally. Matching minutiae: 13. Mismatching minutiae (a detail in one print that is absent or different in the other): 0.
3. Apply the lab's rule: at least 12 matches and 0 mismatches for an individual call. 13 is at least 12, and 0 mismatches. Call: consistent with card 1, INDIVIDUAL level.
4. Compare against card 2. Matching: 5. Mismatching: 3. Any mismatch ends it. Call: inconsistent with card 2 (excluded).
5. Report the proportion the sheet asks for: 13 matching out of 16 readable = 13 divided by 16 = 0.81 = 81 percent. If the count had been 9 of 16 (56 percent) with 0 mismatches, the honest sentence would be: inconclusive, insufficient minutiae for identification, pattern family consistent.
6. Now uncover the names and write the ceiling with the call: this print proves that the person on card 1 TOUCHED the locker door. It does not say when, and it does not say what they did.

Finished product: Right loop, 16 readable minutiae; 13 of 16 match card 1 with 0 mismatches (81 percent, individual call); 5 of 16 match card 2 with 3 mismatches (excluded). Touch is proven; time is not.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The trace lab opened. Team B compared the three blanket hairs (E7: H1, H2, H3) and the print lifts (E8) against elimination cards (known samples from named people) for the victim, Cole, Vasquez, Okoye, and the studio cleaner. Feature lists were written before any card's name was uncovered. The lab rule for this case: an individual call needs at least 12 matching minutiae (tiny ridge details) and zero mismatches.

QUESTIONED ITEM (E-NUMBER)	FEATURES LISTED FIRST	CALL, AND WITH WHICH CARD	CLASS OR INDIVIDUAL?
E7-H1 (blanket hair)	Dark brown, medium thickness, slight wave, continuous medulla (the central core of the hair), club-shaped root with no tissue (naturally shed)	(your call)	(your call)
E7-H2 (blanket hair)	Dark brown, medium thickness, slight wave, continuous medulla, club root, no tissue	(your call)	(your call)
E7-H3 (blanket hair)	Black, coarse, tight curl, fragmented medulla, club root, NO root tissue (old shed hair)	(your call)	(your call)
E8-L1 (fader panel lift)	Pattern family: right loop. 14 readable minutiae. 12 match the victim's card, 0 mismatch	(your call)	(your call)
E8-L2 (fader panel lift, aged partial overlay)	Pattern family: whorl. 8 readable minutiae. 6 match Cole's card, 0 mismatch; below threshold	(your call)	(your call)
E8-L3 (fader panel lift)	Pattern family: left loop. 15 readable minutiae. 13 match the cleaner's elimination card, 0 mismatch	(your call)	(your call)
E8-L4 (can lift)	Pattern family: right loop. 13 readable minutiae. 12 match the victim's card, 0 mismatch	(your call)	(your call)

Weakest call for B2	Decide which of your calls rests on the fewest readable features, and say why.
Root condition headline (Team B)	All three blanket hairs have club roots with no tissue: naturally shed, not pulled. No hair from the blanket is a DNA candidate by root; the root cannot say when any hair landed there.
Vasquez and Okoye	No hair or print from the scene is consistent with either card. That absence goes in the matrix as evidence against presence, with E7 and E8 as the E-numbers.
Numbers for B3	Lab rule: 12 matching minutiae and 0 mismatching. Practice print: 14 readable, 9 match, 0 mismatch. Work the percent and the call yourself.
Matrix entries made (Team F)	Fill from your own calls in Part B: each call goes in evidence-for or evidence-against with its E-number.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Fill one row per questioned item you compared today. Write the feature list BEFORE you look at whose elimination card it is; that order is the whole discipline.

QUESTIONED SAMPLE: the item from the scene whose source is unknown.

ELIMINATION SAMPLE: a known sample from a named person, used only to compare against. Also called a reference sample.

CONSISTENT WITH: the strongest phrase allowed for a hair: the features match a card, which proves a hair like that person's was present, not that the person was.

QUESTIONED ITEM (E-NUMBER)	FEATURES LISTED FIRST (COLOR, THICKNESS, ROOT, PATTERN FAMILY, MINUTIAE COUNT)	CALL: CONSISTENT, INCONSISTENT, OR INCONCLUSIVE, AND WITH WHICH CARD	CLASS OR INDIVIDUAL?

PBS-U1-D07-B1

Table complete: features before the name on every row, every call in the allowed words, every row labeled class or individual. (Scored on the table.)

PBS-U1-D07-B2

One of your calls was inconclusive (or pick the weakest one). Say exactly what stopped it from going further: a partial print, a damaged hair, or something else. Why is saying so a finding and not a failure?

PBS-U1-
D07-B3

☐

Practice numbers. Our lab's rule for this case: an individual call needs at least 12 matching minutiae and zero mismatching ones. A questioned print shows 14 minutiae you can read; 9 match the card and 0 mismatch. What fraction match, as a percent? What is the call under the rule, and what could you honestly say instead?

PART C · WRITE THE CALL

SEC 03

Suppose a hair from a scene is consistent with one elimination card and its root has tissue attached (a practice situation; in Case A the blanket hairs had no root tissue). Write the matrix note for that person of interest. Include three parts: the strongest sentence the evidence allows, the sentence you are NOT allowed to write and why, and what one more piece of evidence would move this from class toward individual.

Claim ceiling. A hair consistent with a person proves presence of a hair like theirs, not presence of the person, and never a time. Prints prove touch, not when.

PBS-U1-
D07-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D07-D1

☐

Use **class evidence** and **individual evidence** and **morphology** and **minutiae** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D07-E1

☐

Blood type B at a scene: class or individual evidence?

PBS-U1-
D07-E2

☐

What does a hair's root tell you, and what can it never tell you?

PBS-U1-
D07-E3

☐

Why list features before looking at names?

TURN IN

SLIP

Trace comparison sheet: Questioned items scored with feature lists; Class / individual label per call; Matrix entries made, with E-numbers.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: The Traces We Leave simulation at mendozabiomed.org/learn/lab-sim/pbs-the-traces-we-leave.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Handling, Preparation, Storage and Disposal (53.93 percent of the test), Ohio outcome 5.9 Clinical Laboratory Techniques and Procedures.

Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	5.5.5	Explain the principles of microscopy and process a specimen for light microscopy.
Ohio Health Science	5.8.4	Establish and implement procedures for systematic collection, organization and use of data.
Ohio Health Science	5.8.11	Draw conclusions and propose next steps based on observations and data analysis, recognizing that experimental results must be open to the scrutiny of others.
Ohio Health Science	1.2.7	Use problem-solving and consensus-building techniques to draw conclusions and determine next steps.
PLTW PBS framework	GLP-B.5	Demonstrate proper use of a microscope to view biological samples.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
PLTW PBS framework	CCP-B.1	Use mathematical computations to interpret data.
Common Core	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation of a complex process; summarize accurately.
Common Core	RST.9-10.4	Determine the meaning of symbols, key terms, and domain-specific words as used in a scientific or technical context.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do7-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.07a	Label a trace call as class or individual evidence and say what each can prove	items A1, D1, E1
PBS.S.07b	Compare features before names and report consistent, inconsistent, or inconclusive	items B1, B2, E3
PBS.S.07c	Count minutiae, apply the lab's threshold, and report a proportion	items B3
PBS.S.07d	Read a hair root as pulled versus shed and defend the strongest allowed sentence	items A2, C1, E2

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 17 OF 28 Wed, Sep 16 about 80 minutes**Investigation Day 8: Maybe Is a Result**

Today we need to accomplish run the presumptive blood decision flow on the candidate stains and practice reporting exactly what a screening test can and cannot say.

Our goal is run five evidence mini labs in one block, then decide whether this death was an accident or foul play and defend it with four exhibits.

You have to turn in Written CER (3-5 sentences) arguing whether investigators should test a sample exhaustively or only according to a hypothesis, with sample limitation cited in the reasoning. Post your CER to the discussion board or hand in the written copy before leaving.

Schoology assignment: Wk4 D08 · Maybe Is a Result

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D08 Case A briefing pack (read this)** (5 pages); then **D08 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Open today's mini lab circuit packet, linked at the top of this page, and read SEC 01 before you touch a station.

3

DO

SEC 02, prints: classify the pattern class of all five reference prints, then compare minutiae to the scene print.

HINT A presumptive positive buys a confirmatory test. It never buys a conclusion.

4

DO

SEC 03, the only wet lab: build the five-tube serial dilution, check both controls, and find your detection limit.

5

DO

SEC 04, gel: check both control lanes, build the standard curve from the ladder, then size the scene bands.

6

DO

SEC 05, bloodstains: measure width and length on the three controls first, then on the four scene stains.

7

DO

SEC 06, force: calculate the energy the fallen object carried and place it on the published injury band.

8

DO

SEC 07: write your verdict, naming four exhibits across at least three evidence types.

9

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

10

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk4 D08 · Maybe Is a Result**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D08
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 17 · Investigation Day 8 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that class evidence narrows the crowd. Individual evidence names one. Know which one you are holding.

Real serologists run a fast screening test that can only say 'maybe blood,' then send a positive on for confirmation, because calling something blood too early can send a whole case down the wrong road. Today you run that exact decision the pros use, and you write your results in their careful words.

OBJECTIVE

Today you will run the presumptive blood decision flow on the candidate stains and practice reporting exactly what a screening test can and cannot say.

Take-home (the ten-year idea): A presumptive positive buys a confirmatory test. It never buys a conclusion.

CASE FILE UPDATE

SEC 01

The candidate stains face the Kastle-Meyer decision flow. Also released: the spatter documentation card for the console-corner and floor stains.

Your UV sweep found candidate stains. Today they meet the Kastle-Meyer logic: a color-change screen that reacts to a component of blood, fast and cheap. Fast and cheap comes at a price: some vegetables and some metals can also trigger it. So KM sits exactly where the metal detector sat: it tells you which stains deserve the expensive tests.

The decision flow you will run is the whole lesson: (1) Document the stain. (2) Screen it. (3) Negative? Record it and stop: 'no indication of blood by presumptive screen' (note the careful words: not 'no blood'). (4) Positive? Record 'presumptive positive' and route a swab to confirmatory and DNA work. The flow forces the honest vocabulary at every exit.

Why so careful? Because the cost of the two errors is not symmetric. Calling a ketchup stain blood wastes a lab test. Calling a real bloodstain nothing might delete the only evidence of where a victim fell. When errors cost differently, the process must be built around the expensive error. That is a design principle you will meet again in medicine: screening tests are tuned to miss as little as possible and accept some false alarms.

Ethics rider: every test consumes sample. A swab tested today cannot be re-tested tomorrow. Deciding WHAT to spend evidence on is itself an ethical decision, and it goes in the log.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
confirmatory test	a slower lab test that can actually say yes	digging up the object the detector found
serology	the study of blood and other body fluids	reading the body's mail

THE DECISION OF THE DAY

SEC 03

YOUR ROLE

Team C leads; all teams run the flow.

THE SITUATION

Four candidate stains from your scene (E-numbered), limited swabs, and the KM decision flowchart in your notebook.

THE RULE YOU APPLY

Follow the flow exactly; use the exit vocabulary exactly; spend sample only with a logged reason.

WHAT YOU PRODUCE

Presumptive test report: each stain's flow path, result phrase, and route (stop / to confirmatory / to DNA).

Claim ceiling. The exit phrase is exact: presumptive positive for blood; confirmatory testing required. Species, source, and time remain unknown. The word blood alone, unqualified, stays out of the report.

WHAT THIS UNLOCKS

Tomorrow: typing grids and DNA collection, where maybe starts becoming whose.

PLTW ANCHOR AND INTERACTIVE LAYER

REF

Activity 1.1.4 Blood Evidence (referenced by title only; all materials in this file are John Hay original work)

- **Kastle-Meyer blood testing simulation** mendozabiomed.org/learn/lab-sim/pbs-kastle-meyer
- Portal: Kastle-Meyer simulation (pre-lab gate), day page, guided notes

LAB PROCEDURES FOR TODAY

SEC 08

Follow each illustrated procedure step by step. The full set is in the Lab Manual.

PROCEDURE: PRESUMPTIVE BLOOD TEST (KASTLE-MEYER)

HOW-TO



1. Document and photograph the stain before you touch it; testing consumes sample.
2. Rub a clean swab on the edge of the stain.
3. Add the reagent drops and watch for a color change within a few seconds.
4. Record the exact result phrase: NEGATIVE is 'no indication of blood by presumptive screen'; POSITIVE is 'presumptive positive, confirmatory required.'
5. Route positive swabs to confirmatory and DNA work, and log the sample you spent.

Safety and honesty: Presumptive means maybe. Several substances can trigger the test, so it aims the next test and never names the sample.

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Photograph each test result beside its E-tent; log references.

B Trace

Cross-index: any stain on a trace item gets flagged in both threads.

C Serology and DNA

Lead the flow. Expected: console and floor swabs presumptive positive; soda and rust controls negative (rust may surprise you either way; report what the flow says, spend a confirmatory only with a logged reason).

D Toxicology and Chemistry

Track reagent use and sample spend; brief the cost of testing at conference.

E Medical Examiner

Read E3 against body position; passive drops fall straight down; contact smear = something touched a wet stain. Write fall-versus-attack implications as QUESTIONS.

F Records and Timeline

Timeline and matrix updates; a stain's location is a fact, its meaning waits.

- Kastle-Meyer decision flowchart (run it in pencil per stain)
- Master evidence log updates
- Day 8 Cornell page

DAILY SUBMISSION FORM: PRESUMPTIVE TEST REPORT

JH-26-0831-A / D8

- ☐ Flow path per stain with result phrase
- ☐ Routing decision and reason
- ☐ Sample-spend log line

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D08-S
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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 17 · Investigation Day 8 of 18 · Maybe Is a Result

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOMES 5.8 AND 5.3

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 17, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real serologists run a fast screening test that can only say 'maybe blood,' then send a positive on for confirmation, because calling something blood too early can send a whole case down the wrong road. Today you run that exact decision the pros use, and you write your results in their careful words.

Today you will: run the presumptive blood decision flow on the candidate stains and practice reporting exactly what a screening test can and cannot say.

The ten-year idea: A presumptive positive buys a confirmatory test. It never buys a conclusion.

CONFIRMATORY TEST: a slower lab test that can actually say yes. Analogy to hold onto: digging up the object the detector found.

SEROLOGY: the study of blood and other body fluids. Analogy to hold onto: reading the body's mail.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Your UV sweep found candidate stains. Today they meet the Kastle-Meyer logic: a color-change screen that reacts to a component of blood, fast and cheap. Fast and cheap comes at a price: some vegetables and some metals can also trigger it. So KM sits exactly where the metal detector sat: it tells you which stains deserve the expensive tests.

The decision flow you will run is the whole lesson: (1) Document the stain. (2) Screen it. (3) Negative? Record it and stop: 'no indication of blood by presumptive screen' (note the careful words: not 'no blood'). (4) Positive? Record 'presumptive positive' and route a swab to confirmatory and DNA work. The flow forces the honest vocabulary at every exit.

Why so careful? Because the cost of the two errors is not symmetric. Calling a ketchup stain blood wastes a lab test. Calling a real bloodstain nothing might delete the only evidence of where a victim fell. When errors cost differently, the process must be built around the expensive error. That is a design principle you will meet again in medicine: screening tests are tuned to miss as little as possible and accept some false alarms.

Ethics rider: every test consumes sample. A swab tested today cannot be re-tested tomorrow. Deciding WHAT to spend evidence on is itself an ethical decision, and it goes in the log.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D08-A1

The reading names two kinds of things besides blood that can turn a Kastle-Meyer screen positive. Name them and copy the first three words of the sentence you used.

PBS-U1-
D08-A2

The reading says the cost of the two errors is not symmetric. What is each error, and which one does the flow protect against harder?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Running the presumptive flow on one stain and budgeting the sample

Practice case, not ours: a reddish smear on a wooden cutting board in a kitchen where someone reported a bad cut, and you have three swabs.



What to notice: Notice the swab was rubbed on the edge of the smear and the scale sits in the frame: the center of the stain and the untouched photo are both saved for the next test.

1. Step 1 of the flow, document: photograph the smear with a scale marker (photo C-01), locate it on the sketch (two measurements, in centimeters), and write the log row. Testing consumes and changes sample, so the untouched record exists first.
2. Step 2, screen: rub a clean swab on the EDGE of the smear (leave the center for later tests), add the first Kastle-Meyer reagent (a test chemical) (a test chemical called phenolphthalin) and watch: no color should appear yet, because a pink now means an oxidizer, not blood. Then add one drop of 3 percent hydrogen peroxide. Pink within about 3 seconds is the presumptive positive.
3. Step 3, exit with the exact phrase: presumptive positive for blood; confirmatory testing required. Not blood. Not confirmed. The screen can also be tripped by some vegetables and some metals, so pink means go on to a better test.
4. Step 4, route: send the remaining half of that swab to confirmatory and DNA work, with the reason logged (the smear is on the surface the injured person reportedly used).
5. Run the same flow on the other two swabs: a brown spot on the sink rim stays clear (no indication of blood by presumptive screen; stop) and a red spot on the counter turns pink (presumptive positive; confirmatory required).
6. Budget the sample. 3 swabs times 2 tests per swab = 6 tests. 3 screens used = 3 tests, leaving 3. The lab allows 1 confirmatory test for this practice case, so 1 of the 2 positives goes forward now: the cutting-board smear, because its location answers the question that matters (where the cut happened). The counter spot waits, and its report line stays at presumptive positive for blood; confirmatory testing required.

Finished product: Two of three stains screened presumptive positive, one negative; 6 tests total, 3 spent on screens; with one confirmatory allowed, the cutting-board smear goes forward for its location and the counter spot waits under the exact presumptive phrase.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The candidate stains met the Kastle-Meyer decision flow (a fast color-change screen for a component of blood). Team C ran the flow on four swabs: the two UV hits from day 6 and two control stains from elsewhere in the studio, all E-numbered. Every stain was documented before it was screened. The spatter documentation card (E3) was also released.

STAIN (E-NUMBER)	DOCUMENTED BEFORE SCREENING? (YES AND HOW)	SCREEN RESULT AND THE EXACT EXIT PHRASE	ROUTE AND THE REASON
E2-console (console-corner stain swab)	Yes: photos W-05 and UV-01 with scale, sketch location 412 cm from RP1 and 168 cm from RP2, log row from day 6	(run the flow: record the color change you would see, then the exact exit phrase)	(your routing decision and reason)
E2-floor (floor stain swab near the head end)	Yes: photos W-06 and UV-02 with scale, sketch location 431 cm from RP1 and 174 cm from RP2, log row from day 6	(run the flow: record the color change you would see, then the exact exit phrase)	(your routing decision and reason)
E2-ctrl-soda (dark soda spill near the couch)	Yes: photo W-21 with scale, sketch location 190 cm from RP1 and 455 cm from RP2	(run the flow: record the color change you would see, then the exact exit phrase)	(your routing decision and reason)
E2-ctrl-rust (rust mark on a cable plate)	Yes: photo W-22 with scale, sketch location 470 cm from RP1 and 120 cm from RP2	(run the flow: record the color change you would see, then the exact exit phrase)	(your routing decision and reason)

Log line for the negative (B2)	E2-ctrl-soda: no indication of blood by presumptive screen. Photo W-21. Sample remaining: one test. That line does not say no blood; a screen can miss a degraded or watered-down sample.
Sample budget (B3)	4 swabs, each with enough for 2 tests. Every stain got one screen. The lab allows this team 2 confirmatory tests. Both presumptive positives (E2-console and E2-floor) went forward; no positive had to wait.
E3 spatter documentation card (Team E reads it)	At the console corner: one contact smear (a mark made when something touched a wet stain) and passive drops on the floor below (round drops that fell straight down). No cast-off pattern (the arcs a swung object throws). No impact spatter field (the fine spray a blow produces). Team E wrote its fall-versus-attack implications as QUESTIONS only.
Reagent and sample spend logged (Team D)	4 screens run; 2 swab halves reserved for confirmatory; 2 negative swabs retained, untested half kept in custody.
Report phrase carried for every positive	Use the exact exit phrase the flowchart gives; a screen can say maybe, never yes.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Run the flow on the candidate stains your team was assigned. One row per stain. The result phrase must be one of the two exit phrases, word for word. Exit phrase 1: presumptive positive for blood; confirmatory testing required. Exit phrase 2: no indication of blood by presumptive screen.

SCREEN: a fast, cheap test that can only say maybe. Positive means go on to a better test; negative means no indication by this test.

ROUTE: where the swab goes next: stop, to a confirmatory test, or on to DNA.

STAIN (E-NUMBER)	DOCUMENTED BEFORE SCREENING? (YES AND HOW)	SCREEN RESULT AND THE EXACT EXIT PHRASE	ROUTE AND THE REASON

PBS-U1-D08-B1

☐

Table complete: every stain documented first, every result in an exact exit phrase, every route with a reason. (Scored on the table.)

PBS-U1-D08-B2

☐

One stain screened negative. Write the log line for it. Then explain why that line does not say no blood.

PBS-U1-D08-B3

☐

Practice numbers. Your team took 4 swabs, one per candidate stain, and each swab holds enough sample for 2 tests. How many tests can you run in total? Every stain gets one screen. The lab will run only 2 confirmatory tests for your team. How many positive stains can go forward, and which ones should? Show the arithmetic.

PART C · WRITE THE CALL

SEC 03

Of the stains that screened positive, your team must decide which two get the confirmatory test and which wait. Write the decision as a short memo. Include four parts: the two you chose, the evidence reason for each, the ethics

reason (what spending sample on one means for another), and the exact phrase the report will carry for the stains that only got a screen.

Claim ceiling. The exit phrase is exact: presumptive positive for blood; confirmatory testing required. Species, source, and time remain unknown. The word blood alone, unqualified, stays out of the report.

PBS-U1-
D08-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D08-D1

☐

Use **confirmatory test** and **serology** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D08-E1

☐

KM turns pink on a stain. Write the result phrase.

PBS-U1-
D08-E2

☐

KM stays clear. Does that prove no blood?

PBS-U1-
D08-E3

☐

Why does the flow ask you to document before screening?

TURN IN

SLIP

Presumptive test report: Flow path per stain with result phrase; Routing decision and reason; Sample-spend log line.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: Kastle-Meyer blood testing simulation at mendozabiomed.org/learn/lab-sim/pbs-kastle-meyer.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	5.3.14	Describe the uses and limitations of various lab assays (e.g., HPLC, immunoassay, drainage cell, multi aspect, latex agglutination, spectrophotometry).
Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	5.8.11	Draw conclusions and propose next steps based on observations and data analysis, recognizing that experimental results must be open to the scrutiny of others.
Ohio Health Science	1.3.3	Use ethical character traits consistent with workplace standards (e.g., honesty, personal integrity, compassion, justice).
PLTW PBS framework	ERM-A.7	Weigh the ethical implications of biomedical science decisions.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
PLTW PBS framework	CCP-B.1	Use mathematical computations to interpret data.
Common Core	RST.9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation of a complex process; summarize accurately.
Common Core	RST.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or recommendation.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do8-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.08a	Run the presumptive decision flow and use its exit phrases exactly	items B1, B2, E1, E2
PBS.S.08b	Explain why the two screening errors cost different amounts	items A1, A2, C1
PBS.S.08c	Budget a limited sample and log the reason for each spend	items B3, E3
PBS.S.08d	Use serology and confirmatory test correctly	items D1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These

scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 18 OF 28 Fri, Sep 18 about 80 minutes**Investigation Day 9: Whose Blood, Whose DNA**

Today we need to accomplish type blood with the agglutination grid, plan and collect DNA samples, and receive the first chemistry panel of the case.

Our goal is learn what an antibody is, how your body makes the right one, and how an ELISA turns antibody binding into a number you can measure.

You have to turn in Indicator-test data table: columns for sample ID, each of the four indicators, color result, and interpretation (positive/negative); plus dilution series data table with concentration and observed effect. Upload a photo of your completed data tables to the tracker before leaving class.

Schoology assignment: Wk4 D09 · Whose Blood, Whose DNA

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D09 Case A briefing pack (read this)** (6 pages); then **D09 Case A Daily Evidence Sheet (write on this)** (8 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Open the guided notes, linked at the top of this page, and keep them open for the whole block.

3

WRITE

Fill the twenty lines as we reach them. Do not write ahead; the order is the argument.

HINT Blood type shrinks the crowd. DNA names one person. The first panel numbers mean nothing without their reference ranges.

4

WRITE

Label all four diagrams in your own hand before you look at the printed labels.

5

DO

Follow the ELISA steps in SEC 06 and mark every place a wash happens.

6

DO

Start the ELISA debate preparation manual, which is the last handout of the week.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk4 D09 · Whose Blood, Whose DNA**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 18 · Investigation Day 9 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that a presumptive positive buys a confirmatory test. It never buys a conclusion.

Real DNA analysts type blood to narrow the field of who it could be, then collect their samples with great care, because a swab packaged wet grows mold that eats the DNA. Today you do the same collection the lab will depend on, and you meet the first hard number the case throws at you.

OBJECTIVE

Today you will type blood with the agglutination grid, plan and collect DNA samples, and receive the first chemistry panel of the case.

Take-home (the ten-year idea): Blood type shrinks the crowd. DNA names one person. The first panel numbers mean nothing without their reference ranges.

CASE FILE UPDATE

SEC 01

Serology day: type the confirmed-track stains, plan DNA, and swab the can rims. At the last ten minutes, the lab releases the glucose meter's memory: two readings that end the day on a cliffhanger.

Blood carries surface markers: A and B. Your immune system makes antibodies against the markers you lack, and when antibody meets its marker, cells clump: AGGLUTINATION. The typing grid uses that: mix a sample with anti-A serum and anti-B serum; where it clumps tells you the type. Type is CLASS evidence, and that is still powerful: a type mismatch can clear a suspect in one line. The rule: clumps in anti-A only means type A; anti-B only means B; both means AB; neither means O.

Analogy: blood type is the neighborhood, DNA is the street address. Typing says which neighborhood the sample lives in; the STR profile coming tomorrow reads the address. LIMIT: identical twins share the address, mixtures muddy the reading, and a degraded sample may only give a partial address. Even DNA has a claim ceiling.

DNA collection is mostly discipline you already own: swab, package DRY (moisture breeds mold that eats DNA), custody row, reference samples from named individuals for comparison. The lab does the chemistry; the case lives or dies on your collection and paperwork.

Late today, the first chemistry panel arrives from the lab. You built the tool for it on day 3: find each value's reference range before you react to the number. Team D owns the read; everyone logs it.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
agglutination	clumping of blood cells when antibodies grab matching markers	velcro balls finding their partner fabric
toxicology	the study of drugs and poisons in the body; the body's own numbers are read on a separate chemistry panel	the body's chemistry audit

YOUR ROLE

Team C leads serology; Team D receives the panel.

THE SITUATION

Typed grid results for the case samples, swabs to plan against limited supply, and a lab panel landing end of period.

THE RULE YOU APPLY

Type from the clumping pattern only; a mismatch is an exclusion and goes to the matrix immediately; every panel value stands next to its range before anyone speaks.

WHAT YOU PRODUCE

Serology worksheet: grid readings, type calls, exclusions logged; DNA collection plan executed; panel received and logged (interpretation tomorrow).

Claim ceiling. A type match narrows, it never names. The panel is DATA tonight; its meaning is tomorrow's work, after ranges.

WHAT THIS UNLOCKS

Tomorrow: STR strips and the panel interpretation, the two biggest evidence days of the case.

Activities 1.1.4 Blood Evidence + 1.1.5 DNA Evidence (referenced by title only; all materials in this file are John Hay original work)

- **DNA Evidence from the Scene simulation** mendozabiomed.org/learn/lab-sim/pbs-dna-evidence-from-scene
- Portal: DNA Evidence from the Scene simulation (pre-lab gate), day page, guided notes

Hand out only the exhibits listed for this day.

EXHIBIT 011 · Chemistry thread

RELEASED DAY 9

Glucose meter memory readout (SIMULATED)

GLUCOSE METER

Stored readings, memory download

SAT 11:02 AM

412 mg/dL

SAT 09:47 PM

mg/dL

HI

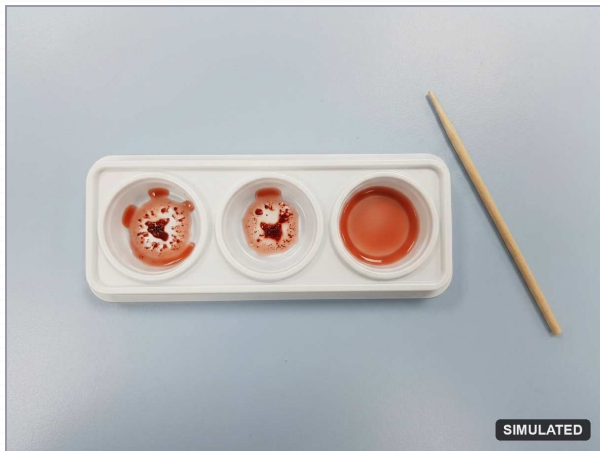
Reference range card: fasting glucose about 70 to 100 mg/dL. The meter shows HI when the reading is above its 600 mg/dL ceiling.

SIMULATED

Follow each illustrated procedure step by step. The full set is in the Lab Manual.

PROCEDURE: BLOOD TYPING (AGGLUTINATION)

HOW-TO



1. Place a drop of the sample in each of the test wells.
2. Add anti-A serum to one well and anti-B serum to another.
3. Mix each with a clean stir stick and watch for clumping (agglutination).
4. Read the type from the pattern: clumping with anti-A only is type A, with anti-B only is type B, with both is AB, with neither is O.

Safety and honesty: Type is CLASS evidence: a match narrows the crowd, it never names one person. The DNA does that.

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Photograph grids beside E-tents; log references.

B Trace

Deliver hair-root DNA candidates from day 7 to the collection plan.

C Serology and DNA

Type from the grids. Victim record: type B. Read each stain's grid yourself before checking any reference.

D Toxicology and Chemistry

Receive E5 at release, log values beside the range, say NOTHING interpretive until tomorrow. Post the numbers on the board before leaving.

E Medical Examiner

Note which samples map to the body vs the scene on the diagram margins.

F Records and Timeline

Matrix and timeline updates; exclusions are timeline-grade facts.

NOTEBOOK PAGES IN USE TODAY

SEC 06

- DNA workflow flowchart (collection half)
- Suspect matrix update
- Day 9 Cornell page

DAILY SUBMISSION FORM: SEROLOGY WORKSHEET

JH-26-0831-A / D9

- ☐ Grid readings and type calls
- ☐ Exclusions entered with E-numbers
- ☐ DNA collection plan rows
- ☐ Panel logged with ranges (no interpretation)

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D09-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 18 · Investigation Day 9 of 18 · Whose Blood, Whose DNA

OFFICIAL

WEBXAM · DOMAIN 1 HANDLING, PREPARATION, STORAGE AND DISPOSAL · OHIO OUTCOME 5.9

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 18, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real DNA analysts type blood to narrow the field of who it could be, then collect their samples with great care, because a swab packaged wet grows mold that eats the DNA. Today you do the same collection the lab will depend on, and you meet the first hard number the case throws at you.

Today you will: type blood with the **agglutination** grid, plan and collect DNA samples, and receive the first chemistry panel of the case.

The ten-year idea: Blood type shrinks the crowd. DNA names one person. The first panel numbers mean nothing without their reference ranges.

AGGLUTINATION: clumping of blood cells when antibodies grab matching markers. Analogy to hold onto: velcro balls finding their partner fabric.

TOXICOLOGY: the study of drugs and poisons in the body; the body's own numbers are read on a separate chemistry panel. Analogy to hold onto: the body's chemistry audit.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Blood carries surface markers: A and B. Your immune system makes antibodies against the markers you lack, and when antibody meets its marker, cells clump: **AGGLUTINATION**. The typing grid uses that: mix a sample with anti-A serum and anti-B serum; where it clumps tells you the type. Type is CLASS evidence, and that is still powerful: a type mismatch can clear a suspect in one line. The rule: clumps in anti-A only means type A; anti-B only means B; both means AB; neither means O.

Analogy: blood type is the neighborhood, DNA is the street address. Typing says which neighborhood the sample lives in; the STR profile coming tomorrow reads the address. LIMIT: identical twins share the address, mixtures muddy the reading, and a degraded sample may only give a partial address. Even DNA has a claim ceiling.

DNA collection is mostly discipline you already own: swab, package DRY (moisture breeds mold that eats DNA), custody row, reference samples from named individuals for comparison. The lab does the chemistry; the case lives or dies on your collection and paperwork.

Late today, the first chemistry panel arrives from the lab. You built the tool for it on day 3: find each value's reference range before you react to the number. Team D owns the read; everyone logs it.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D09-A1

The reading explains agglutination with markers and antibodies. In one sentence, why do cells clump when a sample meets anti-A serum? Copy the first three words of the sentence you used.

PBS-U1-
D09-A2

The reading calls blood type the neighborhood and DNA the street address. What limit does the reading put on the address?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Reading a typing grid and logging an exclusion (practice sample, not the case)

A training-kit stain, Practice Sample P, was tested against two practice reference cards, Person 1 (card says type A) and Person 2 (card says type O).



What to notice: Notice the difference between the two wells: grainy clumps on the left mean the antibodies found their marker, smooth liquid on the right means they did not, and that pair of looks is the whole reading.

1. Step 1. Look at the anti-A well for Sample P: the liquid is grainy with small dark clumps. Write: clumps with anti-A = YES.
2. Step 2. Look at the anti-B well for Sample P: the liquid is smooth and even. Write: clumps with anti-B = NO.
3. Step 3. Apply the sheet's rule (anti-A only = A; anti-B only = B; both = AB; neither = O). YES with anti-A and NO with anti-B means Sample P is type A.
4. Step 4. Compare to Person 1's card (type A): the types agree, so Person 1 is consistent with Sample P at class level. Write 'consistent with, not identified' in the exclusions column; every type A person is also consistent.
5. Step 5. Compare to Person 2's card (type O): type O versus a type A stain is a mismatch. Write: Person 2 EXCLUDED as the source of Sample P, reason: card type O, stain type A, with the sample's number beside it.
6. Step 6. Practice range check with a made-up value (the same method the sheet asks for): a lab value of 150 with a range of 70 to 99. Is it inside? No, above. How far above the top? $150 - 99 = 51$ points above. Percent of the top of the range? $150 \div 99 \times 100 = \text{about } 152 \text{ percent}$.

Finished product: Sample P is type A (clumps in anti-A only). Person 2 is excluded as its source; Person 1 is consistent at class level and nothing more. The practice value 150 sits 51 points above the top of its range, about 152 percent of that top.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

In class, Team C read the blood typing grids for the two stains, everyone packaged DNA swabs dry, and in the last ten minutes the lab released the glucose meter's memory. Use the rows below to fill the Part B grid table and to answer Part E from the reading.

SAMPLE (E-NUMBER)	CLUMPS WITH ANTI-A SERUM?	CLUMPS WITH ANTI-B SERUM?	TYPE CALLED
Console-corner stain (E2-console)	No (smooth well)	Yes (grainy clumps)	(your call from the clumping rule)
Floor stain (E2-floor)	No (smooth well)	Yes (grainy clumps)	(your call from the clumping rule)
Victim, medical record (reference)	No	Yes	(your call from the clumping rule)
Terrence Cole, donor record (reference)	Yes (grainy clumps)	No (smooth well)	(your call from the clumping rule)

Anti-B serum (defined)	A liquid containing antibodies that grab the B marker, the partner to the anti-A serum defined on the sheet. Clumping in it means the sample carries B.
Reference cards for Vasquez, Okoye, and Tran	Each card lists a type OTHER than B. The reference card shows a type other than B; write that as the reason.
Exclusions to log for BOTH stains	Your own: compare each reference card type to the type you called, and write excluded or not excluded with the E-number.
What the stains are consistent with	Your own: consistent with means the types agree, not proven to be the same person.
DNA swab collection sheets (for the E2 stain swabs and the E4 can-rim swabs; no new E-number)	Console stain swab; floor stain swab; three can-rim swabs (one per energy-drink can); blanket hair H3 root check (no root tissue available, so no DNA swab from it); reference swabs already on file for the victim and all four persons of interest.
Packaging state written on every custody row	Swab air-dried, sealed in a paper envelope (not plastic), labeled with the E-number, first custody row signed by the collector and the receiver.
Glucose meter memory (E5, released end of period, EXHIBIT 011)	Saturday 11:02 AM: 412 mg/dL. Saturday 9:47 PM: HI, meaning the reading was above the meter's 600 mg/dL ceiling, so the screen shows HI instead of a number. Reference range card: fasting glucose about 70 to 100 mg/dL. Logged beside the range with NO interpretation; that is tomorrow's work.
Simple range arithmetic for the 11:02 AM value (units)	412 mg/dL minus 100 mg/dL (top of range) = 312 mg/dL above the top of the range; 412 divided by 100, times 100 = 412 percent of the top of the range.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Read the typing grid for each case sample from the clumping pattern only. Then compare each type to the persons of interest on your elimination cards and log any exclusion.

ANTI-A SERUM: a liquid containing antibodies that grab the A marker. If the sample clumps in it, the sample carries A.

EXCLUSION: a mismatch that rules a person out for that stain. It goes in the evidence-against column of the suspect matrix with the E-number, today.

REFERENCE RANGE: the interval where healthy values usually land. A value is only high or low relative to its own range.

SAMPLE (E-NUMBER)	CLUMPS WITH ANTI-A? CLUMPS WITH ANTI-B?	TYPE CALLED (A, B, AB, OR O)	PERSONS EXCLUDED FOR THIS STAIN (WITH THE REASON)

PBS-U1-D09-B1

☐

Grid table complete: every call from the clumping pattern, every exclusion with a reason. (Scored on the table.)

PBS-U1-D09-B2

☐

A scene stain types the same as one person of interest. Write what that result proves and what it does not, in two sentences.

PBS-U1-D09-B3

☐

Practice numbers (not from the case). A lab value comes back at 180 with a reference range of 70 to 99. Is it inside the range? How many points above the top of the range is it? What percent of the top of the range is the value (180 divided by 99, times 100)? Show the work.

PART C · WRITE THE CALL

SEC 03

Write the DNA collection plan entry for one swab your team packaged today, as a procedure a new team member could follow. Cover four things: what was swabbed and where, how it was packaged and why dry matters, who signed the first custody row, and which reference samples it will be compared against. Four to six sentences.

Claim ceiling. A type match narrows, it never names. The panel is data tonight; its meaning is tomorrow's work, after ranges.

PBS-U1-
D09-C1

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D09-D1

Use **agglutination** and **toxicology** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D09-E1

Sample clumps with anti-A only. Type?

PBS-U1-
D09-E2

The scene stain is type B; a suspect is type O. What does the matrix get?

PBS-U1-
D09-E3

Why package swabs dry?

TURN IN

SLIP

Serology worksheet: Grid readings and type calls; Exclusions entered with E-numbers; DNA collection plan rows; Panel logged with ranges (no interpretation).

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: DNA Evidence from the Scene simulation at mendozabiomed.org/learn/lab-

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION**REF**

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Handling, Preparation, Storage and Disposal (53.93 percent of the test), Ohio outcome 5.9 Clinical Laboratory Techniques and Procedures.

Ohio Health Science	2.1.2	Describe the physical characteristics, components, and function of blood (e.g., ABO, Rh, blood cells, precursors and respiratory)
Ohio Health Science	5.9.1	Maintain the integrity of a clinical sample, including patient/client identification and chain of custody and explain how to adhere to chain-of-custody guidelines when required (e.g., forensic studies, drug screen).
Ohio Health Science	5.9.4	Discuss the methods of blood collection, specimen processing and labeling procedures and the potential problems that may occur.
Ohio Health Science	5.9.8	Differentiate between specimen collection, storage, and handling techniques (e.g., temperature, light, time, humidity).
Ohio Health Science	5.8.10	Create, interpret, and use tabular and graphical displays and describe the data.
PLTW PBS framework	EXD-B.3	Perform necessary calculations to analyze experimental data.
PLTW PBS framework	GLP-B.1	Use and apply principles of measurement.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	WHST.9-10.2	Write informative or explanatory texts, including scientific procedures and technical processes, with precise language and domain-specific vocabulary.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-4	Analyzing and interpreting data: analyze data using tools, technologies, and models to make valid and reliable scientific claims.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-Do9-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.09a	Read an agglutination grid and call a blood type from the clumping pattern only	items B1, E1
PBS.S.09b	Turn a type mismatch into an exclusion with an E-number, and say what a match cannot prove	items B2, E2, C1
PBS.S.09c	Compare a lab value to its reference range and report the difference with units	items B3
PBS.S.09d	Explain DNA packaging rules and use agglutination and toxicology correctly	items A1, A2, D1, E3

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 19 OF 28 Mon, Sep 21 about 80 minutes**Investigation Day 10: Barcodes and Panels**

Today we need to accomplish read STR strips against reference lanes to fill the DNA match matrix, interpret the chemistry panel against its reference ranges, and absorb a twist the case has been hiding.

Our goal is interpret biomolecule and toxicology data with a CER and assess method limitations.

You have to turn in CER stating which biomolecules are present in each unknown, using Wednesday's data table as evidence and citing comparison to positive and negative controls in the reasoning. Upload your CER and annotated data table to the tracker by end of class.

Schoology assignment: Wk4 D10 · Barcodes and Panels

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D10 Case A briefing pack (read this)** (7 pages); then **D10 Case A Daily Evidence Sheet (write on this)** (10 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

Compare unknown-sample results to your control results.

3

WRITE

Write a CER: which biomolecules are present in each unknown?

HINT A DNA profile names a source. A panel names a body state. Neither one, alone, names what happened.

4

DO

Analyze the dose-response trend in your toxicology dilution data.

5

DO

Identify two variables that could produce a false positive.

6

WRITE

State one limitation of indicator tests for forensic conclusions.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk4 D10 · Barcodes and Panels**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 21 · Investigation Day 10 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that blood type shrinks the crowd. DNA names one person. The first panel numbers mean nothing without their reference ranges.

Real analysts read a DNA gel band by band, and a match only counts when every band lines up, and they read a chemistry panel as a pattern rather than reacting to one value. Today you read both the same way, and the case hands you a twist that you weigh like any other piece of evidence.

OBJECTIVE

Today you will read STR strips against reference lanes to fill the DNA match matrix, interpret the chemistry panel against its reference ranges, and absorb a twist the case has been hiding.

Take-home (the ten-year idea): A DNA profile names a source. A panel names a body state. Neither one, alone, names what happened.

CASE FILE UPDATE

SEC 01

The two heaviest exhibits land: STR strips for the stains and can, and the full panel. Then the twist: the metadata sheet for those threatening DMs.

STR stands for short tandem repeat: a stretch of DNA where a short pattern repeats, and the NUMBER of repeats varies person to person. Measure the repeat count at several locations and you get a profile: a set of numbers so unlikely to repeat by chance that it works like a barcode. On a gel strip, longer repeats sit higher; matching a questioned lane to a reference lane means every band lines up.

Analogy: each STR site is one stripe of a barcode; one matching stripe is nothing, the full set matching is identification. LIMIT: mixtures put two barcodes in one lane, partial profiles fade stripes, and a match names a SOURCE, not a time or an action. DNA on a cup proves someone's cells reached it; it does not prove when, how, or what else they did.

The panel: a toxicology screen checks for classes of drugs and poisons (usually by immunoassay: antibody locks that trip for one target class), and a chemistry panel measures the body's own numbers. Interpretation is the day-3 skill at full power: value next to range, flag or clear, pattern across values. One flag is a clue; a coherent PATTERN of flags is a mechanism talking.

Today also delivers a twist exhibit. Rule for twists: same discipline as everything else. New evidence does not restart the case; it joins the matrix and the timeline and gets weighed like every other exhibit.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
STR	short tandem repeat: a stretch of DNA whose repeat count varies person to person	a barcode stripe width
DNA profile	the set of STR lengths that identifies one person	the whole barcode
immunoassay	a fast screening test that uses antibodies to detect one target class of chemical	a lock that only one key trips

YOUR ROLE

Team C leads STR reads; Team D leads the panel; everyone logs both.

THE SITUATION

STR strip sheet with questioned lanes and reference lanes; the full panel with ranges; one twist exhibit released mid-period.

THE RULE YOU APPLY

A match call requires EVERY band aligned; anything less is 'cannot exclude' or 'excluded.' Panel values speak only beside their ranges; patterns beat single flags.

WHAT YOU PRODUCE

DNA match matrix completed; panel interpretation sheet: each value flagged or cleared, then the pattern read in one paragraph.

Claim ceiling. The matrix says whose DNA is on what. The panel says what state the body was in. What HAPPENED is still a day-16 question; do not let today's power tempt an early verdict.

WHAT THIS UNLOCKS

The medical thread: the body itself starts answering questions.

Activities 1.1.6 DNA Analysis + 1.2.3 Forensic Toxicology (referenced by title only; all materials in this file are John Hay original work)

- **DNA Fingerprinting simulation** mendozabiomed.org/learn/lab-sim/pbs-dna-fingerprinting
- **Toxicology and Drug Delivery simulation** mendozabiomed.org/learn/lab-sim/pbs-toxicology-drug-delivery
- Portal: DNA Fingerprinting simulation and Toxicology simulation (pre-lab gates), day page, guided notes

Hand out only the exhibits listed for this day.

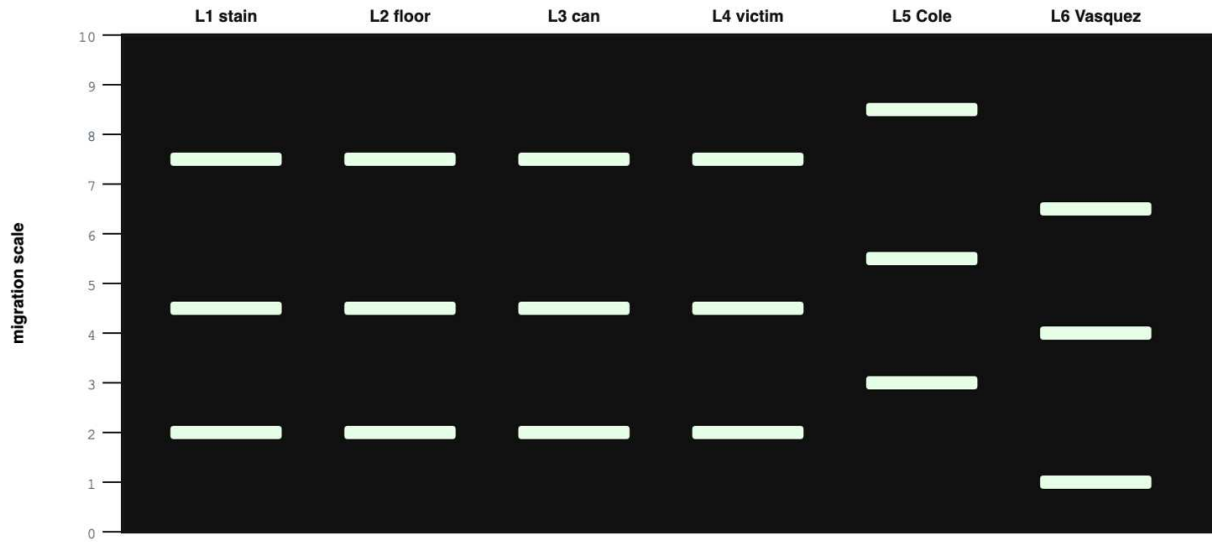
EXHIBIT 012 · DNA thread

RELEASED DAY 10

STR strip sheet, six lanes (SIMULATED)

STR DNA COMPARISON GEL

Longer repeats sit higher. A MATCH means every band aligns.



Lanes L1, L2, and L3 align with L4 (the victim) at every band. L5 and L6 do not. The stains and the can are all the victim's DNA.

SIMULATED

EXHIBIT 013 · Chemistry thread

RELEASED DAY 10

Toxicology and chemistry report (SIMULATED)

TOXICOLOGY AND CHEMISTRY REPORT

Medical Examiner laboratory

Drug immunoassay screen

NEGATIVE, all classes (opioids, stimulants, sedatives, cocaine, cannabinoids). Ethanol: negative

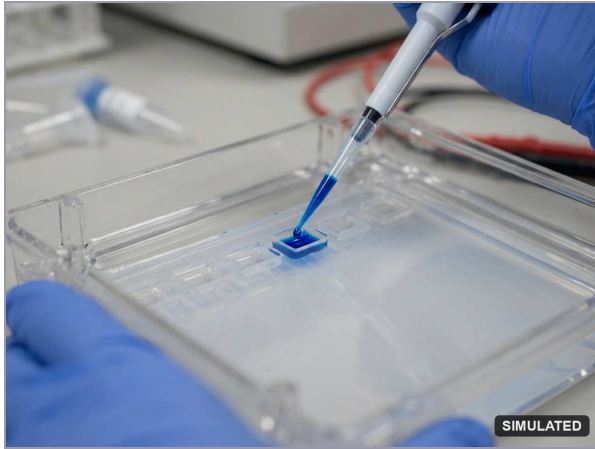
CHEMISTRY	RESULT	REFERENCE	FLAG
Vitreous glucose	612 mg/dL	70 to 100	HIGH
Beta-hydroxybutyrate	8.2 mmol/L	below 0.6	HIGH
Potassium	6.4 mmol/L	3.5 to 5.0	HIGH
Bicarbonate	9 mmol/L	22 to 28	LOW

Vitreous (eye-fluid) glucose is used because blood glucose is unreliable after death. Read the PATTERN, not one value.

SIMULATED

Follow each illustrated procedure step by step. The full set is in the Lab Manual.

PROCEDURE: READING A DNA (STR) GEL**HOW-TO**



1. Load each questioned and reference sample into its own lane with a micropipette.
2. Run the gel so the bands separate by length, longer repeats sitting higher.
3. Compare the questioned lane to each reference lane, band by band.
4. A MATCH means every band aligns; anything less is 'cannot exclude' or 'excluded.' Record the call per lane pair.

Safety and honesty: A DNA match names a SOURCE, never a time or an action. Say only what the barcode can carry.

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Log all result documents into the evidence log with references.

B Trace

Bring day-7 hair calls to the matrix: which hairs now have profiles.

C Serology and DNA

STR reads: match calls lane by lane. Expected work product: L1 and L2 match L4 at every band; L3 matches L4; L5 and L6 excluded.

D Toxicology and Chemistry

Panel read: every value beside its range; then the pattern paragraph. The screen negatives matter as much as the chemistry positives.

E Medical Examiner

Note which panel flags predict autopsy findings; write two predictions as questions.

F Records and Timeline

Weigh the twist: what do 11-month-old messages do to the Vasquez motive line? Update the matrix with the metadata E-number.

- DNA match matrix organizer
- Tox interpretation table
- Suspect matrix and timeline updates
- Day 10 Cornell page

DAILY SUBMISSION FORM: DNA MATCH MATRIX + TOX INTERPRETATION

JH-26-0831-A / D10

- ☐ Match matrix with call per lane pair
- ☐ Panel sheet: value, range, flag
- ☐ Pattern paragraph
- ☐ Twist logged in matrix and timeline

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 21 · Investigation Day 10 of 18 · Barcodes and Panels

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOMES 5.8, 5.4, AND 5.3

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 21, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real analysts read a DNA gel band by band, and a match only counts when every band lines up, and they read a chemistry panel as a pattern rather than reacting to one value. Today you read both the same way, and the case hands you a twist that you weigh like any other piece of evidence.

Today you will: read **STR** strips against reference lanes to fill the DNA match matrix, interpret the chemistry panel against its reference ranges, and absorb a twist the case has been hiding.

The ten-year idea: A DNA profile names a source. A panel names a body state. Neither one, alone, names what happened.

STR: short tandem repeat: a stretch of DNA whose repeat count varies person to person. Analogy to hold onto: a barcode stripe width.

DNA PROFILE: the set of STR lengths that identifies one person. Analogy to hold onto: the whole barcode.

IMMUNOASSAY: a fast screening test that uses antibodies to detect one target class of chemical. Analogy to hold onto: a lock that only one key trips.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

STR stands for short tandem repeat: a stretch of DNA where a short pattern repeats, and the **NUMBER** of repeats varies person to person. Measure the repeat count at several locations and you get a profile: a set of numbers so unlikely to repeat by chance that it works like a barcode. On a gel strip, longer repeats sit higher; matching a questioned lane to a reference lane means every band lines up.

Analogy: each **STR** site is one stripe of a barcode; one matching stripe is nothing, the full set matching is identification. **LIMIT**: mixtures put two barcodes in one lane, partial profiles fade stripes, and a match names a **SOURCE**, not a time or an action. DNA on a cup proves someone's cells reached it; it does not prove when, how, or what else they did.

The panel: a toxicology screen checks for classes of drugs and poisons (usually by **immunoassay**: antibody locks that trip for one target class), and a chemistry panel measures the body's own numbers. Interpretation is the day-3 skill at full power: value next to range, flag or clear, pattern across values. One flag is a clue; a coherent **PATTERN** of flags is a mechanism talking.

Today also delivers a twist exhibit. Rule for twists: same discipline as everything else. New evidence does not restart the case; it joins the matrix and the timeline and gets weighed like every other exhibit.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-

D10-A1

What does STR stand for, and what about it varies from person to person? Copy the first three words of the sentence you used.

PBS-U1-

D10-A2

The reading says a DNA match names a source, not a time or an action. In your own words, why does that limit matter for this case?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Reading STR lanes and making the three allowed calls (practice gel, not the case)

A training gel has one questioned lane, Q (a swab from a practice water bottle), and three reference lanes, R1, R2, and R3, each with four bands read against the migration scale.



What to notice: Notice that a match is a whole-column judgment: lanes one and two line up at every band, and lane three differs, which is what an exclusion looks like on a gel.

1. Step 1. Lay a straightedge across the gel at each band in lane Q and read the scale: Q bands sit at 8.0, 6.0, 3.5, and 1.5. Write them down before looking at any reference lane.
2. Step 2. Read R1 the same way: 8.0, 6.0, 3.5, 1.5. Compare band by band: four of four aligned. Call: MATCH. Limit: R1 is the source of the cells on the bottle; the gel does not say when or why.
3. Step 3. Read R2: 8.0, 5.0, 3.5, 1.5. Compare: the second band sits at 5.0, not 6.0. One band clearly differs. Call: EXCLUDED. Limit: R2 is ruled out as the source of this swab only, not ruled out of anything else.
4. Step 4. Read R3: 8.0, 6.0, and 1.5 are aligned, but the band near 3.5 is too faint to place. Three readable bands align, one is unreadable. Call: CANNOT EXCLUDE (not a match; a match needs every band). Limit: a partial read never carries an identification.
5. Step 5. Match-strength arithmetic with practice numbers: the lab says a full 4-site match like R1's happens by chance in about 1 of 60,000 unrelated people. As a decimal: 1 divided by 60,000 = 0.0000167, about 0.00002. R3's 3-site partial is 1 in 4,000: 1 divided by 4,000 = 0.00025. The smaller decimal is the rarer match, so R1 is the stronger identification.
6. Step 6. Practice panel row (made-up value): sodium 128 mmol/L with a reference range of 135 to 145 mmol/L. Inside? No, below. How far? 135 minus 128 = 7 mmol/L below the bottom of the range. Flag it LOW and write the number beside the range; interpretation waits for the pattern.

Finished product: Q matches R1 (four of four bands), excludes R2 (one band differs), and cannot exclude R3 (one band unreadable). The full match is rarer by chance (0.000002) than the partial (0.00025), so it is the stronger identification; the practice sodium value sits 7 mmol/L below its range.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

ABSENT OR NEW TO THE CLASS? START HERE

In class, Team C read the STR strip sheet lane by lane, Team D logged the chemistry panel value by value beside its range, and mid-period the DM (direct message) metadata sheet arrived as the twist. The gel's left edge carries a migration scale from 10 (top) to 0 (bottom); band positions below are read off that scale.

LANE	WHAT IT IS	BAND POSITIONS ON THE MIGRATION SCALE (TOP TO BOTTOM)
L1	Console stain	7.5, 4.5, 2.0
L2	Floor stain	7.5, 4.5, 2.0
L3	Can rim composite (three cans)	7.5, 4.5, 2.0
L4	Victim reference	7.5, 4.5, 2.0
L5	Cole reference	8.5, 5.5, 3.0
L6	Vasquez reference	6.5, 4.0, 1.0

Migration scale (defined)	The ruler printed beside the gel. A band's number on it is its position; two bands at the same number are aligned. Longer repeats sit higher on this gel.
Make your own match calls from the band positions above (Part B rows)	Compare each stain lane against each reference lane band by band. A match needs every band aligned; anything less is cannot exclude, and a lane with a band the reference lacks is excluded.
Okoye and Tran request cards	Reference lanes on request cards; neither aligns with L1, L2, or L3. EXCLUDED for the stains and the can.
Limit to write in every match row	A match names the SOURCE of the DNA (whose cells), not when they got there or what that person did.
Panel E10 (EXHIBIT 013): drug screen	Immunoassay screen negative in every class (opioids, stimulants, sedatives, cocaine, cannabinoids). Ethanol (drinking alcohol), measured separately: negative. No specific poison indicated on targeted testing.
Panel E10: vitreous glucose	612 mg/dL; reference 70 to 100 mg/dL; outside the range, ABOVE. Vitreous means the clear fluid inside the eye; it is used because blood sugar is unreliable after death.
Panel E10: beta-hydroxybutyrate	8.2 mmol/L; reference below 0.6 mmol/L; outside the range, ABOVE. The exhibit's own key calls it a ketone, an acid the body makes when it burns fat for fuel instead of sugar.
Panel E10: potassium	6.4 mmol/L; reference 3.5 to 5.0 mmol/L; outside the range, ABOVE. Potassium is a mineral the blood keeps in a narrow band.
Panel E10: bicarbonate	9 mmol/L; reference 22 to 28 mmol/L; outside the range, BELOW. The exhibit's key calls bicarbonate the blood's acid buffer, the chemical that soaks up acid; when acid floods in, it drops.
Pattern sentence a team could write (direction only, no cause word)	Three of the body's own chemistry values sit far above their ranges and the acid buffer sits far below, while every drug and alcohol screen is negative.
Twist exhibit E9b (DM metadata sheet)	Platform records show every threatening DM from the Vasquez-linked account was sent 11 months ago, during a public lease dispute that ended when she leased elsewhere; no messages from that account to the victim in the last 10 months. The Day 4 printout showed no send dates; this sheet supplies them.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

Read the STR strip sheet lane by lane. A match call needs EVERY band aligned; anything less is cannot exclude (some bands unreadable) or excluded (a band clearly differs). Then log the panel: every value beside its range before anyone speaks.

LANE: one column of bands on the strip sheet. Questioned lanes come from scene samples; reference lanes come from named people.

BAND: one dark stripe in a lane. Its position is the repeat count at one STR site.

FLAG: a panel value outside its reference range. One flag is a question; a pattern of flags is a lead.

QUESTIONED LANE VS REFERENCE LANE	BANDS ALIGNED? (ALL, SOME, OR ONE DIFFERS)	CALL: MATCH, CANNOT EXCLUDE, OR EXCLUDED	WHAT THAT CALL PROVES AND DOES NOT PROVE

PBS-U1-
D10-B1

Match matrix complete: one row per lane pair, every call one of the three allowed words, every row with its limit. (Scored on the table.)

PBS-U1-
D10-B2

From the panel: list every value that sits outside its range, with the range beside it. Then write ONE sentence about the pattern the flags make together, without naming a cause.

PBS-U1-
D10-B3

Practice numbers (not from the case). A lab reports that a full 6-site STR match would occur by chance in about 1 of 10,000,000 unrelated people; with one site unreadable, a 5-site match is about 1 in 800,000. Write both as decimals (1 divided by the number). Which lane is the stronger identification, and what allowed call does the 5-site lane get?

PART C · WRITE THE CALL

SEC 03

The twist exhibit arrived today. Write the timeline and matrix note for it in three parts: what the exhibit states (observation), what it changes about an earlier assumption (inference, labeled), and what it does NOT settle. End with the sentence that keeps today inside the ceiling: the matrix says whose, the panel says what state, and what happened is still open.

Claim ceiling. The matrix says whose DNA is on what. The panel says what state the body was in. What happened is still a Day 16 question; do not let today's power tempt an early verdict.

PBS-U1-
D10-C1

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D10-D1

Use **STR** and **DNA profile** and **immunoassay** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-

D10-E1

☐

One band matches between a questioned and reference lane. Match?

PBS-U1-

D10-E2

☐

What can a full STR match on the scene stain prove, and not prove?

PBS-U1-

D10-E3

☐

Why do we read panel patterns instead of celebrating single flags?

TURN IN

SLIP

DNA match matrix + tox interpretation: Match matrix with call per lane pair; Panel sheet: value, range, flag; Pattern paragraph; Twist logged in matrix and timeline.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: DNA Fingerprinting simulation at mendozabiomed.org/learn/lab-sim/pbs-dna-fingerprinting; Toxicology and Drug Delivery simulation at mendozabiomed.org/learn/lab-sim/pbs-toxicology-drug-delivery.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	5.4.13	Use electrophoresis to separate nucleic acids and determine molecular weight.
Ohio Health Science	5.4.9	Compare nucleic acids and chromosomal DNA molecules using a sequence database.
Ohio Health Science	5.3.14	Describe the uses and limitations of various lab assays (e.g., HPLC, immunoassay, drainage cell, multi aspect, latex agglutination, spectrophotometry).
Ohio Health Science	5.8.8	Compute measures of central tendency and dispersion to interpret results and draw conclusions.
Ohio Health Science	5.8.11	Draw conclusions and propose next steps based on observations and data analysis, recognizing that experimental results must be open to the scrutiny of others.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
PLTW PBS framework	CCP-B.1	Use mathematical computations to interpret data.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-4	Analyzing and interpreting data: analyze data using tools, technologies, and models to make valid and reliable scientific claims.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D10-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.10a	Read STR lanes and make only the three allowed calls: match, cannot exclude, excluded	items B1, E1, E2
PBS.S.10b	Compare a value to its reference range and read a pattern across values, not one flag	items B2, E3
PBS.S.10c	Reason about match strength with numbers	items B3
PBS.S.10d	Keep source, state, and event apart when writing a finding	items A1, A2, C1, D1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 20 OF 28 Wed, Sep 23 about 80 minutes**Investigation Day 11: Who Speaks for the Dead**

Today we need to accomplish work the ethics that govern the medical examination of a death: who decides, what dignity requires, and why the autopsy exists at all.

Our goal is debate whether autopsies should require family consent, and defend your view with reasoning.

You have to turn in Written CER (3-5 sentences) arguing whether autopsies should require family consent, with a reference to either investigative truth or bodily autonomy in the reasoning. Post your CER to the discussion board or hand in the written copy before leaving.

Schoology assignment: Wk5 D11 · Who Speaks for the Dead

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D11 Case A briefing pack (read this)** (4 pages); then **D11 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Read the prompt: Whose body is it after death, and who decides?

3

WRITE

List one argument for required consent and one for mandatory autopsy.

HINT An autopsy is the last physical exam, performed for the living as much as the dead: it answers the questions the body can still answer.

4

DO

Choose a side and connect it to the value of investigative truth.

5

WRITE

Argue your claim in your group with one reason and one example.

6

TURN IN

Post a written CER with your position and supporting evidence.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk5 D11 · Who Speaks for the Dead**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D11
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 23 · Investigation Day 11 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that a DNA profile names a source. A panel names a body state. Neither one, alone, names what happened.

Real medical examiners have to decide who is allowed to authorize an examination and how to respect a grieving family, because the truth of a death is a public good that sometimes strains private wishes. Today you weigh those same real ethical questions before the medical work begins.

OBJECTIVE

Today you will work the ethics that govern the medical examination of a death: who decides, what dignity requires, and why the autopsy exists at all.

Take-home (the ten-year idea): An autopsy is the last physical exam, performed for the living as much as the dead: it answers the questions the body can still answer.

CASE FILE UPDATE

SEC 01

The medical thread pauses for the question that governs it: who authorizes an autopsy here, and what does dignity require? (Our case's examination is ordered today, over no family objection: Marcus's next of kin consented.)

Before the medical thread opens its instruments, it has to answer a human question: by what right? A medical examiner is a physician with legal authority to investigate certain deaths: sudden, unexplained, violent, or in official custody. In those deaths the examination is not optional and family consent is not required by law, because society has decided the truth of a death is a public good. That decision has costs, and today you weigh them honestly.

Dignity requirements are not decoration: examinations are documented, limited to what the question requires, and the person is treated as a patient to the end. Many traditions have burial timelines and bodily-integrity beliefs that an autopsy strains. Examiners accommodate what can be accommodated (speed, minimal technique, returning all tissues) and must sometimes proceed over objection. The honest frame is a conflict of real goods: family autonomy and religious liberty against public truth and, sometimes, justice for the dead themselves.

Why perform one at all? Because some questions only the body can answer: which injury came first, what disease was hiding, whether a death that looks like one manner is actually another. Getting cause and manner right protects the living: it catches dangerous products, missed diseases, and disguised violence.

Today is a position-taking day: you will argue a side, steelman the other, and notice that the discipline is the same as the lab's: reasons you can point to, limits you must state.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
autopsy	the systematic medical examination of a body to determine cause and manner of death	the final physical exam

YOUR ROLE

You sit on a review board.

THE SITUATION

A structured scenario packet (in this pack) presents a death where the family objects to autopsy on religious grounds and the examiner believes the manner is in genuine doubt.

THE RULE YOU APPLY

Name the interests on each side, the accommodations available, and the deciding principle you apply. A position without the other side's best argument is incomplete.

WHAT YOU PRODUCE

Ethics position slip: your ruling, the strongest opposing argument stated fairly, and the accommodation you would order.

Claim ceiling. This is a reasoning exercise on a fictional scenario. Real cases involve real law, real faith, and real families; our ruling binds nobody.

WHAT THIS UNLOCKS

Tomorrow the body starts answering: external exam and time of death.

Activity 1.2.1 Anatomy of an Autopsy (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

myPLTW student access is down for technical reasons. When it is restored, this day's PLTW anchor is completed online; until then the portal simulation and these printed materials carry the day.

INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Chair one exchange pair-group; keep the steelman rule honest.

B Trace

Chair one exchange pair-group.

C Serology and DNA

Chair one exchange pair-group.

D Toxicology and Chemistry

Chair one exchange pair-group.

E Medical Examiner

Brief the class on what tomorrow's external exam involves, from the day-12 preview card.

F Records and Timeline

Log today as a timeline event: the autopsy decision date in our case.

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Day 11 Cornell page
- Vocabulary bank: autopsy entry

DAILY SUBMISSION FORM: ETHICS POSITION SLIP

JH-26-0831-A / D11

- ☐ Ruling with deciding principle
- ☐ Strongest opposing argument, stated fairly
- ☐ Accommodation ordered

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D11-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 23 · Investigation Day 11 of 18 · Who Speaks for the Dead

OFFICIAL

WEBXAM · EMPLOYABILITY AND ETHICS · OHIO OUTCOMES 1.3, 6.2, AND 2.2 · REASONING SKILLS TESTED ACROSS WEBXAM DOMAIN 2

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 23, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real medical examiners have to decide who is allowed to authorize an examination and how to respect a grieving family, because the truth of a death is a public good that sometimes strains private wishes. Today you weigh those same real ethical questions before the medical work begins.

Today you will: work the ethics that govern the medical examination of a death: who decides, what dignity requires, and why the **autopsy** exists at all.

The ten-year idea: An autopsy is the last physical exam, performed for the living as much as the dead: it answers the questions the body can still answer.

AUTOPSY: the systematic medical examination of a body to determine cause and manner of death. Analogy to hold onto: the final physical exam.

JURISDICTION: the set of deaths the law gives a medical examiner the authority to investigate: sudden, unexplained, violent, or in custody. Analogy to hold onto: the referee's field of play.

ACCOMMODATION: a change to how an examination is done so a family's needs are respected while the question still gets answered. Analogy to hold onto: an ADA ramp.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Before the medical thread opens its instruments, it has to answer a human question: by what right? A medical examiner is a physician with legal authority to investigate certain deaths: sudden, unexplained, violent, or in

official custody. In those deaths the examination is not optional and family consent is not required by law, because society has decided the truth of a death is a public good. That decision has costs, and today you weigh them honestly.

Dignity requirements are not decoration: examinations are documented, limited to what the question requires, and the person is treated as a patient to the end. Many traditions have burial timelines and bodily-integrity beliefs that an **autopsy** strains. Examiners accommodate what can be accommodated (speed, minimal technique, returning all tissues) and must sometimes proceed over objection. The honest frame is a conflict of real goods: family autonomy and religious liberty against public truth and, sometimes, justice for the dead themselves.

Why perform one at all? Because some questions only the body can answer: which injury came first, what disease was hiding, whether a death that looks like one manner is actually another. Getting cause and manner right protects the living: it catches dangerous products, missed diseases, and disguised violence.

Today is a position-taking day: you will argue a side, steelman the other, and notice that the discipline is the same as the lab's: reasons you can point to, limits you must state.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D11-A1

According to the reading, which deaths fall under a medical examiner's legal authority? Copy the first three words of the sentence you used.

PBS-U1-
D11-A2

The reading says an autopsy is performed for the living as much as the dead. Name two ways the reading says getting cause and manner right protects living people.

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Filling the interests table and writing a ruling with a steelman (practice scenario, not the packet)

A 19-year-old collapses and dies during a track meet; the family wants the body released within two days for a funeral, and the examiner suspects an undiagnosed heart condition that the athlete's two younger siblings could share.



What to notice: Notice that the folder is closed and the chair is empty: the ruling has to be written so the person who is not in the room could read it and see how you got there.

1. Step 1. Name the sides before ruling: the family, the examiner, the public (here, the siblings and other young athletes). Three rows, no arguments yet.
2. Step 2. Write each side's interest in one sentence. Family: bury their child on time and whole. Examiner: learn what stopped a young heart, which only the body can answer. Public: if the cause runs in the family, two living siblings need to know.
3. Step 3. State each side's strongest argument the way its best defender would. Family: 'Our grief and our faith are real, and the death was witnessed by hundreds; nobody suspects a crime.' Examiner: 'A witnessed collapse tells me it was sudden, not why; a hidden heart condition is exactly the kind of thing that kills the next sibling.' Public: 'Getting cause right protects the living.'
4. Step 4. List the accommodations that fit: expedite so the two-day timeline holds; a targeted examination of the heart only; return of all tissues; imaging first, opening only if imaging cannot answer.
5. Step 5. Pick the deciding principle and say it so a person who disagrees can see how you got there: 'When a finding could protect identifiable living people, the examination proceeds, in the smallest and fastest form that answers the question.'
6. Step 6. Write the ruling in one sentence: a targeted heart examination, expedited to meet the funeral, all tissues returned. Then write the strongest argument against your own ruling, fairly: 'A targeted exam is still an opening of the body the family holds sacred, and genetic testing on a blood sample from the siblings themselves could answer the family question without touching the deceased.' Say what would change your mind: evidence that the sibling testing really is as reliable.
7. Step 7. Check the ceiling: this is a fictional scenario; the ruling binds nobody, and the tone respects every person in it.

Finished product: Ruling: a targeted, expedited heart examination with all tissues returned, under the principle that a finding that can protect identifiable living people justifies the smallest examination that answers the question. Strongest opposing argument, stated fairly: sibling blood testing might answer the family question without opening the body at all.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

There was no lab work today. The class sat as a review board on a separate, fictional scenario packet (DOC-5), argued both sides in pairs, swapped sides, and wrote position slips. Our own case's authorization memo was attached: the examination is ordered and the next of kin (the closest living relative, who speaks for the family) consented, so the debate stays hypothetical.

Scenario, the death	A 44-year-old is found dead at the bottom of a staircase in a shared house. The fall could explain everything first responders saw. The house had a history of loud disputes, and one housemate gave three slightly different versions of the evening.
Scenario, the examiner's view	The medical examiner believes the manner of death is genuinely uncertain: an examination could tell a simple fall from an injury that happened before the fall.
Scenario, the family's objection	The family objects to any autopsy on sincere religious grounds. Their tradition requires burial within a strict timeline and holds the body's integrity (the body kept whole) sacred. They have retained an advocate (a person who speaks for them) and asked, respectfully and firmly, for release unexamined.
Scenario, the law and the options	State law gives the examiner authority to proceed when manner is in doubt. Authority is not obligation. The office may: perform a full examination; perform a limited (targeted) examination; use only external findings and imaging (scans such as X-ray or CT, which look inside without opening); expedite (speed up) to meet the burial timeline; or release without examination and close the case as undetermined (no manner assigned).
Roles argued in pairs	The family's advocate; the examiner; a public-interest representative (what the community loses if manners of death go unexamined); the housemate's attorney (what that client loses if the case stays undetermined forever).
Accommodations named in the reading (for Part B2)	Speed (release within the burial timeline); minimal or targeted technique; return of all tissues; external-and-imaging-only examination. The reading's answer to 'which still answers the question in doubt': a targeted technique aimed at the injury in question.
Jurisdiction rule from the reading (for Part E)	Sudden, unexplained, violent, or in-custody deaths fall under the examiner's legal authority; in those, family consent is not required by law because the truth of a death is treated as a public good.
Our case today	Timeline entry for Team F: the autopsy authorization date. No new physical evidence. Tomorrow the external exam and time of death open.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Use the scenario packet in today's pack. Fill the interests table before you rule. A position without the other side's best argument is incomplete.

INTEREST: what a person or group needs or is trying to protect in the scenario: the family's faith and timeline, the public's need for the truth, the examiner's duty.

DECIDING PRINCIPLE: the one rule you apply when interests conflict, stated so that someone who disagrees can still see how you got there.

SIDE	THEIR INTEREST, IN ONE SENTENCE	THEIR STRONGEST ARGUMENT, STATED FAIRLY	ACCOMMODATION THAT WOULD HELP THEM
The family			
The examiner			
The public (or the law)			

PBS-U1-
D11-B1

☐

Interests table complete: three sides, an interest, a fair argument, and an accommodation for each. (Scored on the table.)

PBS-U1-
D11-B2

☐

List three accommodations an examiner can offer an objecting family, and say which of them still lets the question in doubt be answered.

PBS-U1-
D11-B3

☐

Your ruling in one sentence, and the deciding principle in one sentence. Then the strongest argument against your ruling, stated the way its best defender would say it.

PART C · WRITE THE CALL

SEC 03

Write the review board's decision memo: the ruling, the deciding principle, the accommodation ordered, the strongest opposing argument and why it did not win, and one sentence on what would change your mind. Five to seven sentences, respectful of every person in the scenario.

Claim ceiling. This is a reasoning exercise on a fictional scenario. Real cases involve real law, real faith, and real families; our ruling binds nobody.

PBS-U1-
D11-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D11-D1

☐

Use **autopsy** and **jurisdiction** and **accommodation** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D11-E1

☐

When can an examination legally proceed without family consent?

PBS-U1-
D11-E2

☐

Name two accommodations an examiner can offer an objecting family.

PBS-U1-
D11-E3

☐

What makes a position slip complete?

TURN IN

SLIP

Ethics position slip: Ruling with deciding principle; Strongest opposing argument, stated fairly; Accommodation ordered.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 1.3 Business Ethics and Law.

Ohio Health Science	1.3.3	Use ethical character traits consistent with workplace standards (e.g., honesty, personal integrity, compassion, justice).
Ohio Health Science	6.2.4	Identify what constitutes the authorized access, release and use of personal health information.
Ohio Health Science	2.2.1	Provide privacy and demonstrate sensitivity for diverse populations.
Ohio Health Science	1.5.3	Use cultural intelligence to interact with individuals from diverse cultural settings.
Ohio Health Science	1.2.7	Use problem-solving and consensus-building techniques to draw conclusions and determine next steps.
PLTW PBS framework	ERM-A.7	Weigh the ethical implications of biomedical science decisions.
PLTW PBS framework	ERM-A.8	Summarize and explain the larger ethical, moral, and legal issues related to scientific research, product development, and use in society (animal use/human research).
PLTW PBS framework	COM-A.2	Modify communications to meet the needs of the audience or patient.
Common Core	RST.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or recommendation.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D11-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.11a	Explain who may order an examination and why the law makes some deaths a public matter	items A1, B1, E1
PBS.S.11b	Name the interests on each side of an ethics scenario and the accommodations available	items B2, E2
PBS.S.11c	State the strongest opposing argument fairly and apply a deciding principle	items B3, C1, E3
PBS.S.11d	Use autopsy, jurisdiction, and accommodation correctly	items A2, D1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 21 OF 28 Thu, Sep 24 about 80 minutes**Investigation Day 12: The Clock in the Body**

Today we need to accomplish run the external examination and estimate time of death from three body clocks: cooling, stiffening, and blood settling.

Our goal is relate organ systems to tissue types and prepare for the PLTW morgue task.

You have to turn in Exit ticket: name all four tissue types, one identifying structural feature of each, and one organ that contains each type. Hand in your exit ticket before leaving class.

Schoology assignment: Wk5 D12 · The Clock in the Body

1
READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D12 Case A briefing pack (read this)** (5 pages); then **D12 Case A Daily Evidence Sheet (write on this)** (10 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2
DO

Take notes on the four primary tissue types and their functions.

3
DO

Map two organ systems to the tissues that build them.

HINT Three independent clocks, one window. When independent estimates agree, confidence is earned, not assumed.

4
CHECK

Review how a pathologist links tissue damage to cause of death.

5
WRITE

Complete the PLTW master-the-morgue online task on body systems.

6
DO

Note the observation variables you will record during microscopy.

7
CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8
TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk5 D12 · The Clock in the Body**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D12
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 25 · Investigation Day 12 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that an autopsy is the last physical exam, performed for the living as much as the dead: it answers the questions the body can still answer.

Real examiners estimate the time of death from three separate body clocks, how far it has cooled, how stiff it has become, and where the blood has settled, and they trust the window only where the three clocks agree. Today you read those same three clocks and state honestly what they cannot tell you.

OBJECTIVE

Today you will run the external examination and estimate time of death from three body clocks: cooling, stiffening, and blood settling.

Take-home (the ten-year idea): Three independent clocks, one window. When independent estimates agree, confidence is earned, not assumed.

CASE FILE UPDATE

SEC 01

External exam and the three body clocks. And the records pull arrives: the door access log, which has one strange row in it.

After death, the body changes on schedules, and schedules can be read backward. **ALGOR MORTIS**: the body cools from its normal living temperature (about 37 degrees C, 98.6 degrees F) toward room temperature, roughly 1 to 1.5 degrees C per hour early on (this course's working rule; real examiners use tables that adjust for body size, clothing, and the room). So the math is: (normal 37 minus the measured temperature) divided by the cooling rate gives roughly how many hours since death. Analogy: the coffee cup; touch it and you know roughly when it was poured. **LIMIT**: the room writes the schedule too: a warm room, clothing, or body size all bend the curve, so every algor estimate carries its assumptions, starting with that 37 degree normal.

RIGOR MORTIS: muscles stiffen as their chemistry runs down, beginning in small muscles within a few hours, peaking around 12, releasing over the next day. It is a timer you read backward from stiffness distribution. **LIMIT**: temperature and exertion before death shift it.

LIVOR MORTIS: blood settles to the lowest surfaces, showing as fixed purple discoloration after several hours. Livor tells time AND position: if the settled pattern does not match the found position, the body was moved, and that is a case-changing fact. **LIMIT**: dark skin tones and pressure points complicate the read.

The method: estimate a window from each clock separately, then intersect the windows. Independent agreement is the day's big idea, the same one that will close the whole case: one clock persuades, three clocks corroborate.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
algor mortis	body cooling after death, roughly on a schedule	the coffee cup cooling
rigor mortis	temporary muscle stiffening after death, comes and goes on a schedule	a timer you read backward
livor mortis	blood settling to the lowest points after death, fixed after hours	sediment settling in a bottle

YOUR ROLE

Team E leads; all teams compute.

THE SITUATION

The time-of-death worksheet in this pack carries the case's measured values: temperatures, stiffness observations, lividity pattern, plus the scene's ambient conditions.

THE RULE YOU APPLY

One window per clock, assumptions stated, then intersect. The final window is only as tight as the assumptions are honest.

WHAT YOU PRODUCE

Time-of-death worksheet: three windows with stated assumptions, the intersection, and one sentence on which clock you trust least here and why.

Claim ceiling. The window is an estimate with stated assumptions, not a fact. It constrains the timeline; it does not convict anyone inside it.

WHAT THIS UNLOCKS

Tomorrow: the full examination. Your window meets the door log tonight; check the timeline.

Activities 1.2.1 Anatomy of an Autopsy + 1.2.2 Time of Death (referenced by title only; all materials in this file are John

Hay original work)

- **Vital Signs simulation** mendozabiomed.org/learn/lab-sim/pbs-vital-signs
- Portal: Vital Signs simulation (baseline concepts), day page, guided notes

Hand out only the exhibits listed for this day.

EXHIBIT 014 · Records thread

RELEASED DAY 12

Door access log, weekend (SIMULATED)

DOOR ACCESS LOG

Electronic fob and key-code record

TIME STAMP	EVENT	CREDENTIAL
FRI 9:02 PM	Cole fob OUT	T. Cole
SAT 2:15 PM	Bell fob IN	M. Bell
SUN 3:00 AM	DOOR HELD alarm	(no fob)
MON 7:38 AM	Cole fob IN	T. Cole
MON 7:40 AM	911 call placed	

Bell entered alone Saturday 2:15 PM; no fob entry follows until Monday. The 3:00 AM DOOR HELD row is explained by the HVAC maintenance. **SIMULATED**

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Document the external exam demonstration; photo-log references.

B Trace

Compute the rigor window; state assumptions.

C Serology and DNA

Compute the algor window; state assumptions.

D Toxicology and Chemistry

Compute a second algor window with a different assumed start temperature; brief the difference.

E Medical Examiner

Lead the worksheet. Body at room temperature + rigor passed + livor fixed: each clock gives a window; intersect them. Expected honest answer: death occurred at least a day or more before discovery; the clocks cannot pin an hour this late, and SAYING so is the correct finding.

F Records and Timeline

Door log to the timeline: Bell entered alone Sat 2:15 PM and no fob entry follows. Flag the 3:00 AM DOOR HELD row as an open question, not a conclusion.

- Time-of-death worksheet organizer
- Manner-of-death logic tree (opens today, all branches live)
- Day 12 Cornell page

DAILY SUBMISSION FORM: TIME-OF-DEATH WORKSHEET

JH-26-0831-A / D12

- ☐ Three windows with assumptions
- ☐ Intersection window
- ☐ Least-trusted clock sentence

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D12-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 25 · Investigation Day 12 of 18 · The Clock in the Body

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOMES 5.8 AND 2.1

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 25, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real examiners estimate the time of death from three separate body clocks, how far it has cooled, how stiff it has become, and where the blood has settled, and they trust the window only where the three clocks agree. Today you read those same three clocks and state honestly what they cannot tell you.

Today you will: run the external examination and estimate time of death from three body clocks: cooling, stiffening, and blood settling.

The ten-year idea: Three independent clocks, one window. When independent estimates agree, confidence is earned, not assumed.

ALGOR MORTIS: body cooling after death, roughly on a schedule. Analogy to hold onto: the coffee cup cooling.

RIGOR MORTIS: temporary muscle stiffening after death, comes and goes on a schedule. Analogy to hold onto: a timer you read backward.

LIVOR MORTIS: blood settling to the lowest points after death, fixed after hours. Analogy to hold onto: sediment settling in a bottle.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

After death, the body changes on schedules, and schedules can be read backward. **ALGOR MORTIS:** the body cools from its normal living temperature (about 37 degrees C, 98.6 degrees F) toward room temperature, roughly 1 to 1.5 degrees C per hour early on (this course's working rule; real examiners use tables that adjust for body size, clothing, and the room). So the math is: (normal 37 minus the measured temperature) divided by the cooling rate

gives roughly how many hours since death. Analogy: the coffee cup; touch it and you know roughly when it was poured. LIMIT: the room writes the schedule too: a warm room, clothing, or body size all bend the curve, so every algor estimate carries its assumptions, starting with that 37 degree normal.

RIGOR MORTIS: muscles stiffen as their chemistry runs down, beginning in small muscles within a few hours, peaking around 12, releasing over the next day. It is a timer you read backward from stiffness distribution. LIMIT: temperature and exertion before death shift it.

LIVOR MORTIS: blood settles to the lowest surfaces, showing as fixed purple discoloration after several hours. Livor tells time AND position: if the settled pattern does not match the found position, the body was moved, and that is a case-changing fact. LIMIT: dark skin tones and pressure points complicate the read.

The method: estimate a window from each clock separately, then intersect the windows. Independent agreement is the day's big idea, the same one that will close the whole case: one clock persuades, three clocks corroborate.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D12-A1

The reading gives a cooling rate for the body after death. What is it, and what starting temperature does it assume? Copy the first three words of the sentence you used.

PBS-U1-
D12-A2

The reading says lividity tells time AND position. What would a mismatch between the settled pattern and the found position mean?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Three clocks, three windows, one intersection (practice values, not the case)

A practice worksheet: a body measured at 10:00 PM reads 33.0 degrees C in a 20 degree C room, stiffness is present only in the jaw and fingers, and the settled blood fades when pressed.



What to notice: Notice the two thermometers: every cooling estimate needs both numbers, the body's and the room's, and the room's is the one people forget to write down.

1. Step 1. Algor, the drop: normal 37 minus measured 33.0 = 4.0 degrees C dropped. Write the unit every time.
2. Step 2. Algor, the two rates: at 1 degree C per hour, 4.0 divided by 1 = 4.0 hours. At 1.5 degrees C per hour, 4.0 divided by 1.5 = about 2.7 hours. Window: 2.7 to 4.0 hours before 10:00 PM, which is about 6:00 PM to 7:20 PM. Assumption: the person started at 37 and the room stayed at 20.
3. Step 3. Rigor: stiffness in small muscles only means the clock is in its first few hours. Window: under about 4 hours, so after about 6:00 PM. Assumption: normal temperature and no hard exertion before death.
4. Step 4. Livor: blood settled but fades when pressed means not fixed, so under several hours, call it under 8. Window: after about 2:00 PM. Assumption: a light skin tone and no pressure points hiding the pattern. Also check position: the settled blood is on the surfaces that were lowest in the found position, so nothing says moved.
5. Step 5. Intersect: time inside every window. Algor says 6:00 to 7:20 PM, rigor says after 6:00 PM, livor says after 2:00 PM. Overlap: about 6:00 to 7:20 PM. Algor set both ends; the other two agreed and did not narrow it.
6. Step 6. Name the least-trusted clock and why: livor, because 'fades when pressed' is a soft yes-or-no read with a wide schedule. Then the conversion: 33.0 times 1.8 = 59.4, plus 32 = 91.4 degrees F.

Finished product: Practice window: death about 6:00 to 7:20 PM (2.7 to 4.0 hours before the 10:00 PM reading), with the 37 degree start as the load-bearing assumption; rigor and livor agree without narrowing it, and 33.0 degrees C is 91.4 degrees F.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

In class, Team E led the external exam demonstration at the scene model and every team worked the time-of-death worksheet values below, one clock per pair, then intersected the windows. The door access log (DOC-6) also landed. All values are simulated and printed on the worksheet.

When and where measured	Body temperature taken at discovery, Monday 7:55 AM, in the studio. Ambient (room) temperature 21 degrees C, steady all weekend, HVAC (the building's heating and cooling system) on.
Algor mortis measurement	Body temperature 21.8 degrees C. That is 0.8 degrees C above the room, so the body has reached room temperature: the cooling clock has run out.
Algor arithmetic with units	37 minus 21.8 = 15.2 degrees C dropped. At 1.5 degrees C per hour: 15.2 divided by 1.5 = about 10.1 hours. At 1 degree C per hour: 15.2 hours. But once a body matches the room it stops cooling, so the honest window is AT LEAST 10 to 15 hours, with no upper limit from this clock. Assumption: a 37 degree start and a steady 21 degree room; the acoustic blanket over the lower body slows cooling and makes the true time longer, not shorter.
Rigor mortis observation	Fully passed: no stiffness anywhere. The worksheet schedule: stiffening begins in small muscles within a few hours, peaks around 12 hours, releases over the next day. Fully passed means roughly 24 to 36 hours or more before the 7:55 AM check. Assumption: normal temperature and no heavy exertion before death, both of which shift the schedule.
Livor mortis observation	Fixed (does not fade when pressed), on the anterior (front) surfaces, which matches the prone (face-down) found position. Fixed livor means several hours or more since death, at least about 8 to 12 on most schedules; this clock gives a floor, not a ceiling. Position reading: the pattern matches the found position, so nothing here says the body was moved.
Intersection a team reached	All three clocks agree only on a floor: death at least about a day before Monday morning discovery, so no later than Sunday morning. None of the three can pin an hour this late, and saying so is the correct finding.
Least-trusted clock a team named (Part B2)	Algor, because the body is within 1 degree of the room (the clock has run out) and the blanket covering part of the body bends the cooling curve. Rigor is a close second: fully passed is a one-word observation with a wide schedule behind it.
Door access log DOC-6 (exhibit a12), for the timeline check	Friday 9:02 PM: Cole fob OUT. Saturday 2:15 PM: Bell fob IN. Sunday 3:00 AM: DOOR HELD alarm, no fob. Monday 7:38 AM: Cole fob IN. Monday 7:40 AM: 911 call placed. No other entries all weekend. The 3:00 AM row is logged as an OPEN QUESTION, not a conclusion.
Extra conversion practice on the case value (item B3 uses 30.5 C, which is 86.9 F)	21.8 degrees C to Fahrenheit: 21.8 times 1.8 = 39.24, plus 32 = 71.2 degrees F (the room, 21 C, is 69.8 F).

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

Fill one row per clock from today's time-of-death worksheet. Each window needs its assumption written down; the final window is only as tight as the assumptions are honest.

WINDOW: the earliest and latest time a clock allows. A single number pretends to a precision no clock has.

INTERSECTION: the overlap of all the windows. Time inside every window is possible; time outside any one window is ruled out by that clock.

CLOCK	MEASUREMENT YOU USED	WINDOW (EARLIEST TO LATEST HOURS SINCE DEATH)	THE ASSUMPTION THAT COULD THROW IT OFF
Algor mortis (cooling)			
Rigor mortis (stiffening)			
Livor mortis (settling)			
Intersection of all three			

PBS-U1-
D12-B1

☐

Windows table complete: three clocks, three windows with units, three assumptions, and the intersection. (Scored on the table.)

PBS-U1-
D12-B2

☐

Which clock do you trust least in this case, and why? Name the specific condition at the scene that weakens it.

PBS-U1-
D12-B3

☐

Practice numbers (not from the case). A body measures 30.5 degrees C in a normal room. Normal living temperature is 37 degrees C. How many degrees has it dropped? At 1 degree per hour, how many hours? At 1.5 degrees per hour? Write the window those two rates give. Then convert 30.5 degrees C to Fahrenheit (multiply by 1.8, add 32).

Write the time-of-death paragraph for the timeline. Include: the three windows in one sentence each with their assumption, the intersection, the least-trusted clock and why, and what the window does to any person of interest whose whereabouts are known for part of it. Stay inside the ceiling: the window constrains, it does not convict.

Claim ceiling. The window is an estimate with stated assumptions, not a fact. It constrains the timeline; it does not convict anyone inside it.

PBS-U1-
D12-C1

☐

Your writing:

PBS-U1-
D12-D1

☐

Use **algor mortis** and **rigor mortis** and **livor mortis** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D12-E1

☐

Body temperature 8 degrees C below normal in a normal room. Rough time estimate and its biggest assumption?

PBS-U1-
D12-E2

☐

Livor pattern fixed on the back, body found face down. Meaning?

PBS-U1-
D12-E3



Why intersect three windows instead of trusting the tightest one?

TURN IN

SLIP

Time-of-death worksheet: Three windows with assumptions; Intersection window; Least-trusted clock sentence.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: Vital Signs simulation at mendozabiomed.org/learn/lab-sim/pbs-vital-signs.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	2.1.14	Describe the difference between pathology and physiology and the conditions typically observed during a disease state.
Ohio Health Science	2.1.15	Explain the pathophysiology changes associated with or resulting from disease or injury for each body system.
Ohio Health Science	5.8.8	Compute measures of central tendency and dispersion to interpret results and draw conclusions.
Ohio Health Science	5.8.9	Describe the relationships between variables using correlations and draw conclusions.
Ohio Health Science	5.2.18	Convert units of measure from English to metric and vice versa.
PLTW PBS framework	ANP-A.2	Understand that interactions between internal and external sources can affect body systems and cell functions.
PLTW PBS framework	EXD-B.3	Perform necessary calculations to analyze experimental data.
PLTW PBS framework	CCP-B.1	Use mathematical computations to interpret data.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	HSS-ID.C.7	Interpret the slope (rate of change) and the intercept of a linear model in the context of the data.
Common Core	HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
NGSS	SEP-5	Using mathematics and computational thinking: use mathematical representations to describe and support explanations and predictions.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D12-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.12a	Explain each body clock and the assumption that can throw it off	items A1, A2, E1
PBS.S.12b	Estimate a time window from a rate and state the assumption	items B1, B3
PBS.S.12c	Intersect independent windows and say why agreement earns confidence	items B2, E3, C1
PBS.S.12d	Read a lividity pattern against the found position	items E2, D1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 22 OF 28 Thu, Sep 24 about 45 minutes**John Carroll bioethics debate 1: should ELISA testing be mandatory?**

Today we need to accomplish debating an assigned side, then writing one CER.

Our goal is answering the other side's best argument, not its weakest.

You have to turn in one CER with five parts, J1 to J5.

Schoology assignment: Wk5 CER: JCU bioethics 1, should ELISA testing be mandatory?

1

READ

First, the scenario and the first argument on each side.

Scenario. A new infectious disease called Novel Flu Syndrome (NFS, made up) spreads with many carriers who have no symptoms, but it causes severe complications in some people, including long-term organ damage. A fast, cheap ELISA detects antibodies to NFS, which shows past or current infection.

The case for: Mandatory testing finds infected people, including carriers with no symptoms, so isolation, contact tracing and treatment can stop the spread.

The case against: Mandatory testing overrides the right to privacy and bodily autonomy. The choice to be tested should belong to the person.

2

WRITE

J1. Your assigned side and its claim in one sentence. **J2.** Your three strongest arguments, each with its source.

Scenario. A new infectious disease called Novel Flu Syndrome (NFS, made up) spreads with many carriers who have no symptoms, but it causes severe complications in some people, including long-term organ damage. A fast, cheap ELISA detects antibodies to NFS, which shows past or current infection.

The case for: Mandatory testing finds infected people, including carriers with no symptoms, so isolation, contact tracing and treatment can stop the spread.

The case against: Mandatory testing overrides the right to privacy and bodily autonomy. The choice to be tested should belong to the person.

HINT A preference is not evidence. Name where each argument comes from.

3

WRITE

J3. Reasoning: which error matters more here, a false positive or a false negative, and who carries that harm? One limit of an antibody test: it shows the immune response, not the germ, and antibodies take days to weeks to appear.

4

WRITE

J4. The other side's strongest point and your answer. **J5.** Where you stand now and one condition that would change your mind.

5

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk5 CER: JCU bioethics 1, should ELISA testing be mandatory?**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 23 OF 28 Fri, Sep 25 about 80 minutes**Investigation Day 13: Autopsy Day**

Today we need to accomplish run the autopsy stations: document findings on the body diagram, read the organ findings, and put your hands (virtually) on the heart's real anatomy.

Our goal is examine histology slides under the microscope and observe gross heart anatomy, recording both on the supplied sheet.

You have to turn in Lab notebook pages: four histology sketches (one per tissue type, magnification labeled, one feature identified), a labeled heart diagram with chambers, valves, and major vessels, and one limitation and one error source noted. Photograph your notebook pages and upload to the tracker before leaving class.

Schoology assignment: Wk5 D13 · Autopsy Day

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D13 Case A briefing pack (read this)** (6 pages); then **D13 Case A Daily Evidence Sheet (write on this)** (9 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

Set the microscope up using the four setup checks on your tissue and heart record, lowest objective first, then focus.

3

DO

Identify epithelial, connective, muscle, and nervous tissue on slides.

HINT A wound that bled tells you the person was alive when it happened. Vital response is the body time-stamping its own injuries.

4

DO

Sketch each tissue with magnification and one identifying feature labeled.

5

DO

Examine a preserved heart and locate chambers, valves, and vessels.

6

WRITE

Record one limitation of slide-based identification and one error source.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk5 D13 · Autopsy Day**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D13
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 28 · Investigation Day 13 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that three independent clocks, one window. When independent estimates agree, confidence is earned, not assumed.

Real autopsies work from the outside in, describe every finding before interpreting it, and read a wound for 'vital response' to tell whether it happened while the person was alive. Today you work the same stations and make the same careful calls.

OBJECTIVE

Today you will run the autopsy stations: document findings on the body diagram, read the organ findings, and put your hands (virtually) on the heart's real anatomy.

Take-home (the ten-year idea): A wound that bled tells you the person was alive when it happened. Vital response is the body time-stamping its own injuries.

CASE FILE UPDATE

SEC 01

Autopsy day. The examiner's findings packet opens, and one more thing: during office inventory, an insulin pen turns up in the studio desk drawer, expired.

An autopsy runs outside-in: external documentation (done yesterday), then systematic internal examination, organ by organ, with every finding described before it is interpreted. Today's packet is the examination record: your job is to read findings the way you read every exhibit: what does it SAY, then what does it MEAN, then what can it NOT mean.

The concept that unlocks today: VITAL RESPONSE. A living body responds to injury: it bleeds into tissue, swells, sends inflammatory cells. A wound inflicted after death shows little bleeding and no tissue reaction. Analogy: only a running engine leaks oil when punctured. So the wound margins carry a time stamp: with vital response, the injury happened in life; without, after death. That one distinction separates 'injured and then died' from 'died and then damaged,' which can separate accident from staging.

The heart station: you cannot judge findings in an organ you have never navigated. The sheep heart simulation walks the real anatomy: four chambers (right atrium, right ventricle, left atrium, left ventricle), the valves between them, the great vessels (the aorta leaving the left ventricle, the pulmonary artery leaving the right), the coronary arteries on the surface that feed the muscle itself. On the glasses station, the Cleveland Clinic anatomy model shows the same structures in three dimensions at the teacher station. What you need for this case is orientation: enough anatomy to read the examiner's findings and know which findings matter.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
vital response	signs a wound happened while the person was alive: swelling, bleeding into tissue	only a running engine leaks oil

YOUR ROLE

Team E leads; stations rotate.

THE SITUATION

The autopsy findings packet (this pack), the body diagram, the heart simulation, and the glasses station.

THE RULE YOU APPLY

Findings transcribe onto the diagram exactly as written; interpretations go in a separate column; every interpretation cites a finding.

WHAT YOU PRODUCE

Autopsy findings sheet: body diagram annotated, organ findings logged, vital-response calls made with reasons, heart station checkpoint complete.

Claim ceiling. Findings support or weaken causes of death; the manner still waits for the full picture. One organ's finding is a voice, not a verdict.

WHAT THIS UNLOCKS

Tomorrow the microscope: tissue-level findings that explain today's organ-level ones.

Activities 1.2.4 Histology + 1.2.5 Gross Anatomy of the Heart (referenced by title only; all materials in this file are John Hay original work)

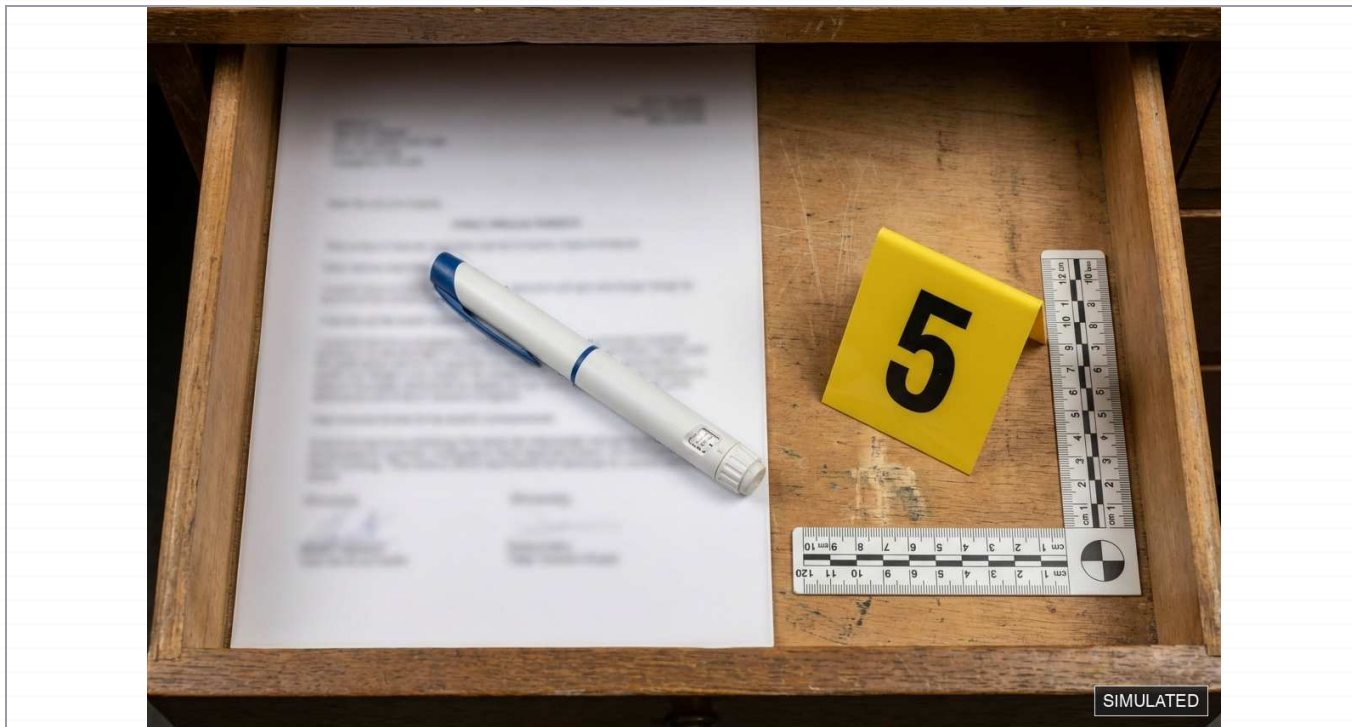
- **Sheep Heart Dissection simulation** mendozabiomed.org/learn/lab-sim/pbs-sheep-heart-dissection
- Portal: Sheep Heart Dissection simulation (station), day page, guided notes; Meta glasses Cleveland Clinic anatomy at the teacher station
- Meta glasses with the Cleveland Clinic anatomy application (teacher station, rotate in pairs), or the portal heart simulation as the open alternative

Hand out only the exhibits listed for this day.

EXHIBIT 015 · Chemistry thread

RELEASED DAY 13

Insulin pen recovered from desk drawer



LAB PROCEDURES FOR TODAY

SEC 08

Follow each illustrated procedure step by step. The full set is in the Lab Manual.

PROCEDURE: WORKING THE AUTOPSY STATIONS

HOW-TO



1. Begin with the external exam and document every finding before anything is disturbed.
2. Work outside-in, organ by organ, describing each finding before interpreting it.
3. Write findings (what is SEEN) in one column and interpretations (what it MEANS) in a separate column, never mixed.
4. For every wound, decide vital response: bleeding into the tissue means the injury happened in life.

Safety and honesty: Treat the person as a patient to the end. Every interpretation must cite the finding it rests on.

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Photograph diagrams and station work; log references.

B Trace

Cross-check: do any trace findings sit where the diagram now shows injuries?

C Serology and DNA

Cross-check: do serology locations match the injury map?

D Toxicology and Chemistry

E6 to your thread: an expired, unused insulin pen plus Saturday's meter readings plus the panel. Write the mechanism question this raises (do not answer it yet).

E Medical Examiner

Lead transcription. The paint-transfer laceration WITH vital response: what does each half of that finding time-stamp? No defensive wounds: what does that absence say, and what can it not say?

F Records and Timeline

Timeline: enter medically established events; prune the logic tree with E team.

- Body diagram, front and back
- Logic tree pruning notes
- Day 13 Cornell page

DAILY SUBMISSION FORM: AUTOPSY FINDINGS SHEET

JH-26-0831-A / D13

- ☐ Body diagram annotated
- ☐ Organ findings logged
- ☐ Vital-response calls with reasons
- ☐ Heart checkpoint answers

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 28 · Investigation Day 13 of 18 · Autopsy Day

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOMES 2.1 AND 2.3

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 28, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real autopsies work from the outside in, describe every finding before interpreting it, and read a wound for '**vital response**' to tell whether it happened while the person was alive. Today you work the same stations and make the same careful calls.

Today you will: run the autopsy stations: document findings on the body diagram, read the organ findings, and put your hands (virtually) on the heart's real anatomy.

The ten-year idea: A wound that bled tells you the person was alive when it happened. Vital response is the body time-stamping its own injuries.

VITAL RESPONSE: signs a wound happened while the person was alive: swelling, bleeding into tissue. Analogy to hold onto: only a running engine leaks oil.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

An autopsy runs outside-in: external documentation (done yesterday), then systematic internal examination, organ by organ, with every finding described before it is interpreted. Today's packet is the examination record: your job is to read findings the way you read every exhibit: what does it SAY, then what does it MEAN, then what can it NOT mean.

The concept that unlocks today: **VITAL RESPONSE**. A living body responds to injury: it bleeds into tissue, swells, sends inflammatory cells. A wound inflicted after death shows little bleeding and no tissue reaction. Analogy: only a running engine leaks oil when punctured. So the wound margins carry a time stamp: with vital

response, the injury happened in life; without, after death. That one distinction separates 'injured and then died' from 'died and then damaged,' which can separate accident from staging.

The heart station: you cannot judge findings in an organ you have never navigated. The sheep heart simulation walks the real anatomy: four chambers (right atrium, right ventricle, left atrium, left ventricle), the valves between them, the great vessels (the aorta leaving the left ventricle, the pulmonary artery leaving the right), the coronary arteries on the surface that feed the muscle itself. On the glasses station, the Cleveland Clinic anatomy model shows the same structures in three dimensions at the teacher station. What you need for this case is orientation: enough anatomy to read the examiner's findings and know which findings matter.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D13-A1

☐

The reading says a living body responds to injury in three ways. Name them and copy the first three words of the sentence you used.

PBS-U1-
D13-A2

☐

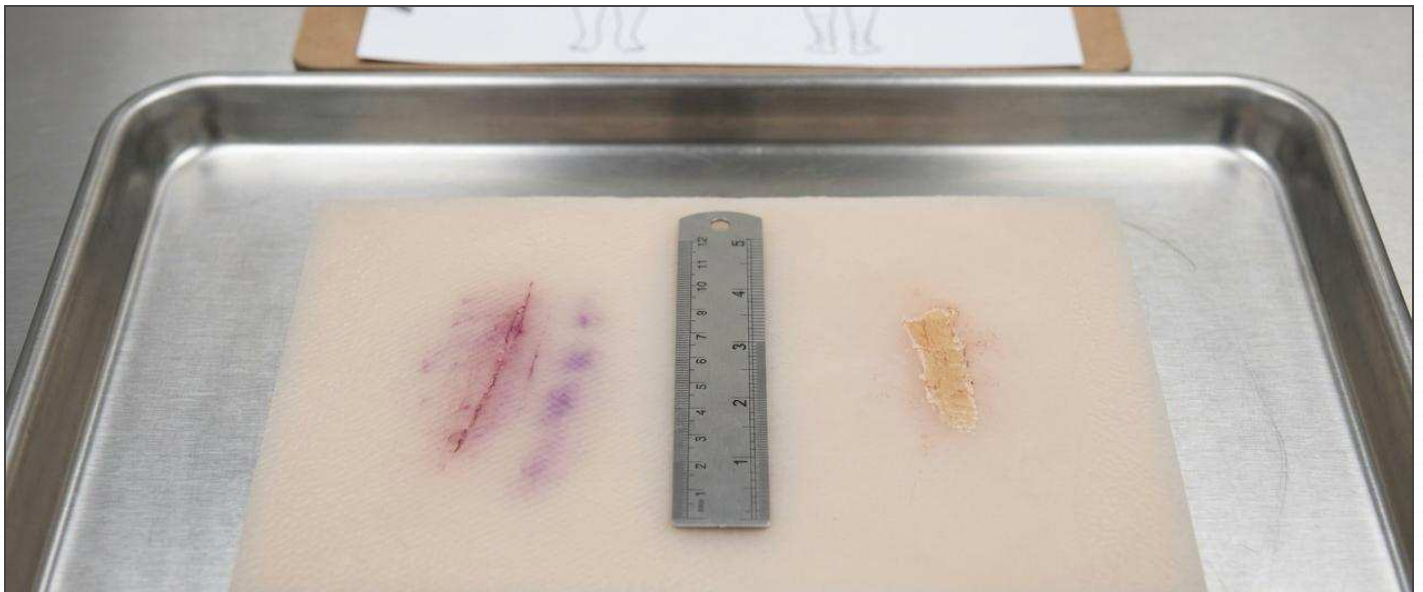
Why does the reading say you cannot judge findings in an organ you have never navigated?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Transcribing a finding, calling vital response, and keeping interpretation in its own column (practice card, not the case)

A training findings card describes a person found at the foot of a stepladder in a garage, with two skin injuries and a heart mass listed.



What to notice: Notice the purple under the left scrape: that is blood that leaked into living tissue, a vital response. A scrape made after death shows no such color change beneath it.

1. Step 1. Region in the diagram's terms, not everyday words. The card says 'left forearm, palm side': write 'left forearm, anterior (front) surface'. The card says 'right shin': write 'right lower leg, anterior surface'.
2. Step 2. Copy each finding word for word into the finding column, no additions. Finding 1: 'Abrasion (a scrape that removes the top skin layer), 4 cm, with bruising in the tissue beneath.' Finding 2: 'Abrasion, 2 cm, pale, with no bleeding into the tissue beneath.'
3. Step 3. Vital response call, with the sign. Finding 1: YES, sign: bruising means blood leaked into living tissue. Finding 2: NO, sign: pale with no bleeding into tissue, the way a scrape looks when the circulation had already stopped.
4. Step 4. Interpretation, in its own column, citing the finding it rests on. For Finding 1: 'Consistent with an injury in life (cites the bruising); does not say how long before death, and does not say it caused death.' For Finding 2: 'Consistent with an injury after death, for example during moving by responders (cites the pale, bloodless margin); does not say who or how.'
5. Step 5. The heart line on the card: heart mass 330 g in a 55 kg person. Convert kilograms to grams first: 55 times 1,000 = 55,000 g. Then 330 divided by 55,000 = 0.006 = 0.6 percent of body mass. Write it in the finding column as a number, not as 'normal' or 'enlarged'; that judgment needs a reference range you were not given.
6. Step 6. Read the columns back: every finding is verbatim, every call has a sign, every interpretation names its finding, and nothing in the table says how the person died. That last check is the ceiling.

Finished product: Finding 1 (left forearm abrasion with bruising) shows vital response, so it happened in life; Finding 2 (pale right lower leg abrasion, no bleeding) does not, so it is consistent with an injury after death. The 330 g heart in a 55 kg person is 0.6 percent of body mass, a number logged without a judgment.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

In class, the autopsy findings packet (E11) opened and teams rotated through four stations: transcribing findings onto the body diagram, the sheep heart simulation, the anatomy glasses station, and vital-response calls. During office inventory an insulin pen (E6) also turned up. Copy findings exactly as written; interpretations go in their own column.

BODY REGION (DIAGRAM TERM)	FINDING, EXACTLY AS WRITTEN IN THE PACKET	VITAL RESPONSE? (SIGN)	INTERPRETATION A TEAM WROTE, CITING THE FINDING
Scalp, right temporal region (the side of the head above and in front of the ear)	Right temporal scalp laceration, 3.1 cm, with paint transfer consistent with the console- corner finish; bleeding into surrounding tissue at the wound margin.	Yes (bleeding into surrounding tissue)	Consistent with striking the console corner while alive (paint transfer plus vital response). Does not say how long before death, or whether it caused death.
Skull and brain (inside the head)	No skull fracture, no bleeding inside the skull.	Not applicable (no injury found)	Weakens any idea that the head wound was a deep or fatal blow; the wound is a surface injury.
Hands and forearms	No defensive wounds on hands or forearms.	Not applicable (no injury found)	No evidence of fending off a person; cannot prove nobody was present.
Brain	Mild generalized brain swelling (edema), noted as nonspecific and NOT from the surface head wound.	Cannot tell (not a wound)	Nonspecific: many kinds of death show it. Logged as nonspecific, points nowhere on its own.
Lungs	Lungs congested (heavy with fluid), a nonspecific finding.	Cannot tell (not a wound)	Nonspecific; logged as such.
Pancreas	Grossly unremarkable, histology pending.	Cannot tell	Nothing to interpret until the slides (tomorrow).

Words in the packet, defined	Laceration: a tear in the skin from a blunt edge. Paint transfer: flecks of the console's finish left in the wound, tying the wound to that object. Edema: swelling from fluid where it should not be. Congested: heavy with blood or fluid. Grossly unremarkable: normal to the naked eye, before the microscope. Nonspecific: a finding many different deaths share, so it points to none of them by itself. Defensive wounds: cuts or bruises on the hands and forearms from blocking a blow.
Exhibit E6 (exhibit a06), found at inventory	An insulin pen in the studio desk drawer: seal intact, never used, expiration date five months before the weekend. It matches the Day 4 background card's lapsed prescription. Team D's job today was to write the question this raises next to the Day 9 meter readings and the Day 10 panel, not to answer it.
Heart checkpoint (sheet Part B3, same for both cases)	Path of blood: right atrium, right ventricle, lungs, left atrium, left ventricle, aorta. Practice mass: $70 \text{ kg} = 70,000 \text{ g}$; $350 \text{ divided by } 70,000 = 0.005 = 0.5 \text{ percent of body mass}$.
Three findings a team picked for Part C	The temporal laceration (vital response yes), the absence of skull fracture or bleeding inside the skull, and the absence of defensive wounds; each interpretation cites its finding; the manner is left open.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Work from the autopsy findings packet and the heart simulation. Findings go in the finding column exactly as written; anything you add goes in the interpretation column and cites the finding it rests on.

FINDING: what the examiner saw, measured, or weighed, written before any meaning is attached.

INTERPRETATION: what a finding might mean. It lives in its own column and always names the finding it rests on.

BODY REGION (USE THE DIAGRAM'S TERMS)	FINDING, EXACTLY AS WRITTEN IN THE PACKET	VITAL RESPONSE PRESENT? (YES, NO, CANNOT TELL) AND THE SIGN	INTERPRETATION, CITING THE FINDING

PBS-U1-
D13-B1

☐

Findings table complete: regions named with anatomical terms, findings verbatim, vital-response calls with a sign, interpretations citing findings. (Scored on the table.)

PBS-U1-
D13-B2

☐

Pick one finding with vital response present. What does that time-stamp, and what does it still not tell you?

PBS-U1-
D13-B3

☐

Heart checkpoint. In order, list the path of blood from the body back to the body through the heart: the two chambers on the right, the lungs, the two chambers on the left, and the vessel that leaves the heart. Then the practice number: a heart of 350 grams in a person of 70 kilograms is what percent of body mass? (Convert kilograms to grams first.)

PART C · WRITE THE CALL

SEC 03

Write the examination summary for the case conference: the three findings that matter most today, each with its vital-response call, one interpretation per finding that cites it, and the sentence that keeps the manner open. Plain words; anatomical terms where the diagram uses them.

Claim ceiling. Findings support or weaken causes of death; the manner still waits for the full picture. One organ's finding is a voice, not a verdict.

PBS-U1-
D13-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D13-D1

☐

Use **vital response** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D13-E1

☐

A laceration shows bleeding into surrounding tissue. What does that time-stamp?

PBS-U1-
D13-E2

☐

Why learn heart anatomy to read an autopsy report?

PBS-U1-
D13-E3

☐

Findings column vs interpretation column: why keep them apart?

TURN IN

SLIP

Autopsy findings sheet: Body diagram annotated; Organ findings logged; Vital-response calls with reasons; Heart checkpoint answers.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: Sheep Heart Dissection simulation at mendozabiomed.org/learn/lab-sim/pbs-sheep-heart-dissection.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	2.1.1	Identify body planes, directions, cavities, quadrants, and regions.
Ohio Health Science	2.1.3	Describe the structures and functions of the cardiovascular system and trace the path of blood and identify factors affecting blood flow
Ohio Health Science	2.1.14	Describe the difference between pathology and physiology and the conditions typically observed during a disease state.
Ohio Health Science	2.3.1	Build and decipher medical term meanings by identifying and using word elements (e.g., word roots, prefixes, suffixes, combining forms).
PLTW PBS framework	ANP-A.3	Explain how organ anatomy (such as that of the heart or brain) is related to function.
PLTW PBS framework	ANP-A.4	Demonstrate how a change in structure in the body impacts function.
PLTW PBS framework	EXD-A.4	Maintain a detailed repeatable account of an experiment in a physical or digital laboratory notebook.
Common Core	RST.9-10.4	Determine the meaning of symbols, key terms, and domain-specific words as used in a scientific or technical context.
Common Core	WHST.9-10.2	Write informative or explanatory texts, including scientific procedures and technical processes, with precise language and domain-specific vocabulary.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-6	Constructing explanations: construct an explanation based on valid and reliable evidence.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D13-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.13a	Explain vital response and use it to time-stamp an injury	items A1, B2, E1, D1
PBS.S.13b	Transcribe findings to the body diagram and keep interpretations in their own column	items B1, E3
PBS.S.13c	Name the heart's chambers, valves, and vessels and trace the path of blood	items A2, B3, E2
PBS.S.13d	Write a finding that cites its evidence and stays inside the ceiling	items C1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 24 OF 28 Mon, Sep 28 about 80 minutes**Investigation Day 14: The Fabric Under the Lens**

Today we need to accomplish read the case's tissue slides: learn the four tissue families, then make the histology calls that explain yesterday's organ findings.

Our goal is interpret tissue and heart observations with a CER and evaluate identification limits.

You have to turn in CER arguing what tissue damage could indicate as a cause of death, using the microscopy observations from last class as evidence and referencing a comparison to normal histology in the reasoning. Upload your CER and annotated notebook page to the tracker by end of class.

Schoology assignment: Wk5 D14 · The Fabric Under the Lens

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D14 Case A briefing pack (read this)** (7 pages); then **D14 Case A Daily Evidence Sheet (write on this)** (8 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

CHECK

Compare your tissue sketches to reference histology images.

3

WRITE

Write a CER: what tissue damage could indicate cause of death?

HINT Organs are built from four tissue families. Disease and injury change the weave, and the microscope reads the weave.

4

DO

Relate one tissue finding to a possible pathology.

5

DO

Identify two variables that affect slide interpretation.

6

WRITE

State one limitation of microscopy for determining cause of death.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk5 D14 · The Fabric Under the Lens**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Sep 29 · Investigation Day 14 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that a wound that bled tells you the person was alive when it happened. Vital response is the body time-stamping its own injuries.

Real pathologists put tissue under a microscope to name the process behind an organ finding, because the weave of the tissue tells a truth the naked eye misses. Today you read the case slides the same way: describe, name the pattern, then connect it to the finding it explains.

OBJECTIVE

Today you will read the case's tissue slides: learn the four tissue families, then make the histology calls that explain yesterday's organ findings.

Take-home (the ten-year idea): Organs are built from four tissue families. Disease and injury change the weave, and the microscope reads the weave.

CASE FILE UPDATE

SEC 01

The histology slides come back and the mechanism gets its name.

Every organ in the body is woven from four tissue families: EPITHELIAL (covering and lining sheets), CONNECTIVE (support and transport: bone, blood, the fibrous packing), MUSCLE (contraction), NERVOUS (signaling). Analogy: check the fabric, not just the shirt: two shirts can look alike on the rack while one is cotton and one is polyester; the weave tells the truth. LIMIT: real slides mix families in one field, and staining quality varies; histologists read patterns, not single cells.

What changes under the lens in disease and injury: fluid where it should not be (edema: a waterlogged sponge look, widened spaces), inflammatory cells arriving (small dark nuclei crowding in: the body's response crew on site), tissue architecture collapsing or scarring. Each is a mechanism footprint. Yesterday's organ findings said WHERE; today's slides say WHAT PROCESS.

The case slides in this pack were selected by the examiner to answer the open questions from day 13. Your call sheet works like every comparison so far: describe the field first (what you SEE), then name the pattern (what it MATCHES), then connect it to the finding it explains (what it MEANS for the cause tree). Name first and you start seeing what the name predicts. Three columns, same discipline as day one.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
histology	reading tissue under a microscope	checking the fabric weave, not just the shirt
edema	swelling from fluid where it should not be	a waterlogged sponge

YOUR ROLE

Team E leads; everyone reads.

THE SITUATION

The case slide set (printed micrograph cards with magnification noted) plus reference cards for healthy tissue of each family.

THE RULE YOU APPLY

Describe before naming; name before connecting. Every call cites a visible feature, and reference cards stay on the table.

WHAT YOU PRODUCE

Histology call sheet: per slide, the description, the pattern call, and the cause-tree connection.

Claim ceiling. Tissue findings support mechanisms; they do not name manners. The tree prunes further today, but it does not resolve.

WHAT THIS UNLOCKS

The evidence phase is complete. What remains is reasoning: the synthesis days.

Activity 1.2.4 Histology (referenced by title only; all materials in this file are John Hay original work)

- **Histology: Four Tissue Types simulation** mendozabiomed.org/learn/lab-sim/pbs-histology-four-tissue
- Portal: Histology Four Tissue Types simulation (pre-lab gate), day page, guided notes

Hand out only the exhibits listed for this day.

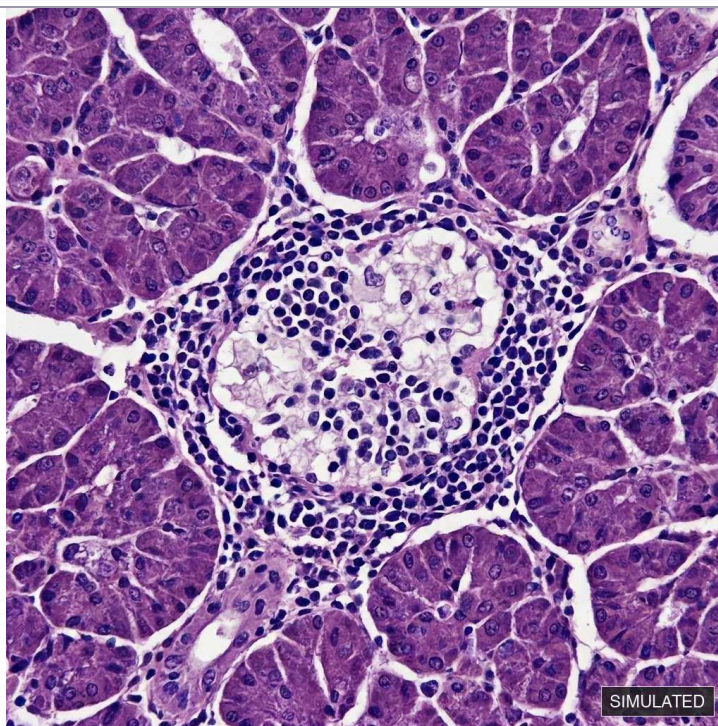
EXHIBIT 016 · Medical thread

RELEASED DAY 14

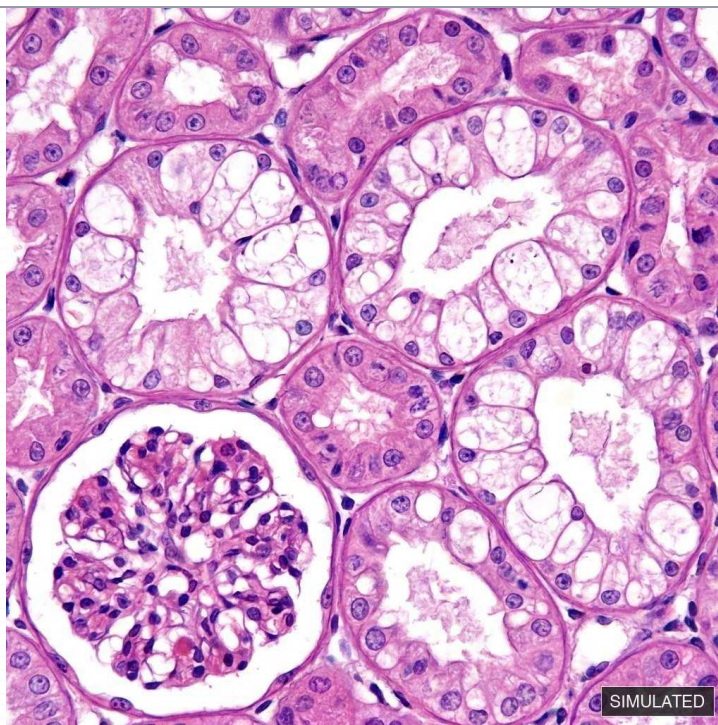
Reference slide: healthy pancreatic islet (200x)



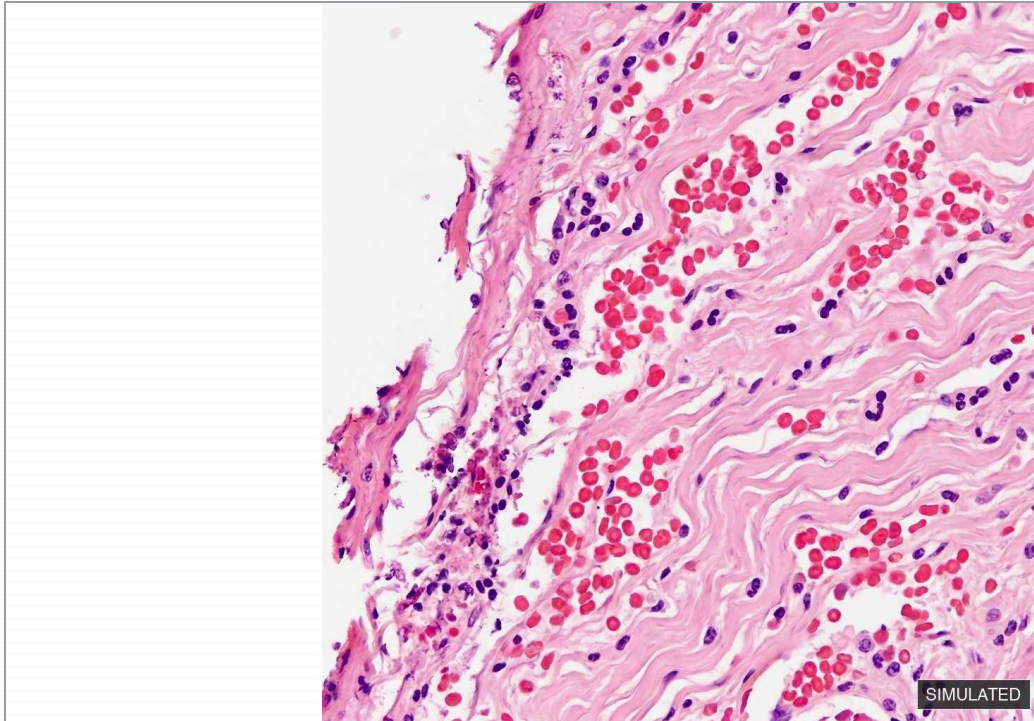
Case slide: Pancreatic islet crowded by immune cells: the autoimmune attack that destroys insulin-making beta cells in type 1 diabetes. (200x)



Case slide: kidney, osmotic change (100x)



Case slide: wound margin, vital response (200x)

**INVESTIGATION TEAM ASSIGNMENTS****SEC 05****A Scene and Documentation**

Log the slide set into the evidence log; reference numbers on every call sheet.

B Trace

Read the trace-relevant slide (wound margin) and brief it.

C Serology and DNA

Read the serology-relevant slide and brief it.

D Toxicology and Chemistry

Connect slide 1 to your thread: destroyed insulin-producing cells + an unused expired pen + 612 glucose + ketones. Write the mechanism chain in plain English for the conference.

E Medical Examiner

Lead the reads. Slide 1 against the healthy reference is the case: describe, name, connect.

F Records and Timeline

Tree bookkeeping: surviving branches and the evidence that would separate them.

- Histology call cards organizer
- Logic tree update
- Day 14 Cornell page

DAILY SUBMISSION FORM: HISTOLOGY CALL SHEET

JH-26-0831-A / D14

- ☐ Per-slide: description, pattern, connection
- ☐ Logic tree pruning noted
- ☐ One remaining open question

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D14-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Sep 29 · Investigation Day 14 of 18 · The Fabric Under the Lens

OFFICIAL

WEBXAM · DOMAIN 1 HANDLING, PREPARATION, STORAGE AND DISPOSAL · OHIO OUTCOMES 5.5 AND 2.1

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Sep 29, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real pathologists put tissue under a microscope to name the process behind an organ finding, because the weave of the tissue tells a truth the naked eye misses. Today you read the case slides the same way: describe, name the pattern, then connect it to the finding it explains.

Today you will: read the case's tissue slides: learn the four tissue families, then make the **histology** calls that explain yesterday's organ findings.

The ten-year idea: Organs are built from four tissue families. Disease and injury change the weave, and the microscope reads the weave.

HISTOLOGY: reading tissue under a microscope. Analogy to hold onto: checking the fabric weave, not just the shirt.

EDEMA: swelling from fluid where it should not be. Analogy to hold onto: a waterlogged sponge.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Every organ in the body is woven from four tissue families: EPITHELIAL (covering and lining sheets), CONNECTIVE (support and transport: bone, blood, the fibrous packing), MUSCLE (contraction), NERVOUS (signaling). Analogy: check the fabric, not just the shirt: two shirts can look alike on the rack while one is cotton and one is polyester; the weave tells the truth. LIMIT: real slides mix families in one field, and staining quality varies; histologists read patterns, not single cells.

What changes under the lens in disease and injury: fluid where it should not be (**edema**: a waterlogged sponge look, widened spaces), inflammatory cells arriving (small dark nuclei crowding in: the body's response crew on

site), tissue architecture collapsing or scarring. Each is a mechanism footprint. Yesterday's organ findings said WHERE; today's slides say WHAT PROCESS.

The case slides in this pack were selected by the examiner to answer the open questions from day 13. Your call sheet works like every comparison so far: describe the field first (what you SEE), then name the pattern (what it MATCHES), then connect it to the finding it explains (what it MEANS for the cause tree). Name first and you start seeing what the name predicts. Three columns, same discipline as day one.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D14-A1

Name the four tissue families and one job each, from the reading. Copy the first three words of the sentence you used.

PBS-U1-
D14-A2

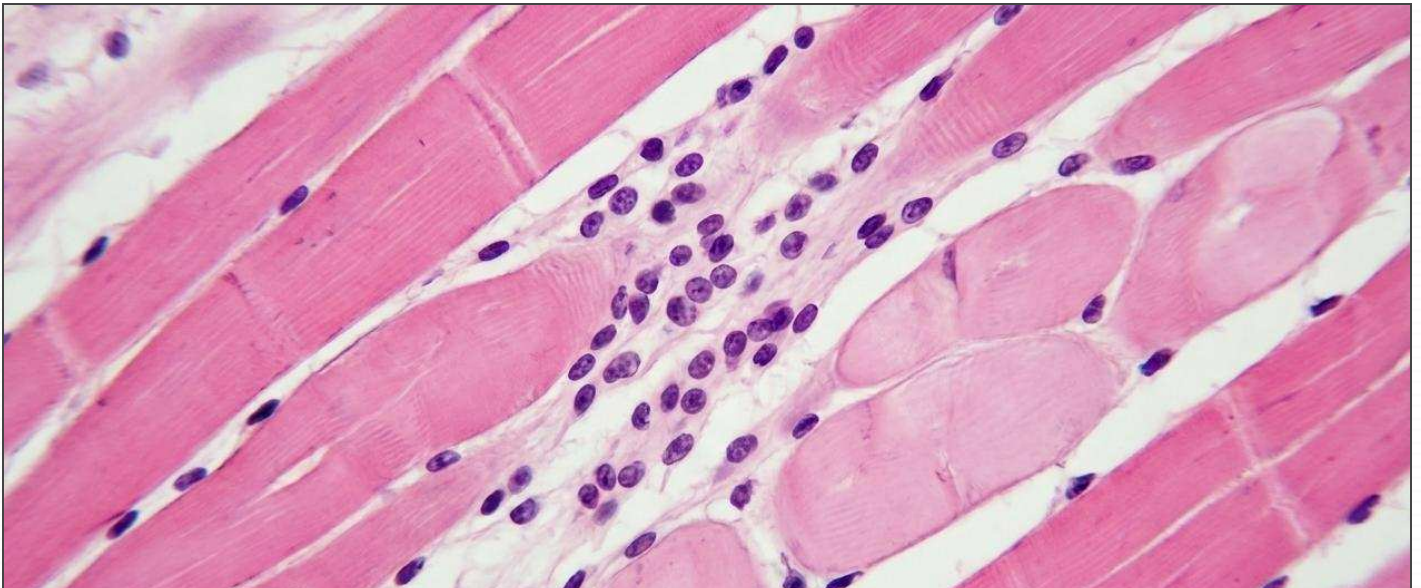
The reading gives an order for reading a slide: describe, name, connect. Why that order and not the reverse?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

A histology call on a practice slide (training case, not ours)

A training slide, card T-4, is labeled 'skeletal muscle, thigh, from a crush injury case' at 200x, and you must fill one call-sheet row for it.



What to notice: Notice the pale gaps between fibers (edema) and the crowd of small dark nuclei in those gaps (inflammatory cells), and compare both against the tight, evenly packed fibers a healthy reference would show.

1. Put the healthy reference for the same tissue family on the table first. Healthy skeletal muscle: long parallel fibers, fine repeating bands across them, nuclei pushed to the edges of each fiber. Result: you now know what 'normal' looks like before you look at the case card.
2. Read the magnification and turn it into a real size. At 200x the whole printed field is about 1 millimeter across in real life. Result: any feature you describe can be sized against that 1 millimeter.
3. Describe before you name. What you see: the fibers are pushed apart by wide, pale, watery spaces; many small dark nuclei crowd between the fibers; several fibers look pale and swollen. Result: three visible features written down with no pattern word yet.
4. Now name the pattern from the features. Wide pale spaces where tissue should be tight = edema (fluid where it should not be). Small dark nuclei crowding in = inflammatory cells, the body's response crew. Result: 'edema with inflammation' and each word points at a feature you already wrote.
5. Connect it to the organ finding it explains. The training case's exam sheet says 'thigh swollen and bruised.' The slide shows the process behind that: fluid and response cells in the muscle. Because a response crew only arrives in a living body, this is also a vital response: the crush happened while the person was alive. Result: the connection column names the exam finding and what the slide adds to it.
6. Estimate one size to prove the magnification step. One nucleus spans about one hundredth of the 1 millimeter field: $1 \text{ mm} \div 100 = 0.01 \text{ mm} = 10 \text{ micrometers}$ ($1 \text{ mm} = 1,000 \text{ micrometers}$), precise to about the nearest few micrometers on a printed image. Result: a number with a unit and an honest precision.
7. Write the ceiling sentence. Result: 'This slide supports a mechanism (crush injury with a living response). It cannot say what did the crushing, who was there, or the manner of death.'

Finished product: Call-sheet row: skeletal muscle (200x); healthy = tight parallel banded fibers; seen = fibers pushed apart by pale spaces, dark nuclei crowding in, swollen fibers; pattern = edema with inflammation, a vital response; connects to the exam finding 'thigh swollen and bruised'; supports a mechanism, not a manner.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The histology slide set (E12) came back: three case slides and one healthy reference card, all marked SIMULATED. Team E led the reads (describe, then name, then connect), the class wrote the mechanism chain on the board, and the logic tree was pruned but not resolved.

Slide 1: pancreas islet (E12, EXHIBIT 017; healthy reference EXHIBIT 016)	Tissue family: gland tissue, which belongs to the epithelial family (gland cells are lining cells that make and release chemicals). Healthy reference: one pale rounded island of hormone-making cells set in darker enzyme-making tissue. Field: the pale island is crowded and rimmed by many small dark immune cells; the darker tissue around it looks normal. Pattern the class called: immune cells attacking the islet, the autoimmune attack that destroys insulin-making beta cells in type 1 diabetes. The slide does not show when the diabetes began. Connects to: the Day 13 packet line 'pancreas grossly unremarkable, histology pending', the Day 10 panel (vitreous glucose 612 mg/dL, ketone 8.2 mmol/L), and E6 (an expired, sealed insulin pen). Magnification: 200x.
Slide 2: kidney (E12, EXHIBIT 018; compare with the healthy islet card for what normal tissue looks like)	Tissue family: the filtering tubes are lined by epithelial cells. Field: a round filter tuft (called a glomerulus) beside tubes whose lining cells look swollen, pale, and foamy. Pattern the class called: osmotic change (osmotic means caused by water being pulled toward fluid loaded with dissolved sugar), tubule cells stressed by very high sugar in the filtered fluid. Connects to: the Day 10 panel glucose and the Day 9 meter readings (412 mg/dL, then HI above the 600 ceiling).
Slide 3: scalp wound margin (E12, EXHIBIT 019)	Tissue family: skin, a thin lining (epithelial) layer over connective-tissue packing; the set has no healthy skin card, so the healthy connective card is the closest reference. Field: red blood cells and small dark immune cells spread out between the fibers at the torn edge. Pattern the class called: vital response, confirmed at tissue level (bleeding into tissue and the arrival of immune cells happen only while the heart is still beating). Connects to: the Day 13 external finding, a right temporal scalp laceration 3.1 cm with paint transfer from the console corner and bleeding into surrounding tissue.
Mechanism chain written on the board (Day 14)	No insulin, so sugar is stuck outside the cells; the body burns fat instead; acid (ketones) builds up; confusion, weakness, collapse. The class named it: diabetic ketoacidosis, from a type 1 diabetes diagnosed years ago (DOC-2 background card) and recently left untreated (E6 pen unused, E5 meter, E10 panel, E12 slide 1).
Tree state after today (not resolved)	Pruned today or earlier, with reasons: poisoning or overdose (E10: every drug class negative, ethanol negative); a fatal head blow (E11: no skull fracture, no bleeding inside the skull, no defensive wounds; E3: no impact or cast-off spatter; E12 slide 3: the corner cut him while he was alive). Surviving: every branch the medical thread has not pruned; nothing resolves until the records on Day 16. Still open until the records on Day 16: the Sun 3:00 AM DOOR HELD row on DOC-6, and Okoye's whereabouts Saturday night.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

One row per case slide. Keep the healthy reference card for that tissue family on the table while you read. Describe what you SEE before you name what it MATCHES.

FIELD: the circle you see through the microscope (or the printed micrograph). Describe the whole field, not one corner.

MAGNIFICATION: how many times larger the image is than the real tissue. At 100x, a feature 1 millimeter wide on the image is 0.01 millimeter in real life.

INFLAMMATORY CELLS: the body's response crew: small cells with dark nuclei that crowd into injured or infected tissue.

SLIDE (MAGNIFICATION)	TISSUE FAMILY AND WHAT THE HEALTHY REFERENCE LOOKS LIKE	DESCRIPTION: WHAT YOU SEE (SPACES, CELLS, STRUCTURE)	PATTERN CALL AND THE FINDING FROM DAY 13 IT CONNECTS TO

PBS-U1-D14-B1

Call sheet complete: every slide described before it is named, every call citing a visible feature, every connection naming a Day 13 finding. (Scored on the table.)

PBS-U1-D14-B2

Pick the slide that differs most from its healthy reference. Write the two visible differences and the pattern name they earn.

PBS-U1-
D14-B3

Practice numbers. Through the microscope, the field you see is 2 millimeters across in real life. A cell spans one twentieth of the field. How wide is the cell in millimeters? In micrometers (1 millimeter = 1,000 micrometers)? State the precision your estimate deserves.

PART C · WRITE THE CALL

SEC 03

Write the histology paragraph for the case file. For two slides, the description, the pattern, and the Day 13 finding it explains; then the sentence that says what tissue findings can support (a mechanism) and what they cannot name (a manner).

Claim ceiling. Tissue findings support mechanisms; they do not name manners. The tree prunes further today, but it does not resolve.

PBS-U1-
D14-C1

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D14-D1

Use **histology** and **edema** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D14-E1

☐

Widened, pale spaces in tissue that should be tight. Pattern?

PBS-U1-
D14-E2

☐

Why describe before naming?

PBS-U1-
D14-E3

☐

What are the four tissue families?

TURN IN

SLIP

Histology call sheet: Per-slide: description, pattern, connection; Logic tree pruning noted; One remaining open question.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook. Pre-lab gate: Histology: Four Tissue Types simulation at mendozabiomed.org/learn/lab-sim/pbs-histology-four-tissue.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Handling, Preparation, Storage and Disposal (53.93 percent of the test), Ohio outcome 5.5 Laboratory Standard Operational Procedures.

Ohio Health Science	5.5.5	Explain the principles of microscopy and process a specimen for light microscopy.
Ohio Health Science	2.1.14	Describe the difference between pathology and physiology and the conditions typically observed during a disease state.
Ohio Health Science	2.1.15	Explain the pathophysiology changes associated with or resulting from disease or injury for each body system.
PLTW PBS framework	ANP-A.4	Demonstrate how a change in structure in the body impacts function.
PLTW PBS framework	GLP-B.5	Demonstrate proper use of a microscope to view biological samples.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
Common Core	RST.9-10.4	Determine the meaning of symbols, key terms, and domain-specific words as used in a scientific or technical context.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	WHST.9-10.2	Write informative or explanatory texts, including scientific procedures and technical processes, with precise language and domain-specific vocabulary.
Common Core	HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
NGSS	SEP-6	Constructing explanations: construct an explanation based on valid and reliable evidence.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D14-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.14a	Name the four tissue families and what each does	items A1, E3
PBS.S.14b	Describe a field before naming a pattern, and cite the visible feature	items B1, E2, C1
PBS.S.14c	Recognize edema and inflammation on a slide against a healthy reference	items B2, E1, D1
PBS.S.14d	Use magnification to estimate real size	items B3

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 25 OF 28 Wed, Sep 30 about 80 minutes**Investigation Day 15: Where Claims Must Stop**

Today we need to accomplish study how a real-style wrongful conviction happens, name the reasoning failures that build one, and set the claim ceiling for your own case report.

Our goal is debate how much evidence is enough to name a cause of death, and defend your threshold.

You have to turn in Written CER (3-5 sentences) arguing what evidence threshold justifies a cause-of-death conclusion, referencing convergent evidence and at least one risk on either side. Post your CER to the discussion board or hand in the written copy before leaving.

Schoology assignment: Wk6 D15 · Where Claims Must Stop

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D15 Case A briefing pack (read this)** (3 pages); then **D15 Case A Daily Evidence Sheet (write on this)** (8 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

READ

Read the prompt: When is the evidence strong enough to conclude?

3

WRITE

List one risk of concluding too early and one of never concluding.

HINT The most dangerous evidence is the kind that makes you stop looking. Tunnel vision is a process failure, and process failures have process fixes.

4

DO

Choose a side: high certainty required vs. reasonable certainty suffices.

5

WRITE

Argue your claim in your group, referencing convergent evidence.

6

TURN IN

Post a written CER stating your evidence threshold and reasoning.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk6 D15 · Where Claims Must Stop**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D15
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

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OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Oct 2 · Investigation Day 15 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that organs are built from four tissue families. Disease and injury change the weave, and the microscope reads the weave.

Real investigators study wrongful convictions on purpose, to learn how careful, well-meaning people still reach wrong conclusions, and then they build rules to stop it happening again. Today you do the same, and you write your own claim ceiling before you know your answer, so the ceiling cannot bend to fit the verdict.

OBJECTIVE

Today you will study how a real-style wrongful conviction happens, name the reasoning failures that build one, and set the claim ceiling for your own case report.

Take-home (the ten-year idea): The most dangerous evidence is the kind that makes you stop looking. Tunnel vision is a process failure, and process failures have process fixes.

CASE FILE UPDATE

SEC 01

Before you conclude anything, study how conclusions go wrong. The review-unit packet, then your own claim ceiling, written in advance.

Today's packet is a compact fictional composite of how wrongful convictions actually happen, built from the standard documented failure patterns: an eyewitness certain and wrong (certainty and accuracy are different dials, and accuracy is the one that counts), class evidence oversold as individual ('consistent with' heard as 'matched'), tunnel vision (early suspect, evidence read to fit), and incentives to close. No real names; the PATTERNS are the lesson.

The fixes are process, not virtue: blind comparisons (features before names, as you practiced day 7), corroboration requirements (no conclusion on one line of evidence, day 12's lesson), stated limits on every result (every ceiling you have written), and a standing question: what SHOULD I be seeing if my theory is wrong, and did anyone look?

Then the mirror turns: tomorrow you synthesize. Today you write the claim ceiling for your own report BEFORE you know your conclusion, so the ceiling cannot bend to fit the verdict. That order matters: limits set after a conclusion protect the conclusion; limits set before protect the truth.

THE DECISION OF THE DAY

SEC 03

YOUR ROLE

You are the case-review unit auditing a closed case.

THE SITUATION

The wrongful-conviction packet: a short case file where the conviction later failed, with the original investigators' notes.

THE RULE YOU APPLY

Find the exact sentences where reasoning failed; classify each failure (certainty-for-accuracy, class-as-individual, tunnel vision, ignored negative evidence); write the process rule that would have caught it.

WHAT YOU PRODUCE

Claim-ceiling exit slip: the packet's failures named with quotes, plus your own report's claim ceiling written in advance.

Claim ceiling. The packet is a teaching composite. Real exonerations involve real people; our audit trains the pattern-spotting, it does not adjudicate anyone.

WHAT THIS UNLOCKS

Tomorrow: synthesis. Every thread, one table, the tree resolves.

PLTW ANCHOR AND INTERACTIVE LAYER

REF

Project 1.2.6 Case Closed (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Brief one failure pattern at conference with the packet's example.

B Trace

Brief one failure pattern at conference.

C Serology and DNA

Brief one failure pattern at conference.

D Toxicology and Chemistry

Brief one failure pattern at conference.

E Medical Examiner

Preview tomorrow's synthesis table structure for the class.

F Records and Timeline

Run the tunnel-vision self-audit on OUR matrix: whose against-column did the room resist filling? (Honest expected answer: Cole, the finder, kept drawing suspicion his evidence never earned.)

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Day 15 Cornell page
- Claim-ceiling card (inside back cover): personalize it today

DAILY SUBMISSION FORM: CLAIM-CEILING EXIT SLIP

JH-26-0831-A / D15

- ☐ Failures named with quoted sentences
- ☐ Process fix per failure
- ☐ Your report's claim ceiling, written in advance

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D15-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Oct 2 · Investigation Day 15 of 18 · Where Claims Must Stop

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOMES 5.8 AND 1.3

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Oct 2, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real investigators study wrongful convictions on purpose, to learn how careful, well-meaning people still reach wrong conclusions, and then they build rules to stop it happening again. Today you do the same, and you write your own **claim ceiling** before you know your answer, so the ceiling cannot bend to fit the verdict.

Today you will: study how a real-style wrongful conviction happens, name the reasoning failures that build one, and set the **claim ceiling** for your own case report.

The ten-year idea: The most dangerous evidence is the kind that makes you stop looking. Tunnel vision is a process failure, and process failures have process fixes.

TUNNEL VISION: locking onto one suspect or one story so early that evidence against it stops getting looked at. Analogy to hold onto: driving with the mirrors folded in.

CLAIM CEILING: the strongest sentence the evidence can carry. Say that sentence and no stronger. Analogy to hold onto: a load limit sign on a bridge.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Today's packet is a compact fictional composite of how wrongful convictions actually happen, built from the standard documented failure patterns: an eyewitness certain and wrong (certainty and accuracy are different dials, and accuracy is the one that counts), class evidence oversold as individual ('consistent with' heard as 'matched'), **tunnel vision** (early suspect, evidence read to fit), and incentives to close. No real names; the PATTERNS are the lesson.

The fixes are process, not virtue: blind comparisons (features before names, as you practiced day 7), corroboration requirements (no conclusion on one line of evidence, day 12's lesson), stated limits on every result (every ceiling you have written), and a standing question: what SHOULD I be seeing if my theory is wrong, and did anyone look?

Then the mirror turns: tomorrow you synthesize. Today you write the **claim ceiling** for your own report BEFORE you know your conclusion, so the ceiling cannot bend to fit the verdict. That order matters: limits set after a conclusion protect the conclusion; limits set before protect the truth.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D15-A1

The reading says certainty and accuracy are different dials. Which one counts, and why? Copy the first three words of the sentence you used.

PBS-U1-
D15-A2

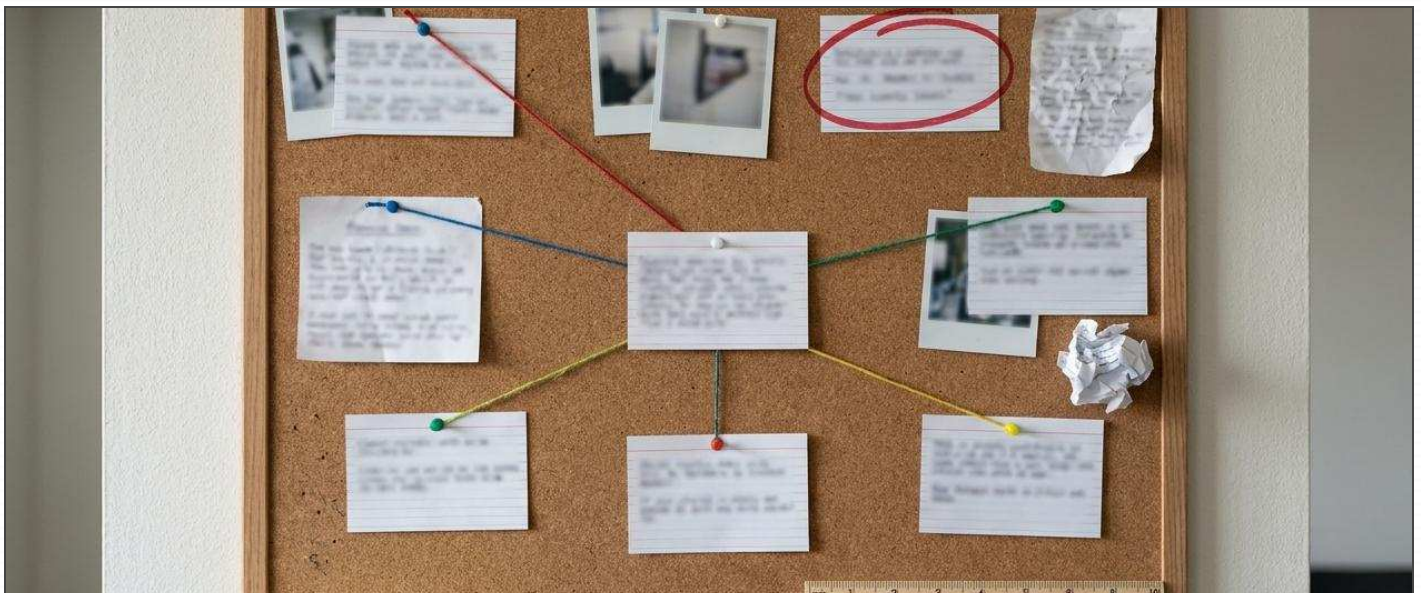
Why does the reading tell you to write your claim ceiling before you know your conclusion?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Audit a practice file: the bike-shop burglary (made up)

A closed training file: a bike shop was broken into at night, a crowbar was left behind, one suspect was charged, and you must audit four sentences from the original notes.



What to notice: Notice that every string runs to one center card and nothing on the board points anywhere else, which is what a file looks like once the investigators have stopped asking what they should see if they are wrong.

1. Read the whole file once with a highlighter and mark every sentence where a claim goes further than its evidence. Result: four sentences marked: (1) 'Owner recognized the voice on the alarm-company recording without hesitation; identification considered solid.' (2) 'Blue paint flakes on the crowbar are the same color as the suspect's truck; paint matched.' (3) 'Neighbor states the suspect's truck never left the driveway; neighbor is elderly, statement discounted.' (4) 'Investigation narrowed to the suspect after the paint result; the two pawn-shop leads were dropped.'
2. Classify sentence 1 against the four patterns. 'Without hesitation' describes confidence, not correctness, and the file treats confidence as proof. Result: certainty for accuracy. Process rule: treat an identification as a lead to test, not a finding; record what the witness could actually hear and for how long. Taught: today's reading.
3. Classify sentence 2. Paint color is class evidence (many trucks share a factory blue), so 'matched' claims an individual source the test never established. Result: class sold as individual. Process rule: class evidence is reported as 'consistent with' plus the size of the class; the word 'matched' is reserved for individual evidence. Taught: Day 7.
4. Classify sentence 3. An alibi that cuts against the theory was dismissed because of who carried it, not tested. Result: ignored negative evidence. Process rule: test the alibi with something independent (a traffic camera, the truck's mileage, a phone location), then weigh it. Taught: today's reading.
5. Classify sentence 4. After one result, other leads were dropped and no one asked what they should be seeing if the theory were wrong. Result: tunnel vision. Process rule: no narrowing to one suspect until two independent threads support it; keep a standing question, 'what should I see if I am wrong, and did anyone look?' Taught: Day 12 (corroboration).
6. Pick the failure that did the most damage and the one sentence that should have stopped the case. Result: sentence 2, because 'paint matched' is what triggered the narrowing in sentence 4; the stopping sentence is the neighbor's statement, which, if tested and true, removes the suspect's truck from the scene.

Finished product: Audit table: row 1 certainty for accuracy (test identifications; today's reading); row 2 class sold as individual (report 'consistent with' and the class size; Day 7); row 3 ignored negative evidence (test the alibi independently; today's reading); row 4 tunnel vision (two independent threads before narrowing; Day 12). Most damage: the paint 'match', which fed the narrowing.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

Day 15 had no new case exhibits. The class audited the review file (DOC-7, 'the corner store case', a fictional composite), classified four sentences from the original investigators' notes using the four failure patterns, and wrote an advance claim ceiling for our own report before the final records open on Day 16.

DOC-7 summary, part 1	Twenty years ago a corner-store clerk was injured in a late-night robbery. A customer who saw the robber for several seconds through door glass picked suspect R. from a photo array (a set of photos shown to a witness) two days later and testified, 'I will never forget that face. One hundred percent.' R. lived four blocks away and had a shoplifting record from age sixteen.
DOC-7 summary, part 2	A hair from a knit cap dropped at the scene was examined under a microscope; the analyst testified it was 'consistent with' R.'s reference sample, and in closing the prosecutor told the jury the hair 'matched the defendant.' R.'s cousin testified R. was at a birthday party that night; the jury was told the cousin 'would say anything for family.' Investigators stopped developing other leads after the photo array; a second man seen running two streets over was never interviewed. R. was convicted.
DOC-7 summary, part 3	Nine years later, DNA from the cap's inner band excluded R. entirely and matched a man already serving time for two similar robberies, who later admitted to this one. R. was released with an apology and a settlement that could not return the nine years.
The four sentences to audit (quote them exactly)	(1) 'Witness is fully certain; identification considered established.' (2) 'Hair evidence matches suspect.' (3) 'Alibi witness is family; disregarded.' (4) 'No further suspects developed; case focus confirmed on R.'
The four failure patterns (from the one-pager)	Certainty for accuracy: a witness's confidence is a feeling about a memory, not a measurement of it. Class sold as individual: 'consistent with' means the item could share a source with millions of others; 'matched' claims something never established. Tunnel vision: once a suspect feels right, every fact gets read their way and other leads starve. Ignored negative evidence: an alibi, an exclusion, or an absence that cuts against your theory is still evidence; dismissing it because of who carries it is how the innocent stay convicted.
Where the unit taught each rule (for the last column)	Blind comparison, features before names, class versus individual: Day 7. Corroboration, no conclusion on one line of evidence: Day 12. Stated limits on every result: every day's ceiling. Negative evidence counts: today's reading.
Our matrix as of Day 14, for writing your advance ceiling (findings only)	Every stain and DNA result so far traces to the victim alone (E2, E4, E-STR). Cole: DOC-6 shows his fob OUT Fri 9:02 PM and IN Mon 7:38 AM; his one blanket hair has no root tag (E7); his fader-panel print is an aged partial (E8). Vasquez: the DMs are 11 months old (E9b); no trace at the scene (E7, E8); blood type and STR excluded (E2b, E-STR). Okoye: no trace at the scene; whereabouts Saturday night not yet on record. Tran: never claimed present; master key unused on DOC-6. Open records question: the Sun 3:00 AM DOOR HELD row.

F team's self-audit question at conference

Which person's against-column did the room resist filling, and what does that column actually hold? Answer it from the matrix rows above, not from a feeling.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Audit the wrongful-conviction packet in today's pack. For each failure you find, quote the exact sentence, classify it, and write the process rule that would have caught it.

PROCESS FAILURE: a mistake built into how the work was done, not a bad person. Process failures have process fixes: blind comparisons, corroboration rules, stated limits.

QUOTED SENTENCE FROM THE PACKET	FAILURE TYPE (CERTAINTY FOR ACCURACY, CLASS AS INDIVIDUAL, TUNNEL VISION, IGNORED NEGATIVE EVIDENCE)	THE PROCESS RULE THAT WOULD HAVE CAUGHT IT	WHERE THIS UNIT TAUGHT THAT RULE (A DAY, OR TODAY'S READING)

PBS-U1-D15-B1

☐

Audit table complete: four quoted sentences, each classified, each with a rule and the day it comes from. (Scored on the table.)

PBS-U1-D15-B2

☐

Which failure in the packet did the most damage, and what single sentence in the original notes should have stopped the case?

PBS-U1-
D15-B3

☐

Practice numbers (a made-up review, not a real statistic). A review of 200 overturned cases finds eyewitness error in 140 of them. What percent is that? Does that number tell you how often eyewitnesses are wrong in ALL cases? Explain in one sentence why not.

PART C · WRITE THE CALL

SEC 03

Write your own case report's claim ceiling now, before you know the conclusion. Cover four things: the strongest kind of sentence you will allow yourself about manner, about cause, and about each person of interest; the corroboration rule you will hold yourself to; and the limitation you already know your case will carry. Four to six sentences.

Claim ceiling. The packet is a teaching composite. Real exonerations involve real people; our audit trains the pattern-spotting, it does not adjudicate anything.

PBS-U1-
D15-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D15-D1

☐

Use **tunnel vision** and **claim ceiling** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D15-E1

☐

A witness is absolutely certain. What does certainty measure?

PBS-U1-
D15-E2

☐

'The hair was consistent with the suspect' became 'the hair matched.' Name the failure.

PBS-U1-
D15-E3

☐

Why write your claim ceiling before your conclusion?

TURN IN

SLIP

Claim-ceiling exit slip: Failures named with quoted sentences; Process fix per failure; Your report's claim ceiling, written in advance.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	1.3.3	Use ethical character traits consistent with workplace standards (e.g., honesty, personal integrity, compassion, justice).
Ohio Health Science	1.2.1	Extract relevant, valid information from materials and cite sources of information (e.g., medical reports, fitness assessment, medical test results).
Ohio Health Science	1.2.7	Use problem-solving and consensus-building techniques to draw conclusions and determine next steps.
Ohio Health Science	5.8.11	Draw conclusions and propose next steps based on observations and data analysis, recognizing that experimental results must be open to the scrutiny of others.
PLTW PBS framework	ERM-A.7	Weigh the ethical implications of biomedical science decisions.
PLTW PBS framework	ERM-A.8	Summarize and explain the larger ethical, moral, and legal issues related to scientific research, product development, and use in society (animal use/human research).
PLTW PBS framework	CCP-B.2	Conduct research using credible resources to craft explanations and draw conclusions while acknowledging the limitations, opposing views, and biases.
Common Core	RST.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or recommendation.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	WHST.9-10.9	Draw evidence from informational texts to support analysis, reflection, and research.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D15-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.15a	Tell certainty from accuracy and class from individual in a written record	items A1, E1, E2
PBS.S.15b	Classify a reasoning failure and name the process rule that would have caught it	items B1, B2
PBS.S.15c	Read a proportion and say what it does and does not show	items B3
PBS.S.15d	Write a claim ceiling before knowing the conclusion	items A2, C1, D1, E3

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 26 OF 28 Thu, Oct 1 about 80 minutes**Investigation Day 16: The Tree Resolves**

Today we need to accomplish bring every thread to one table, close the last open questions with the records exhibits you already hold, resolve the logic tree, and draft your manner-and-cause claim.

Our goal is organize scene, lab, suspect, and autopsy evidence and plan the PLTW open-investigation report.

You have to turn in Evidence planning sheet: a four-column table listing each evidence stream, the specific evidence items you have from that stream, the reliability rating, and the key limitation. Hand in your planning sheet before leaving; you will need it for the evidence-board build.

Schoology assignment: Wk6 D16 · The Tree Resolves

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D16 Case A briefing pack (read this)** (4 pages); then **D16 Case A Daily Evidence Sheet (write on this)** (10 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

Take notes on how to weight different evidence types by reliability.

3

WRITE

List the four evidence streams you must integrate in this case.

HINT Corroboration closes cases: independent evidence lines agreeing. One line persuades; three lines conclude.

4

CHECK

Review what a strong investigative report includes and omits.

5

WRITE

Complete the evidence planning sheet, the John Hay version of the PLTW open-investigation planning task; it counts the same.

6

DO

Identify which variables and limitations weaken each evidence stream.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk6 D16 · The Tree Resolves**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D16
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Oct 5 · Investigation Day 16 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that the most dangerous evidence is the kind that makes you stop looking. Tunnel vision is a process failure, and process failures have process fixes.

Bring the evidence categories to one table. Compare what each record supports, where records depend on the same sample or assumption, and what remains uncertain. No fixed count proves a conclusion.

OBJECTIVE

Today you will bring every thread to one table, close the last open questions with the records exhibits you already hold, resolve the logic tree, and draft your manner-and-cause claim.

Take-home (the ten-year idea): Corroboration means evidence supports the same explanation. Check quality, dependencies and limits; no fixed number of lines makes a conclusion certain.

CASE FILE UPDATE

SEC 01

The last records add a venue post placing Okoye on stage at one recorded moment and a maintenance ticket offering an alternative explanation for the 3:00 AM alarm. Compare the remaining hypotheses and state the limits.

Synthesis has a method, and it is the day-12 method scaled up: lay every evidence line side by side, ask what each supports INDEPENDENTLY, and watch where independent lines converge. Scene, trace, serology and DNA, chemistry, medical findings, records: six threads. Assess each record for quality, relevance and dependence on other records. Agreement can strengthen a hypothesis, but counting categories does not establish independence or certify a finding.

Today the final records exhibits release and close the open threads. Records are evidence with a special power: they are time-stamped by machines and third parties, which makes them the skeleton the soft estimates hang on. A door log records detected events. Its clock, coverage, access routes and possible missing events must be checked before drawing an occupancy conclusion.

Exoneration discipline, one last time: every suspect leaves this case in one of three states: cleared by evidence, implicated by evidence, or not established by evidence. 'We could not prove it was them' and 'the evidence shows it was not them' are different sentences, and your matrix must say which one you mean, suspect by suspect.

Then the tree: walk each manner branch and ask what the assembled evidence does to it. Prune with reasons, out loud, in writing. Compare the hypotheses and state the best-supported draft with its limitations. Cite four exhibits across three categories to organize the assignment; that citation requirement does not prove a hypothesis or eliminate alternatives.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK)

SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
corroborate	when independent evidence lines agree	two witnesses who never met telling the same story
exonerate	to clear a suspect with evidence	the alibi that checks out

YOUR ROLE

Full unit at one table; F team chairs.

THE SITUATION

Everything; the matrix, the timeline, all worksheets, and the final records exhibits released today.

THE RULE YOU APPLY

Assess each branch using relevant records and their limitations. Do not eliminate a branch solely because it has fewer than two categories of evidence. Cite E-numbers for every judgment and distinguish lack of support from exclusion.

WHAT YOU PRODUCE

Draft manner-and-cause claim: one paragraph, at least four exhibits cited across at least three threads, plus the resolved suspect matrix.

Claim ceiling. Your claim names manner and cause AS THE EVIDENCE SUPPORTS THEM, states its strongest limitation, and stops there. Tomorrow's board and Thursday's report refine it; nothing is final tonight.

WHAT THIS UNLOCKS

The board build: your reasoning goes physical for cross-examination.

Project 1.2.6 Case Closed (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

INVESTIGATION TEAM ASSIGNMENTS

SEC 05

A Scene and Documentation

Brief the scene thread's independent support in two minutes.

B Trace

Brief the trace thread.

C Serology and DNA

Brief the serology and DNA thread.

D Toxicology and Chemistry

Brief the chemistry thread.

E Medical Examiner

Brief the medical thread.

F Records and Timeline

Close the threads: E14 to Okoye's row, E15 to the 3:00 AM row. Then chair the tree session. Every suspect closes with the exact sentence type the evidence earned.

NOTEBOOK PAGES IN USE TODAY

SEC 06

- Logic tree: final pruning inked
- Suspect matrix: resolution row
- Day 16 Cornell page

DAILY SUBMISSION FORM: DRAFT MANNER-AND-CAUSE CLAIM

JH-26-0831-A / D16

- ☐ One-paragraph claim
- ☐ Four exhibits cited across three threads
- ☐ Strongest limitation stated
- ☐ Matrix resolution sentences per suspect

INVESTIGATOR (PERIOD + CODE, NO
NAMES)

TEAM

TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D16-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Oct 5 · Investigation Day 16 of 18 · The Tree Resolves

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOME 5.8

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Oct 5, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Bring the evidence categories to one table. Compare what each record supports, where records depend on the same sample or assumption, and what remains uncertain. No fixed count proves a conclusion.

Today you will: bring every thread to one table, close the last open questions with the records exhibits you already hold, resolve the logic tree, and draft your manner-and-cause claim.

The ten-year idea: Corroboration means evidence supports the same explanation. Check quality, dependencies and limits; no fixed number of lines makes a conclusion certain.

CORROBORATE: when independent evidence lines agree. Analogy to hold onto: two witnesses who never met telling the same story.

EXONERATE: to clear a suspect with evidence. Analogy to hold onto: the alibi that checks out.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

Synthesis has a method, and it is the day-12 method scaled up: lay every evidence line side by side, ask what each supports INDEPENDENTLY, and watch where independent lines converge. Scene, trace, serology and DNA, chemistry, medical findings, records: six threads. Assess each record for quality, relevance and dependence on other records. Agreement can strengthen a hypothesis, but counting categories does not establish independence or certify a finding.

Today the final records exhibits release and close the open threads. Records are evidence with a special power: they are time-stamped by machines and third parties, which makes them the skeleton the soft estimates hang on.

A door log records detected events. Its clock, coverage, access routes and possible missing events must be checked before drawing an occupancy conclusion.

Exoneration discipline, one last time: every suspect leaves this case in one of three states: cleared by evidence, implicated by evidence, or not established by evidence. 'We could not prove it was them' and 'the evidence shows it was not them' are different sentences, and your matrix must say which one you mean, suspect by suspect.

Then the tree: walk each manner branch and ask what the assembled evidence does to it. Prune with reasons, out loud, in writing. Compare the hypotheses and state the best-supported draft with its limitations. Cite four exhibits across three categories to organize the assignment; that citation requirement does not prove a hypothesis or eliminate alternatives.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D16-A1

The reading says records are the skeleton the soft estimates hang on. What gives records that power? Copy the first three words of the sentence you used.

PBS-U1-
D16-A2

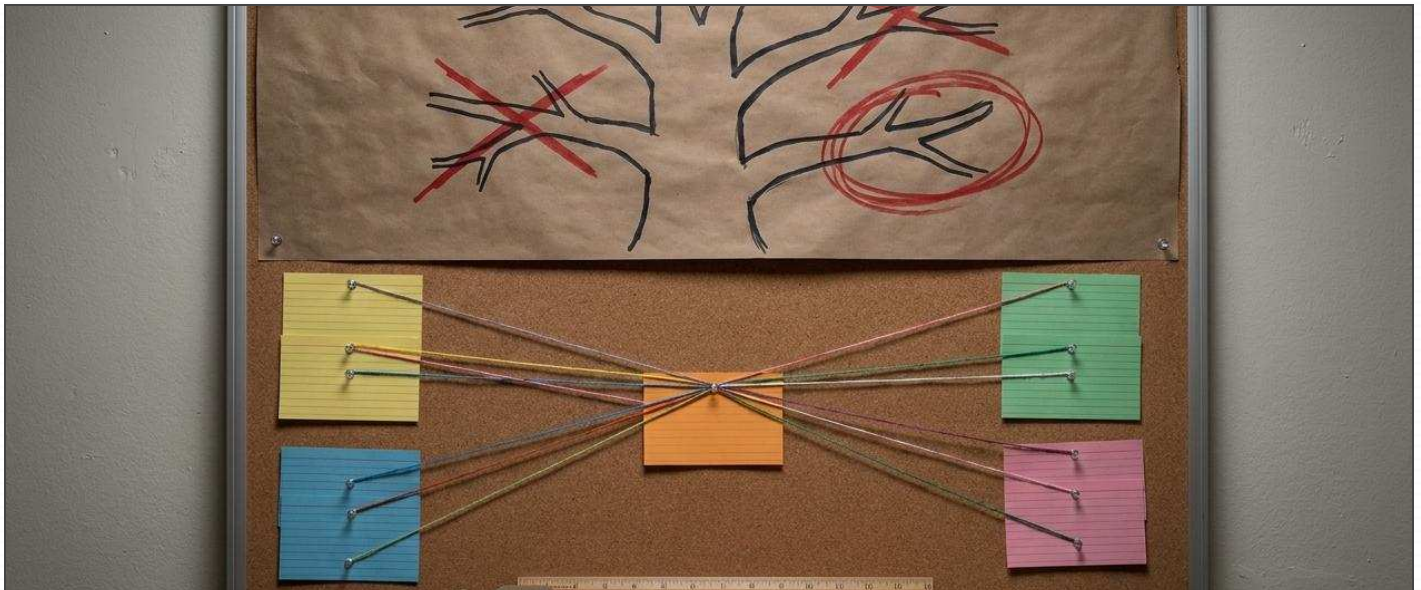
What are the three states a person of interest can leave this case in, according to the reading, and why are cleared and not established not the same sentence?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Closing a logic tree on a practice case: the Larkspur greenhouse (made up)

A groundskeeper, 58, was found dead at 6:00 PM on the floor of a closed glass greenhouse on a 34 C July afternoon, and seven practice exhibits (P1 to P7) are used to assess the tree: natural, accident, self-harm, homicide, undetermined.



What to notice: Use the pictured board as an example layout. A crossed-out branch is not evidence: explain what each record supports and keep unsupported exclusions open.

1. Lay the threads side by side with their exhibits. Scene: P1 (door latched from the inside, no forced entry, no signs of struggle, body face down between the benches) and P6 (the vent fan motor burned out, the vent shutters jammed shut). Chemistry: P2 (drug and poison screens negative; blood sodium very high and blood concentrated, the pattern of severe dehydration). Medical: P3 (no injuries; old scar tissue in the heart muscle from a heart attack years earlier; no fresh heart damage). Records: P4 (thermostat log: 46 C inside from 1:00 PM to 4:30 PM), P5 (last text at 12:50 PM to a coworker: 'fixing the vent fan, out by 3'), P7 (site badge log: the coworker who argued with him that morning badged out at 11:30 AM and never returned). Result: four threads present; no trace or serology thread in this case.
2. Assess homicide. P1 records a latched door, no forced entry and no signs of struggle; P3 records no injuries; P7 records the coworker leaving at 11:30 AM. These observations weaken some violent scenarios but do not exclude every homicide mechanism or every possible earlier action. State the limits instead of pruning by a thread count.
3. Assess self-harm. No supplied exhibit establishes intent, and P5 records a plan to leave by 3. That plan supplies context, not proof that self-harm is impossible. Record that this hypothesis is not established by the supplied evidence.
4. Assess poisoning under both accident and homicide. P2 reports negative screens. These findings concern substances detectable by those tests under their conditions; they do not exclude every poison. The tested substances and detection limits would be needed for a stronger conclusion.
5. Assess natural disease. P3 documents old heart scarring and no fresh damage. Old disease is a possible contributor, not an established cause. Absence of fresh damage does not exclude a fatal cardiac event. Do not reject a hypothesis because only one evidence category addresses it.
6. Assess heat exposure. P4 records 46 C from 1:00 PM to 4:30 PM; P2 reports findings compatible with severe dehydration; P6 records ventilation failure. P5 records the 12:50 PM plan to repair the fan, before the logged hot interval; continuous occupancy during that interval is unverified. Four exhibits across three categories meet the citation exercise, but do not certify accidental manner.

7. Assess the coworker. P7 records departure at 11:30 AM with no recorded return, and P1 records the door state at discovery. These findings do not establish involvement, but they do not exclude every earlier action or unrecorded access. State the supported proposition and its limits before drafting the claim.

Finished product: Draft claim: heat exposure is a leading hypothesis, supported by P4 (temperature log), P6 (ventilation failure), and P2 (findings compatible with dehydration). P5 records a 12:50 PM intention to repair the fan, not continuous occupancy during 1:00 PM to 4:30 PM. P3 documents old cardiac scarring whose contribution remains uncertain. Accident is a working manner hypothesis. P7 and P1 do not establish coworker involvement, but do not exclude every possible involvement. Limits include the single temperature log, unverified exposure duration, and no witnessed collapse.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The last two records exhibits released (E14, E15), Team F logged them, each team gave a two-minute summary of what its thread supports on its own, and the class pruned the logic tree branch by branch with cited reasons. Below is the evidence log as it read at the end of the period. The draft claim itself is your Part C to write.

E1 (Scene)	Body prone (face down) behind the console; speaker cabinet across the legs; acoustic blanket half-covering the lower body; no drag marks.
E3 (Scene)	Spatter card: passive drops (blood that fell straight down) and one contact smear at the console corner; no cast-off pattern and no impact spatter (patterns that can occur in some forceful bloodshed events; their absence does not exclude every blow or struggle).
E7 (Trace)	Three blanket hairs: H1 and H2 consistent with the victim; H3 consistent with Cole with no root tag (consistent with a shed hair; absence of a root tag does not establish when or how it arrived), in a shared workspace.
E8 (Trace)	Console fader panel: victim (12-point match); one partial consistent with Cole, described by the card as aged (its deposition time is not independently established); one print matching the cleaner's elimination card. Can print: victim only.
E2 and E2b (Serology and DNA)	Console-corner and floor stains: Kastle-Meyer presumptive positive; ABO type B, the victim's record type, and all four persons of interest carry other types; STR lanes L1 and L2 match the victim's reference (L4) at every band.

E4 and E-STR (Serology and DNA)	Three energy-drink cans: prints victim only; rim DNA (lane L3) matches the victim; Cole (L5) and Vasquez (L6) excluded; Okoye and Tran reference cards available on request; no other profile appears in any lane.
E5 (Chemistry)	Glucose meter memory: Sat 11:02 AM 412 mg/dL; Sat 9:47 PM HI (above the meter's 600 mg/dL ceiling); fasting range about 70 to 100.
E10 (Chemistry)	Simulated panel: drug screen negative in every class; ethanol negative; vitreous (eye-fluid) glucose 612 mg/dL (ref 70 to 100); beta-hydroxybutyrate, a ketone, an acid the body makes when it burns fat for fuel, 8.2 mmol/L (ref below 0.6); potassium 6.4 mmol/L (ref 3.5 to 5.0); bicarbonate, the blood's acid buffer, 9 mmol/L (ref 22 to 28). These are the card's supplied values and reference ranges. Postmortem results require specimen-specific interpretation; vitreous glucose is not a fasting blood measurement, and the unspecified potassium and bicarbonate samples do not independently establish the living blood levels or a fatal mechanism.
E6 (Chemistry)	Insulin pen from the desk drawer: seal intact, never used, expired five months before the weekend; matches the lapsed prescription on the Day 4 background card. This pen does not establish all insulin access or use during the weekend.
E11 (Medical)	Autopsy: right temporal scalp laceration 3.1 cm with console-corner paint transfer and bleeding into the tissue (vital response); no skull fracture; no bleeding inside the skull; no defensive wounds; mild brain swelling and lung congestion, both logged as nonspecific (seen in many kinds of death).
E12 (Medical)	Histology: pancreatic islet crowded by immune cells (the autoimmune attack of type 1 diabetes; the diagnosis date is on DOC-2); kidney tubule cells swollen from osmotic stress; scalp wound margin shows vital response.
E13 (Medical)	Time of death: body at room temperature (21.8 C in a 21 C room), rigor fully passed, livor fixed on the front surfaces matching the prone position (consistent with the found position, but movement is not excluded); the classroom interpretation places death well over a day before Monday discovery, broadly consistent with late Saturday into early Sunday; these findings do not independently fix that narrow window.
DOC-6 (Records)	Door log: Fri 9:02 PM Cole OUT; Sat 2:15 PM Bell IN; Sun 3:00 AM DOOR HELD alarm with no fob; Mon 7:38 AM Cole IN; no other entries all weekend.
E9 and E9b (Records)	Threatening DMs from the Vasquez account: platform metadata dates every message 11 months ago, during a lease dispute that ended when she leased elsewhere; nothing from that account in the last 10 months.

E14 (Records, released today)	Venue post, geotagged and time-stamped Sat 10:14 PM: Okoye on stage across town, mid-set; set list and payment record attached. It covers one moment, not the whole night.
E15 (Records, released today)	Maintenance ticket: an HVAC pressure fault has caused intermittent DOOR HELD alarms on the studio door since July, including overnight instances with no entry; work order still open. This supplies a documented alternative explanation for the Sun 3:00 AM row; it does not independently prove the cause of that particular alarm.
Mechanism chain (from Day 14)	Insufficient insulin can increase blood glucose and fat breakdown; ketone accumulation can produce acidosis, dehydration, confusion and collapse. The combined findings support diabetic ketoacidosis in a person with long-diagnosed type 1 diabetes. The precise treatment history, including whether no insulin was taken, remains an inference.
Branches pruned at today's tree session, with the exhibits that pruned them	Poisoning or overdose: E10 reports negative results for the tested classes and ethanol; untested substances and test limitations remain. Fatal head injury: E11 reports no fracture, no bleeding inside the skull and no defensive wounds; E3 reports no impact or cast-off spatter. These findings weaken a fatal traumatic explanation without excluding every assault. E12 supports injury while alive, not who caused it. Movement or staging: E13 livor and E1 scene findings are consistent with the found position but do not rule out all movement. Another person present after Sat 2:15 PM: DOC-6 records no additional entry, and E15 supplies an alternative explanation for the 3:00 AM alarm; conclusions depend on log coverage and reliability. E7, E8 and E-STR do not establish a newly deposited trace from another person. Self-harm: no provided exhibit establishes intent. Compare these limits with the positive support for DKA; no fixed thread count proves or eliminates a manner.
Per person of interest, what sits in the columns (for item B2)	Cole: DOC-6 records OUT Fri 9:02 PM and IN Mon 7:38 AM. E7 (no root tag, shared space) and E8 (partial described as aged, normal use) are compatible with prior contact but do not date it. E2 and E-STR identify the sampled stains as the victim's; that does not prove no transfer to Cole. Vasquez: E9b dates the messages to 11 months ago, with none in the last 10 months, weakening a current-threat inference from these messages. E7 and E8 report no attributed trace; E2b excludes her type for the tested stain and E-STR excludes L6 for the compared sample. Okoye: DOC-6 reports no recorded entry after Sat 2:15 PM; this concerns logged door events, not every possible occupancy. E14 places him on stage at 10:14 PM, one moment; E7 and E8 report no attributed trace. Tran: DOC-6 reports the master key unused; he never claimed presence, and no attributed trace is reported. The supplied evidence does not establish that any of these people caused the death; sample exclusions and recorded movements do not exclude every possible involvement.

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Lay the six threads side by side. For each, write what it supports on its own. Then count the evidence categories represented and describe dependencies that limit the support for your leading hypothesis.

THREAD: one team's lane of evidence: scene, trace, serology and DNA, chemistry, medical findings, records.

INDEPENDENT: evidence lines are independent only to the extent that they do not share relevant samples, sources, methods, events or assumptions. A shared category or different color does not determine independence.

THREAD	EXHIBITS FROM IT THAT MATTER FOR THE SURVIVING BRANCH (E-NUMBERS)	WHAT THIS THREAD SUPPORTS ON ITS OWN, IN ONE SENTENCE	DOES IT ALSO WEAKEN ANY OTHER BRANCH? WHICH?
Scene			
Trace			
Serology and DNA			
Chemistry			
Medical findings			
Records			

PBS-U1-D16-B1

Convergence table complete: six threads, E-numbers, a one-sentence contribution and dependency limit for each. (Scored on the table.)

PBS-U1-D16-B2

For each person of interest, write which closing sentence applies (the evidence shows it was not them; the evidence does not establish it was them; or the evidence implicates them) and the E-number that decides it.

PBS-U1-
D16-B3

☐

Count the evidence categories represented by your cited records. Then identify shared samples, sources, events or assumptions that limit independence. Check the assignment requirement of at least four exhibits across at least three categories. Show the count, but do not treat it as a measure of certainty.

PART C · WRITE THE CALL

SEC 03

Draft the manner-and-cause claim as one paragraph: the claim as the evidence supports it, at least four exhibits by E-number across at least three threads, the pruning reason for the branches that fell, and the strongest limitation. Stop there. Nothing is final tonight.

Claim ceiling. Your claim names manner and cause as the evidence supports them, states its strongest limitation, and stops there. The board and the report refine it; nothing is final tonight.

PBS-U1-
D16-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D16-D1

☐

Use **corroborate** and **exonerate** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D16-E1

☐

Why do records anchor the timeline more firmly than the time-of-death window?

PBS-U1-
D16-E2

☐

Write the two different suspect-closing sentences.

PBS-U1-
D16-E3

☐

What does a claim need before you may write it?

TURN IN

SLIP

Draft manner-and-cause claim: One-paragraph claim; Four exhibits cited across three threads; Strongest limitation stated; Matrix resolution sentences per suspect.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	5.8.11	Draw conclusions and propose next steps based on observations and data analysis, recognizing that experimental results must be open to the scrutiny of others.
Ohio Health Science	5.8.9	Describe the relationships between variables using correlations and draw conclusions.
Ohio Health Science	1.2.7	Use problem-solving and consensus-building techniques to draw conclusions and determine next steps.
PLTW PBS framework	EXD-B.4	Draw logical conclusions from experimental data.
PLTW PBS framework	CCP-A.1	Synthesize information from multiple credible sources, such as literature, databases, policy documents, and diverse perspectives from multiple disciplines, to explore causes and solutions to problems.
PLTW PBS framework	CCP-B.2	Conduct research using credible resources to craft explanations and draw conclusions while acknowledging the limitations, opposing views, and biases.

Common Core	RST.9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or recommendation.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	WHST.9-10.9	Draw evidence from informational texts to support analysis, reflection, and research.
Common Core	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently, and choose and interpret the scale and the origin in graphs and data displays.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D16-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.16a	Lay evidence lines side by side and find where independent lines converge	items B1, B3, E3
PBS.S.16b	Use records as the timeline's skeleton and explain why	items A1, E1
PBS.S.16c	Close every person of interest by evidence, in the right sentence	items A2, B2, E2, D1
PBS.S.16d	Draft a claim with four exhibits across three threads and a stated limitation	items C1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.

ASSIGNMENT 27 OF 28 Thu, Oct 1 about 45 minutes**John Carroll bioethics debate 2: should we ban antibiotic use in livestock?**

Today we need to accomplish debating an assigned side on a real public health question.

Our goal is arguing from evidence and answering the strongest opposing point.

You have to turn in your five-box debate worksheet.

Schoology assignment: Wk6 CER: JCU bioethics 2, should we prohibit antibiotic use in livestock?

1

READ

First, the scenario and the first argument on each side.

Scenario. An isolated mountain valley has clear streams and no industry. A bacterial outbreak hits the local livestock, so the community treats the herds with a large course of antibiotics. Weeks later, researchers find antibiotic traces in the stream water, a shifted bacterial population, and new antibiotic resistance genes.

The case for a ban: Even low concentrations of antibiotics favor resistant strains and spread resistance genes through the environment and into the food chain.

The case against: Antibiotics do break down in the environment through biodegradation, hydrolysis and sunlight, at rates that depend on pH, temperature and light.

2

WRITE

Box 1: your side. Box 2: your three strongest arguments, each with a reason someone could check.

Scenario. An isolated mountain valley has clear streams and no industry. A bacterial outbreak hits the local livestock, so the community treats the herds with a large course of antibiotics. Weeks later, researchers find antibiotic traces in the stream water, a shifted bacterial population, and new antibiotic resistance genes.

The case for a ban: Even low concentrations of antibiotics favor resistant strains and spread resistance genes through the environment and into the food chain.

The case against: Antibiotics do break down in the environment through biodegradation, hydrolysis and sunlight, at rates that depend on pH, temperature and light.

HINT Selective pressure: an antibiotic kills the bacteria it can, so the resistant ones survive and multiply.

3

WRITE

Box 3: the opposing point. Box 4: your direct answer to it. Box 5: where you stand now and what moved you.

4

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk6 CER: JCU bioethics 2, should we prohibit antibiotic use in livestock?**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.

ASSIGNMENT 28 OF 28 Fri, Oct 2 about 80 minutes**Investigation Day 17: Build the Board**

Today we need to accomplish build the evidence board from the card kit: your case's reasoning made physical, then defended under peer cross-examination.

Our goal is construct a team evidence board linking all evidence streams to a tentative conclusion.

You have to turn in Individual notebook entry: sketch or description of your team's evidence board, the tentative cause-of-death claim, one corroborating link you found most convincing, and one gap your team could not fill. Upload the evidence board photo and your notebook entry to the tracker before leaving.

Schoology assignment: Wk6 D17 · Build the Board

1

READ

This is our Case A (STATIC) investigation for Period 1-2. Your materials for this assignment start on the very next page, in this order: **D17 Case A briefing pack (read this)** (3 pages); then **D17 Case A Daily Evidence Sheet (write on this)** (8 pages). Read the briefing first. Write your answers on the sheet. Everything you need for this assignment is in those pages.

2

DO

As a team, post each evidence item to the board by stream.

3

DO

Draw links showing how items corroborate or conflict.

HINT If the board cannot show it, the report cannot claim it. A conclusion you cannot diagram is a conclusion you do not understand.

4

DO

Flag gaps where evidence is missing or weak.

5

WRITE

Draft a tentative cause-of-death claim the board supports.

6

DO

Note each stream's limitations beside its evidence cluster.

7

CHECK

Before you turn it in, check your claims against these limits: A hair consistent with a person proves a hair like theirs was present, not that the person was, and never when. A fingerprint proves touch, not when or why. A pattern class narrows a crowd; only minutiae can name one finger. A presumptive test says maybe. Only a confirmatory test says blood, and only DNA says whose.

8

TURN IN

Now we turn it in. Make your work one PDF (in Google Docs: File, Download, PDF Document; on a phone, scan the pages into one PDF). Open Schoology, choose Principles of Biomedical Technology, and open the assignment named **Wk6 D17 · Build the Board**. Select Submit Assignment, attach the PDF, select Submit, and check that it says submitted.



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D17
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY INVESTIGATION PACKET

Oct 6 · Investigation Day 17 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT

SEC 00

Picking up from yesterday: you learned that corroboration means evidence supports the same explanation. Check quality, dependencies and limits; no fixed number of lines makes a conclusion certain.

Real detectives build an evidence board so that anyone can follow the reasoning and attack its weakest link, because a claim that cannot survive a hard question is not ready. Today you build your board and defend it under cross-examination.

OBJECTIVE

Today you will build the evidence board from the card kit: your case's reasoning made physical, then defended under peer cross-examination.

Take-home (the ten-year idea): If the board cannot show it, the report cannot claim it. A conclusion you cannot diagram is a conclusion you do not understand.

CASE FILE UPDATE

SEC 01

The board goes up: each connection states what its exhibit supports and where that inference stops. Keep each person-of-interest card with the evidence and its limits.

An evidence board is not decoration; it is an argument with geography. The center holds the finding. Around it: the evidence cards, each connected to what it supports, with thread-colored lines showing WHICH kind of evidence carries each link. A board where every line runs through one card is a confession of weakness; a board can show corroborating paths, but their independence must be checked against sources and methods.

Build standard: every card carries its E-number; every connection line has a one-word label (supports, excludes, times, locates); all person-of-interest cards stay ON the board with their records and limits attached, including records that count against involvement.

Then cross-examination: another team reads your board cold and attacks: which line is weakest, which card is carrying too much, what alternative explanation survives your layout. The protocol is professional: attack the reasoning, never the people; every attack cites the board itself; the defending team answers from exhibits or concedes honestly. Concessions get repaired tonight, and a repaired board is a stronger board.

THE DECISION OF THE DAY

SEC 03

YOUR ROLE

Teams build together; F team runs the layout.

THE SITUATION

The board kit (case plaque, thread labels, E-number cards, line labels), your resolved matrix and tree, one period, then cross-examination.

THE RULE YOU APPLY

Connect each claim to its cited cards and label every line. Colors identify evidence types. Check shared samples, sources, methods and assumptions before treating lines as independent.

WHAT YOU PRODUCE

The completed board, plus the board rubric self-check signed by the team.

Claim ceiling. The board shows what the evidence supports. Decoration, drama, and red string with no label add nothing; the rubric scores connections, not aesthetics.

WHAT THIS UNLOCKS

Tomorrow: the individual report. The board is the class's argument; the report is yours.

PLTW ANCHOR AND INTERACTIVE LAYER

REF

Project 1.2.6 Case Closed (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes

INVESTIGATION TEAM ASSIGNMENTS**SEC 05****A Scene and Documentation**

Scene thread cards and lines; photograph the final board.

B Trace

Trace thread cards and lines.

C Serology and DNA

Serology and DNA thread cards and lines.

D Toxicology and Chemistry

Chemistry thread cards and lines.

E Medical Examiner

Medical thread cards and lines.

F Records and Timeline

Chair layout; run cross-examination protocol; log concessions.

NOTEBOOK PAGES IN USE TODAY**SEC 06**

- Evidence board map (draw your final layout)
- Day 17 Cornell page

DAILY SUBMISSION FORM: BOARD RUBRIC SELF-CHECK

JH-26-0831-A / D17

- ☐ Rubric scored with team signatures
- ☐ Weakest-link named honestly
- ☐ Repair completed or scheduled

INVESTIGATOR (PERIOD + CODE, NO
NAMES)_____
TEAM_____
TIME SUBMITTED



OHIO CSI FORENSIC DIVISION

UNIT 1 · MEDICAL INVESTIGATION · CASE STATIC

Period 1-2 · Statik Sound, a neighborhood recording studio

FORM NO. CSI-1-D17-S
CASE NO. JH-26-0831-A
REV. 2026-27
PAGE ____ OF ____

FOR EDUCATIONAL USE

OHIO CSI FORENSIC DIVISION

DO NOT DISTRIBUTE ANSWER KEYS

DAILY EVIDENCE SHEET

Oct 6 · Investigation Day 17 of 18 · Build the Board

OFFICIAL

WEBXAM · DOMAIN 2 BIOTECHNOLOGY RESEARCH AND EXPERIMENTS · OHIO OUTCOMES 5.8 AND 1.2

VOCABULARY IN BOLD IS DEFINED WHERE IT FIRST APPEARS

INVESTIGATOR CODE (PERIOD + CODE, NOT YOUR NAME)	TEAM	DATE
		Oct 6, 2026

WHY TODAY MATTERS, IN PLAIN ENGLISH

SEC 00

Real detectives build an evidence board so that anyone can follow the reasoning and attack its weakest link, because a claim that cannot survive a hard question is not ready. Today you build your board and defend it under **cross-examination**.

Today you will: build the evidence board from the card kit: your case's reasoning made physical, then defended under peer **cross-examination**.

The ten-year idea: If the board cannot show it, the report cannot claim it. A conclusion you cannot diagram is a conclusion you do not understand.

SINGLE POINT OF FAILURE: one card that carries several links by itself, so if it falls, everything hanging on it falls too.
Analogy to hold onto: one bolt holding the whole shelf.

CROSS-EXAMINATION: another team reads your board cold and attacks the reasoning, never the people, so the weak link shows before the report is written. Analogy to hold onto: a practice scrimmage.

PART A · READ THE BRIEFING, THEN ANSWER FROM THE TEXT

SEC 01

An evidence board is not decoration; it is an argument with geography. The center holds the finding. Around it: the evidence cards, each connected to what it supports, with thread-colored lines showing WHICH kind of evidence carries each link. A board where every line runs through one card is a confession of weakness; a board can show corroborating paths, but their independence must be checked against sources and methods.

Build standard: every card carries its E-number; every connection line has a one-word label (supports, excludes, times, locates); all person-of-interest cards stay ON the board with their records and limits attached, including records that count against involvement.

Then **cross-examination**: another team reads your board cold and attacks: which line is weakest, which card is carrying too much, what alternative explanation survives your layout. The protocol is professional: attack the reasoning, never the people; every attack cites the board itself; the defending team answers from exhibits or concedes honestly. Concessions get repaired tonight, and a repaired board is a stronger board.

Answer from the reading above. Cite the sentence you used by copying its first three words in quotation marks.

PBS-U1-
D17-A1

The reading calls a board an argument with geography. What sits at the center, and what surrounds it? Copy the first three words of the sentence you used.

PBS-U1-
D17-A2

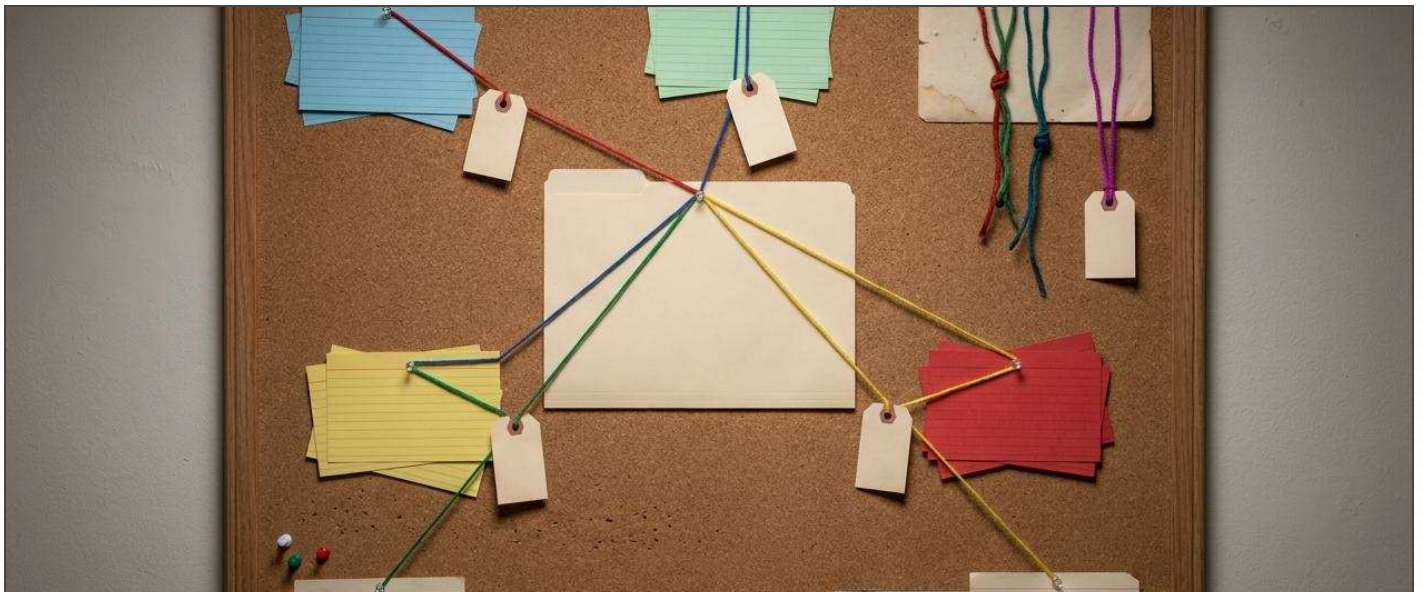
What is the protocol for cross-examination, according to the reading, and what does every attack have to name?

WORKED EXAMPLE, STEP BY STEP (A PRACTICE CASE, NOT OURS)

SEC 01A

Mapping a practice board: the Larkspur greenhouse (made up)

The greenhouse case from the Day 16 example (exhibits P1 to P7, draft claim: possible heat-related death in a greenhouse with a failed fan; old heart disease is a possible contributor, and the manner remains a hypothesis) goes onto a board, and you must map its lines, find the single point of failure, and repair it.



What to notice: Trace each path to the center and identify shared cards or assumptions. A new color or separate drawn line does not by itself add independent evidence.

1. Pin the center card (the draft claim) and one color per thread around it: scene P1 and P6, chemistry P2, medical P3, records P4, P5, P7. Pin the alternative-explanation cards (homicide, self-harm) and the coworker's card off to the side, because every person-of-interest card stays on the board with records and limits. Result: every card has an E-number-style label and a color.
2. Draw and label each line with one word. P4 to center: supports. P5 to P4: times (the 12:50 PM message precedes the logged 1:00 to 4:30 PM hot window and does not establish how long he stayed). P6 to P4: supports (the failed fan supports impaired ventilation but does not measure temperature). P2 to center: supports. P3 to center: supports (possible contributing condition; role unestablished). P1 to 'forced entry': supports the observation that no forced-entry signs were recorded. P3 to 'visible injury': supports the observation that no injuries were recorded. P7 to 'recorded badge use': times the recorded departure at 11:30 AM. These records do not exclude every homicide scenario or every way the coworker might have been involved. Result: eight labeled lines; nothing unlabeled stays up.
3. Count colors reaching the center directly. Records (P4), chemistry (P2), medical (P3) touch it; scene arrives only through P4. Result: three colors at the center.
4. Count drawn evidence paths to the center and how many pass through one card. Paths: P4; P5 via P4; P6 via P4; P2; P3 = five. Three of five run through P4: $3 \text{ divided by } 5 = 0.6 = 60 \text{ percent}$. Result: P4, the thermostat log, is the single point of failure; if the log is wrong, three of five paths fall at once.
5. Revise the diagram to show what each record supports; redrawing a path does not create independent evidence. Connect P6 directly to the center with its own 'supports' line (a burned-out fan and jammed shutters support impaired ventilation but do not measure the room temperature) and P5 directly with 'times' (the text stands on the phone record, not on the thermostat). Result: five paths, one through P4: $1 \text{ divided by } 5 = 20 \text{ percent}$, and four colors now reach the center.
6. Write the softer sentence the cross-examiner earned. Result: 'The temperature estimate rests on P4. P6 supports impaired ventilation and P2 is consistent with dehydration. These findings support a heat-exposure hypothesis but do not independently verify the logged temperature or establish the manner of death.'

Finished product: Board map: eight labeled lines, four thread colors reaching the center after repair, the share of five drawn paths through P4 changes from 60 percent to 20 percent. P4 remains the only supplied temperature measurement; the new layout alone does not establish stronger or independent scientific support.

Now do the same steps on today's real data in Part B. If you were in class, use your team's data. If you were absent or are new, use the canned data set below.

IF YOU WERE NOT IN CLASS: THE DATA YOU NEED

SEC 01B

ABSENT OR NEW TO THE CLASS? START HERE

The board kit came out (case plaque STATIC, JH-26-0831-A; six thread labels; an E-number card for every exhibit; line labels; the layout rubric). F team chaired a paper layout first, then the board went up, then

another team cross-examined it. Below is what was on the board and what each card carries, so you can map it in Part B.

Center card (the class's Day 16 draft claim)	The combined chemistry findings and diabetes history support diabetic ketoacidosis as the leading explanation for death. Scene and injury findings are consistent with collapse and contact with the console corner; they do not establish the fall sequence or whether the head injury contributed to death. Natural manner is a working interpretation, subject to the limitations of the records and investigation. The provided evidence does not establish that any person of interest caused the death; specific sample exclusions and recorded movements do not exclude every possible involvement.
Scene thread cards	E1 (body position, cabinet across the legs, no drag marks), E3 (passive drops and contact smear, no impact or cast-off).
Trace thread cards	E7 (H1, H2 victim; H3 Cole with no root tag), E8 (victim 12-point; Cole partial described as aged; deposition time not independently established; cleaner elimination; can print victim only).
Serology and DNA thread cards	E2 and E2b (presumptive positive; type B; STR L1 and L2 = victim), E4 and E-STR (can rim DNA = victim; L5 Cole and L6 Vasquez excluded).
Chemistry thread cards	E5 (meter 412 then HI), E10 (screens negative; vitreous glucose 612; ketone 8.2; potassium 6.4; bicarbonate 9), E6 (expired sealed insulin pen). Preserve the supplied values; postmortem chemistry requires specimen-specific interpretation, and this pen alone does not establish all insulin use.
Medical thread cards	E11 (laceration with paint transfer and vital response; no fracture; no bleeding inside the skull; no defensive wounds), E12 (islet destruction supports underlying diabetes, not fatal DKA by itself; kidney osmotic change; wound vital response), E13 (room temperature, rigor passed, livor fixed anterior; broad classroom timing interpretation consistent with late Saturday into Sunday, not a precise interval).
Records thread cards	DOC-6 (door log: Cole OUT Fri 9:02 PM, Bell IN Sat 2:15 PM, DOOR HELD Sun 3:00 AM, Cole IN Mon 7:38 AM), E9b (DMs 11 months old), E14 (Okoye on stage Sat 10:14 PM), E15 (HVAC fault supplies an alternative explanation for DOOR HELD alarms, not proof of this alarm's cause).
Person-of-interest cards and evidence limits	Cole: DOC-6, E7, E8, E-STR. Vasquez: E9b, E2b, E-STR, E7 and E8 (no attributed trace). Okoye: DOC-6, E14 (on stage at one recorded moment), no attributed trace. Tran: DOC-6 (master key unused), never claimed present, no attributed trace. Keep every person on the board and state the specific proposition each card supports or excludes; the records do not establish involvement or justify blanket clearance.

Line labels and what each means	supports = this card is evidence FOR the finding it connects to. excludes = under stated conditions, this result rules out the specific proposition on the connected card; it does not automatically rule out a person or every alternative. times = this card constrains a time under its stated limits. locates = this card supports a specified location claim under its stated limits.
Thread colors	The kit does not fix colors; write the color your class assigned to each thread label (ask a teammate or check the board photo at the teacher station).
Independence reminder for the count	Colors identify evidence categories, not independence. E5 and E10 use different measurement sources but both support the metabolic interpretation and require reliability checks. E11 and E12 wound findings concern the same injury. Interpret DOC-6 and E15 together when assessing the alarm. Identify shared samples, events, records and assumptions before counting support.
Canned cross-examination attack (for Part C if you were absent)	"E5 records very high readings during the weekend, and E10 supports the metabolic interpretation. Which evidence supports the timing and the treatment-history inference, and what remains uncertain if the door log is incomplete?"

Use these values exactly as your team's data for Part B and Part E. Write "canned data set" at the top of Part B so Mr. Mendoza scores it as make-up work. Where the case file does not fix a number (room measurements, clock times, hair features), the value here is a classroom placeholder; your room's real numbers replace it.

PART B · WORK THE EVIDENCE

SEC 02

Map your own board. Every line gets one label word: supports, excludes, times, or locates. Then count how many thread colors reach the center.

LINE LABEL: the one word that says what a connection does: supports, excludes, times, or locates. A line with no label is decoration.

CARD (E-NUMBER)	CONNECTED TO	LINE LABEL (SUPPORTS, EXCLUDES, TIMES, LOCATES)	THREAD COLOR

PBS-U1-
D17-B1

☐

Board map complete: every listed line labeled, every card with a thread color. (Scored on the table.)

PBS-U1-
D17-B2

☐

Which card on your board carries the most links alone? What happens to the claim if that card is wrong, and what is your repair?

PBS-U1-
D17-B3

☐

Count. How many thread colors reach the center? How many drawn evidence paths reach the center in total? How many of those paths run **THROUGH** your single-point-of-failure card, and what fraction of the drawn paths is that (show the division)? This is a diagram count, not a percentage of evidential strength or certainty.

PART C · WRITE THE CALL

SEC 03

Write the cross-examination record. Include four parts: the strongest attack the other team made on your board, in their words; your answer with the E-number that holds it; the attack you could NOT fully answer; and the repair or the softer sentence you will carry into the report because of it.

Claim ceiling. The board shows what the evidence supports. Decoration, drama, and red string with no label add nothing; the rubric scores connections, not aesthetics.

PBS-U1-
D17-C1

☐

Your writing:

PART D · VOCABULARY IN USE

SEC 04

PBS-U1-
D17-D1

☐

Use **single point of failure** and **cross-examination** correctly in one or two sentences about today's work. A definition alone does not count; use the words about something real.

PART E · SELF-CHECK AND EXIT

SEC 05

One line each. These come from today's pack; answer from memory first, then check.

PBS-U1-
D17-E1

☐

Why do person-of-interest cards stay on the board with records that count against involvement?

PBS-U1-
D17-E2

☐

What makes a board's center strong?

PBS-U1-
D17-E3

☐

A cross-examiner finds a card carrying three links alone. What did they find?

TURN IN

SLIP

Board rubric self-check: Rubric scored with team signatures; Weakest-link named honestly; Repair completed or scheduled.

Hand this sheet to Mr. Mendoza before you leave. The notebook pages named on today's pack stay in your Investigative Notebook.

STANDARDS CITED ON THIS SHEET, AND HOW IT IS USED IN DATA-DRIVEN INSTRUCTION

REF

WebXam alignment. Principles and Practice of Biomedical Technology (code 072110), Biotechnology Research and Experiments (46.07 percent of the test), Ohio outcome 5.8 Biotechnology Research and Experiments.

Ohio Health Science	5.8.12	Prepare and present findings using scientific reports.
Ohio Health Science	1.2.2	Deliver formal and informal presentations.
Ohio Health Science	1.2.4	Use negotiation and conflict-resolution skills to reach solutions.
Ohio Health Science	1.2.10	Use interpersonal skills to provide group leadership, promote collaboration and work in a team.
PLTW PBS framework	COL-A.4	Employ a peer review process to give effective and constructive feedback to meet given outcomes.
PLTW PBS framework	COL-A.2	Demonstrate teamwork and describe the importance of each team member's contribution to the project.
PLTW PBS framework	EXD-A.8	Communicate experimental findings with appropriate audiences both orally and in writing.
Common Core	RST.9-10.7	Translate quantitative or technical information expressed in words into visual form (a table or chart) and translate information expressed visually or mathematically into words.
Common Core	WHST.9-10.1	Write arguments focused on discipline-specific content: precise claims, relevant evidence, and reasoning that connects them.
Common Core	MP.3	Construct viable arguments and critique the reasoning of others.
NGSS	SEP-7	Engaging in argument from evidence: evaluate the claims, evidence, and reasoning behind currently accepted explanations.

How this sheet is used in DDI. Each item carries a code (for example PBS-U1-D17-B2). Mr. Mendoza scores every item 0, 1, or 2 (2 = complete and correct, 1 = partly, 0 = missing or wrong) and records the scores by period and investigator code, never by name. The scores roll up into these skills:

PBS.S.17a	Build an argument with geography: cards, labeled lines, documented dependencies and limits	items A1, B1, E2
PBS.S.17b	Find the weakest link and the single point of failure	items B2, B3, E3, D1
PBS.S.17c	Give and take a cross-examination professionally	items A2, C1
PBS.S.17d	Keep records that count against involvement on the board and explain their limits	items E1

Mastery rule. A skill is on track when at least two of its items score 2 (or its single item scores 2). A skill below that routes you to today's pack, SEC 02 (Background and briefing), and to the matching page on the portal, and it comes back as a warm-up question next week. These scores are Mr. Mendoza's instructional record for deciding what to reteach. They are not the report-card grade, which lives in Schoology.