



JOHN HAY BIOMEDICAL · FAMILY COURSE GUIDE · 2026 TO 2027

Biomedical Innovation

(Biotechnology for Health and Disease)

Design, prototype, and solve real biomedical and public-health problems.

Spring (Semester 2) · Periods 3-4B

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mendozabiomed.org

61 class days
January 19 to May 14
One semester

*This guide holds the whole course: the real dates, how grading works, the state exam and its honest status, and every support on the class website. Read it together, then keep it where you can find it. **Go Hornets.***

Read this guide in ten minutes

Each section starts on its own page. The portal index at the back is the map you will come back to all semester.

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One line and one address per page	

61

Class days, every one dated

56

Learning centers for this course

710

Anki flashcards, free

13

Lab simulations

THE MISSION

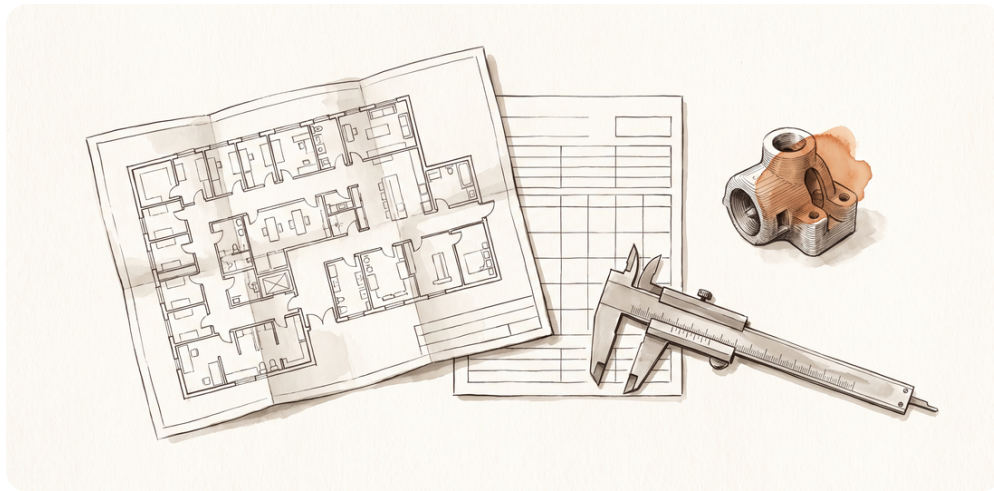
Why this course

This is the capstone: after the technique courses, your student designs. An emergency room that moves patients faster. A physiology study with statistics that hold up. An environmental health investigation. A public-health intervention for a real outbreak pattern. An innovation proposal they pitch and defend, and a forensic project to close the year.

The work runs on the engineering habits the pathway has been building: define the problem, set criteria and constraints, prototype, test against evidence, and revise. Every project lands in a portfolio your student can show to a college or an employer.

One course, two names: PLTW publishes it as Biomedical Innovation, and Ohio lists it as Biotechnology for Health and Disease. Same class, one story.

Three semesters of technique earn one semester of design.



Spring (Semester 2)

First day **Tuesday, January 19, 2027**

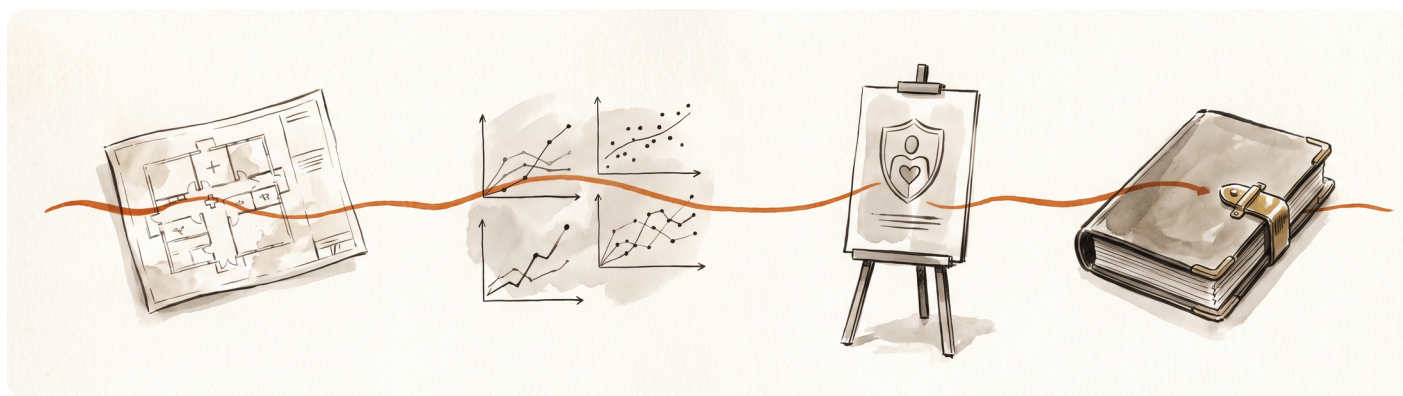
Periods 3-4B

Last curriculum day **Friday, May 14, 2027**

The course, unit by unit

These units and dates come straight from the class calendar engine, the same one that builds the website, so this table and the day pages can never disagree.

WHEN	UNIT
Jan 19 to Jan 26 · 5d	Course Orientation: how this class works, the website, Cornell notes, lab safety, and the WebXam pretest
Jan 27 to Feb 2 · 4d	Launching Biomedical Innovations: safety, your design notebook, and the SDS
Feb 3 to Feb 9 · 4d	Designing a Better ER: triage, patient flow, and stakeholder needs
Feb 10 to Feb 16 · 2d	Finding the Truth: credible sources, prior art, and needs assessment
Feb 17 to Feb 22 · 4d	Prototyping the ER: floor plans, process flow, and human factors
Feb 24 to Mar 2 · 4d	Pitch and Revise: evidence-based feedback and intro to study design
Mar 3 to Mar 8 · 4d	Reading the Body's Data: study types, sample size, and the t-test
Mar 10 to Mar 16 · 4d	Making the Call: bias, error, graph choice, and a CER conclusion
Mar 17 to Mar 19 · 3d	Pitching Innovation: problem definition, criteria, constraints, and feasibility
Mar 22 to Apr 5 · 4d	Validating Your Prototype: literature review, decision matrices, and metrics
Apr 7 to Apr 12 · 4d	Environmental Exposure: pathways, dose, and public-health risk
Apr 13 to Apr 16 · 3d	Reading the Data: graphs, trends, outliers, and correlation vs causation
Apr 19 to Apr 22 · 3d	Investigating an Outbreak: line lists, incidence, and intervention design
Apr 23 to Apr 29 · 4d	Communicating Public Health: audience, privacy, and evidence-based products
Apr 30 to May 3 · 2d	Recombinant DNA Workflow: cutting, joining, and moving genes safely
May 5 to May 10 · 4d	Transformation and Gels: selection, digests, and reading the bands
May 11 to May 14 · 3d	Forensics and Final Portfolio: chain of custody, claims, and the audit



Calendar and key dates

Month by month, then the milestone dates every family should put on the refrigerator.

January
7 CLASS DAYS
Course Orientation · Launching Biomedical Innovations

February
15 CLASS DAYS
Launching Biomedical Innovations · Designing a Better ER · Finding the Truth · Prototyping the ER · Pitch and Revise

March
15 CLASS DAYS
Pitch and Revise · Reading the Body's Data · Making the Call · Pitching Innovation · Validating Your Prototype

April
16 CLASS DAYS
Validating Your Prototype · Environmental Exposure · Reading the Data · Investigating an Outbreak · Communicating Public Health · Recombinant DNA Workflow

May
8 CLASS DAYS
Recombinant DNA Workflow · Transformation and Gels · Forensics and Final Portfolio

Date	What happens
Tue, Jan 19, 2027	Semester 2 begins. Spring courses start.
Jan 19 to 26, 2027	Spring WebXam pretest, taken in week one: the baseline before anything is taught.
Wed, Apr 14, 2027	Spring parent-teacher conferences.
Fri, May 14, 2027	Last curriculum day of Semester 2.
May 17 to 28, 2027	WebXam window for spring courses. The state window closes May 28.
Mon, May 31, 2027	Memorial Day. No school.
FOR REFERENCE: THE FALL SEMESTER	
Mon, Aug 24, 2026	First day of school. Fall courses begin.
Mon, Oct 12, 2026	Ohio's WebXam window opens. The state publishes one wide window for the whole year, October 12 to May 28, and Mr. Mendoza schedules our attempts inside it.

Days off	Why
Mon, Jan 18	Dr. Martin Luther King Jr. Day
Fri, Feb 12	No school, district calendar
Mon, Feb 15	Presidents Day
Fri, Mar 26	No school, district calendar
Mar 29 to Apr 2	Spring break
Mon, May 31	Memorial Day

The workload, in numbers. 61 class days, 15 built-in catch-up days, 13 night-before assignments, and 1 weekend assignment. Catch-up days are regular school days where the class still meets; class days count new-content days only. All of it is printed on the [submission calendar](#) and checked by the website build, so the plan you see is the plan that runs.

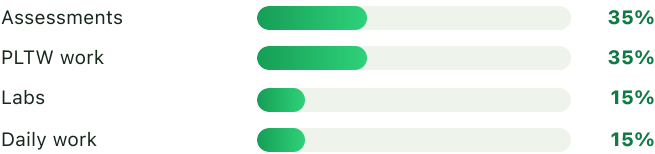
THE GRADE

How grading works

One grading system, all four courses: 35/35/15/15.

WHERE THE GRADE COMES FROM

Each course runs on 1,000 points, built so the categories land at these shares. The gradebook carries the same 35/35/15/15 weighting, so the split holds however you count it.



A 90+

B 80+

C 70+

D 60+

Extra credit offered

The final exam is a full-length, timed WebXam practice worth 100 points, the largest single assignment in the course, sat in the final week. Daily work is exit tickets, vocabulary, trackers, and the Friday reflection: one double-sided sheet each week, 16 in total for this course, worth 4 to 5 points in Daily work. Extra credit is announced in class, is available to students turning in their Friday reflections, and is capped at 20 points per semester.

THE WEBXAM RAISE

Passing the state exam raises the course grade on a tiered scale. The WebXam is scored 1 to 5: a 5 adds 30 percent to the coursework grade, a 4 adds 20, a 3 adds 10, and the result is capped at 100. The raise is a percentage of the coursework grade, not points added on: a 68 with a top score becomes an 88, which is 68 plus 30 percent of 68.

Not passing never lowers the grade. The WebXam is an on-ramp, never a trap door. State scores can return after report cards post; when that happens, the raise is still applied, you hear it from me in writing, and the corrected grade goes on the transcript.

LATE WORK AND UPDATES

Late work is accepted for two weeks after the grade posts, and never past the term's final grade deadline: work graded in the last two weeks of a term closes when semester grades are finalized. Late work without an excused absence loses 20 percent per week, compounding. The gradebook is updated at minimum every two weeks. Redos and retakes are limited and never automatic: they come after remediation, and they apply to unit tests, the final, CERs (Claim-Evidence-Reasoning write-ups, the course's evidence-based conclusions), and labs.

In this course, 13 assignments are due the morning after they are assigned, and 1 more spans a weekend. Both counts are printed on the submission calendar, so nothing about homework is a surprise.

Learning is the goal; the grade is just the evidence. Your student's report-card grade appears in Schoology, and day-to-day work lives on mendozabiomed.org, where every lesson is posted with no login.

THE STATE EXAM

The WebXam, straight

Ohio WebXam: dual-prepared for 072125, Biotechnology for Health and Disease, and 072110, Principles and Practice of Biomedical Technology. **CODE UNDER DISTRICT REVIEW** The final form is 40 items, and the blueprints below are the live ones the candidate exams are built from, so class time is spent where the points are.

WHAT THE EXAM TESTS (072125)	SHARE OF ITEMS
Molecular and Genetic Technology	27.17%
Microbiology Testing and Technology	23.91%
Laboratory Standard Operational Procedures	21.74%
Culturing	20.65%
Business Ethics and Law	2.17%
Business Literacy	2.17%
Employability Skills	1.09%
Global Environment	1.09%

THE ALTERNATIVE BLUEPRINT (072110)	SHARE OF ITEMS
Handling, Preparation, Storage and Disposal	53.93%
Biotechnology Research and Experiments	46.07%

The four business and employability outcomes on 072125 carry under 7 percent combined; the testable core of both blueprints is laboratory practice, and that is what the course drills.

Honest status: which exam BI students sit is still being confirmed with the district. Until it is, this course prepares for the shared core of both candidate blueprints on purpose, so no student is caught flat by the answer.

When the exam happens

Ohio publishes one wide WebXam window for the year, **October 12, 2026 to May 28, 2027**, and Mr. Mendoza schedules our attempts inside it. Spring courses test May 17 to 28, at the end of the term. Students also sit the exam as a pretest in week one: a baseline, taken before we have taught anything, that makes the end-of-course growth real and visible. The pretest is a separate practice sitting, not a scored state attempt; it never counts against a student.

What passing can open

Passing raises the course grade (a 5 adds 30 percent, capped at 100) and can open college credit through Ohio's CTAV process (Career-Technical Articulation Verification), which lets state public colleges award transfer credit on qualifying WebXam results reported through the district. A second, separate route runs on PLTW's own exam, not the WebXam: PLTW ACE, under which a qualifying score carries a college-credit recommendation from the American Council on Education, and the college your student attends decides whether to award it. ACE does not cover Biomedical Innovation. We do not print college names or credit counts because no signed agreement is on file; the honest framing is potential worth pursuing with the school counselor once scores are in.

EXPECTATIONS

Expectations, in and out of the lab

The same routine every day, so the energy goes to the science.

The daily rhythm

Arrive	Charged school computer, something to write with, notebook out. No fees, ever: the school provides lab materials and goggles.
Open	The day page on mendozabiomed.org shows the date, the target, and the work, side by side.
Work	Cornell notes, the PLTW activity, the lab or the learning center, with help one tap away.
Close	Exit ticket, then use the one route named under Submit here. Submitted means the upload shows its thank-you receipt or Mr. Mendoza confirms the named physical handoff.

Lab safety comes first

Before anyone touches lab materials, every student reads and signs the safety contract and passes the safety exam at 100 percent. On wet-lab days: goggles on, closed-toe shoes, long hair tied back.

Phones and focus

No phones in school; phones are away and silent in class. We protect a calm, focused room because the work deserves one.

Honest work and AI tools

The work turned in must be the student's own. Sharing lab data with a team is expected; copying another student's answers is not. AI tools are allowed only where a task says so, and never to generate an answer a student submits as their own.

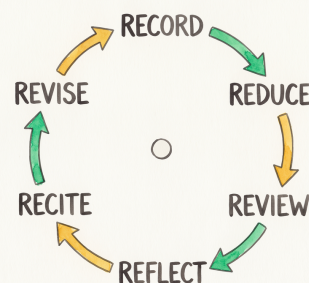
Absent? Nothing is a mystery.

The day's work is always on the website. For an excused absence, students get two school days for every day they were out to make up work and assessments for full credit, and the clock starts the day they return. See Mr. Mendoza the day you return.

The learning routine: Cornell notes and the 6 Rs

Every day follows the same rhythm so students can focus on the science instead of the logistics. Notes are Cornell style and run through the **6 Rs**: Record, Reduce, Review, Reflect, Recite, Revise. It is a habit, the same one in all four courses, and the notebook it produces is a graded artifact checked against the unit checklist.

Each lesson also carries a plain-language glossary, tap-to-hear vocabulary, WebXam practice for the day's idea, and a cumulative mixed review that keeps older units fresh.



THE SUPPORTS

Every support, one website

Everything below is free, public, and built for this course. No login, any device.

THE COURSE HUB

The course home: today's lesson, the week cards, and every support below, no login needed.

mendozabiomed.org/learn/pltw-bfh

A PAGE FOR EVERY CLASS DAY

All 61 class days have a dated page: the target, the plan, the PLTW step, what is due, and the make-up plan. The address pattern is `/learn/pltw-bfh/day/YYYY-MM-DD`.

mendozabiomed.org/learn/pltw-bfh/day/2027-01-19

CALENDAR AND DAYS OFF

Every class day, catch-up day, and no-school day on real dates, plus /days-off for the term's holidays.

mendozabiomed.org/learn/pltw-bfh/calendar

LEARNING CENTERS

56 centers for this course (265 across the pathway), each with three tiers: prerequisite, core, and advanced, with 187 practice problems for this course and verified videos. The get-unstuck-at-your-level surface.

mendozabiomed.org/learn/centers/pltw-bfh

LAB SIMULATIONS

13 simulations for this course (72 across the pathway). Completing the sim is the ticket into the bench lab: it is the pre-lab gate.

mendozabiomed.org/learn/lab-sim/bfh-water-quality

LAB MANUALS

53 student lab manuals across the pathway: purpose, procedure, figures, and the conclusion frame, ready to bring to the bench.

mendozabiomed.org/learn/lab-manuals

THE ILLUSTRATED GLOSSARY

946 terms, each with a drawn illustration, plus a word-parts tab that teaches the prefixes and suffixes medicine is built from.

mendozabiomed.org/learn/glossary

CAREER CARDS

20 biomedical careers with real numbers and the honest path to each: nurse, genetic counselor, biomedical engineer, EMT, epidemiologist, and more.

mendozabiomed.org/learn/careers

ACTIVE STUDY

The study section for this course, plus the graphs-and-data guide and the study-guides library.

mendozabiomed.org/learn/study/pltw-bfh

ANKI FLASHCARDS

710 cards for this course, 2,048 across the pathway, free to download. One tap installs the deck; ten minutes a day beats three hours the night before.

mendozabiomed.org/study-decks/PLTW_BI.apkg

SKILL HUBS

Applied Mathematics (20 topics) and ELA in Science (15 topics) at `/learn/ela-science`: the math and reading that carry the course.

mendozabiomed.org/learn/applied-math

PRINTABLES AND EXTRA CREDIT

Extra-credit reserve units with virtual labs open mid-term on the reserve track at `/learn/pltw-bfh/reserve`.

mendozabiomed.org/learn/pltw-bfh

WORKED EXEMPLARS

Day pages carry worked exemplars of what is due, at /day/DATE/exemplar, so a student can see what good looks like before they submit.

mendozabiomed.org/learn/pltw-bfh/day/2027-01-19/exemplar

THE NOTEBOOKLM NOTEBOOK

Every lesson in this course opens with one of 14 NotebookLM notebooks (also called the Gemini notebooks), from a 54-notebook library, some serving more than one course, with audio and video overviews. Start with "Course Orientation: How This Class Works and How to Study". Opening one takes a free Google sign-in.

notebooklm.google.com/notebook/976a8007-e356-40c0-8249-087fdfe66987

CLUBS AND BEYOND THE CLASSROOM

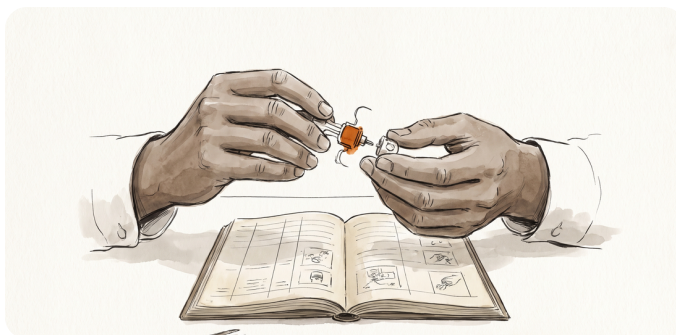
HOSA, the Youth Leadership club, Brain Stormers with Cleveland Clinic neurosurgery, the Dilemmas in Differential Diagnosis program, Cleveland Clinic onboarding, and work-based learning hours. The portal index on the next pages lists every club page.

mendozabiomed.org/learn/groups/hosa

THE THREE FAMILY ARTICLES

The combined John Hay Biomedical Family Syllabus carries three short articles worth reading together: how to study and prepare, what a semester course asks of a family, and where the WebXam can lead. Ask Mr. Mendoza for the printed copy, John-Hay-Biomedical-Family-Syllabus-2026-2027.pdf; the address below is the online how-it-works explainer.

mendozabiomed.org/learn/how-this-class-works



HOW WORK IS TURNED IN, IN FOUR STEPS

- 1 **Do the activity in myPLTW.** The project curriculum lives there; students reach it through Clever with the district sign-in.
- 2 **Use the one route named under Submit here on the day page.** A digital item uses that page's upload and the student's district Microsoft sign-in. A physical item is handed to Mr. Mendoza only when the day page names that route. Doing the activity is not the same as turning it in.
- 3 **The file lands in Mr. Mendoza's district OneDrive.** Private, and where grading happens.
- 4 **Schoology carries the report-card grade and nothing else.** Students read it there and never submit there.

Every submission lands in one of six folders: Exit Tickets, Lab Notebooks, Class Records, Data Tables, Lab Reports, and Claim Evidence Reasoning (the CER).

The printed companion is the [BI Submission Calendar](#): every due date on real dates, the same file the class website is built from.

Portal index: the map of everything

One line per page. Addresses that start with a slash live on mendozabiomed.org.

PAGE	ADDRESS	WHAT IT IS
BIOTECHNOLOGY FOR HEALTH AND DISEASE		
Course hub	mendozabiomed.org/learn/pltw-bfh	Today's lesson, week cards, every support.
Calendar	mendozabiomed.org/learn/pltw-bfh/calendar	Every class day and day off, on real dates.
Day pages	mendozabiomed.org/learn/pltw-bfh/day/2027-01-19	One dated page per class day (pattern /day/YYYY-MM-DD).
Story	mendozabiomed.org/learn/pltw-bfh/story	The course as one running story, same dates.
Comic	mendozabiomed.org/learn/pltw-bfh/comic	The graphic-novel telling of the course, week by week.
Progress	mendozabiomed.org/learn/pltw-bfh/progress	Self-tracking against the course plan.
Reserve track	mendozabiomed.org/learn/pltw-bfh/reserve	Optional extra-credit units that open mid-term.
Days off	mendozabiomed.org/learn/pltw-bfh/days-off	Every no-school day for the term.
Submission calendar	mendozabiomed.org/calendars/BI-Submission-Calendar.pdf	The printed due-date calendar the site is built from.
Learning centers	mendozabiomed.org/learn/centers/pltw-bfh	56 centers, three tiers each.
Active Study	mendozabiomed.org/learn/study/pltw-bfh	Course study tools.
Anki deck	mendozabiomed.org/study-decks/PLTW_BI.apkg	710 flashcards, one-tap install.
STUDY AND PRACTICE		
Student hub	mendozabiomed.org/learn	The front door to everything.
Active Study	mendozabiomed.org/learn/study	Study tools for all four courses.
Graphs and data guide	mendozabiomed.org/learn/study/graphs	How to build and read scientific graphs.
Study guides	mendozabiomed.org/learn/study-guides	The study-guide library.
Applied Mathematics hub	mendozabiomed.org/learn/applied-math	20 math topics that carry the courses.
ELA in Science hub	mendozabiomed.org/learn/ela-science	15 reading and writing topics, lab reports to CER.
All Anki decks	mendozabiomed.org/study-decks/PLTW_All_Anki_Decks.zip	2,048 cards, every course, one download.
REFERENCE		
Learning centers hub	mendozabiomed.org/learn/centers	All 265 centers, by course.
Centers by career	mendozabiomed.org/learn/centers/careers	The same skills, grouped by the careers that use them.
Video library	mendozabiomed.org/learn/centers/videos	Every verified center video in one place.
Illustrated glossary	mendozabiomed.org/learn/glossary	946 illustrated terms plus word parts.
Career cards	mendozabiomed.org/learn/careers	20 biomedical careers with real numbers.
Lab manuals	mendozabiomed.org/learn/lab-manuals	53 student lab manuals.
Molecular simulations	mendozabiomed.org/learn/molecular-simulations	Interactive molecular models.
Lab simulations	mendozabiomed.org/learn/lab-sim/pbs-differential-diagnosis	72 sims; address pattern /learn/lab-sim/ID.
ASSESSMENT		
How this class works	mendozabiomed.org/learn/how-this-class-works	Grading, submission, and the year, explained.
Family guide PDF	mendozabiomed.org/how-this-class-works/How-This-Class-Works-Family-Guide.pdf	The printable how-it-works guide.
Exam Answer Portal	mendozabiomed.org/exams/index.html	Where in-class assessment answers are entered.

PAGE	ADDRESS	WHAT IT IS
DDI plan	mendozabiomed.org/learn/ddi-plan	How assessment data steers reteaching. Grades live in Schoology.
SAFETY		
Safety hub	mendozabiomed.org/learn/safety	The rules, the contract, and the test.
Safety contract	mendozabiomed.org/learn/safety/contract	Read and sign before any lab.
Safety test	mendozabiomed.org/learn/safety/test	Pass at 100 percent before the bench.
COMMUNITY		
HOSA	mendozabiomed.org/learn/groups/hosa	Future Health Professionals chapter.
Youth Leadership	mendozabiomed.org/learn/groups/youth-leadership	The Buzz: public speaking and leadership.
Youth Leadership kit	mendozabiomed.org/learn/youth-leadership-kit	The club launch kit.
Brain Stormers	mendozabiomed.org/learn/groups/brain-stormers	Neurosurgery club with Cleveland Clinic, Room 381.
Differential Diagnosis	mendozabiomed.org/learn/groups/ddx	Cleveland Clinic Dilemmas in Differential Diagnosis.
Clinic onboarding	mendozabiomed.org/learn/groups/clinic-onboarding	The step-by-step Cleveland Clinic placement path.
Work Ready	mendozabiomed.org/learn/groups/work-ready	WBL hours toward the 250-hour goal, plus the skills path to the OhioMeansJobs seal.
WebXam group	mendozabiomed.org/learn/groups/webxam	WebXam progress surface.
Bioethics debate	mendozabiomed.org/learn/groups/bioethics-debate	Monthly bioethics seminars with John Carroll University.
Cancer Kids First	mendozabiomed.org/learn/groups/cancer-kids-first	Childhood-cancer service and fundraising.
Chess Team	mendozabiomed.org/learn/groups/chess	GCSCCL chess.
Membership	mendozabiomed.org/learn/membership	Join a club.
Bulletin	mendozabiomed.org/learn/bulletin	Announcements.
Discussion	mendozabiomed.org/learn/discuss	The class discussion board.
RESEARCH		
Craniofacial Research Track	mendozabiomed.org/learn/research/craniofacial	Year-long research with Dr. Atit's lab at Case Western.
Biomedical research	mendozabiomed.org/learn/biomedical-research	The research hub.
PROGRAM		
About the pathway	mendozabiomed.org/learn/about	What John Hay Biomedical is.
Site map	mendozabiomed.org/learn/map	The illustrated map of the whole site.

Every address above was checked live on August 7, 2026 and answered. Counts were measured the same day from the website's own code. If a page ever fails to load, tell Mr. Mendoza; the site is maintained weekly.

Questions? I answer families within one school day.

Email manuel.mendoza@clevelandmetroschools.org, or call the John Hay main office and ask that a message reach Room 381. Con gusto me comunico con usted en español.

Go Hornets.