

Red-Team Report

Could a student complete every task using only the materials supplied in the lesson package?

RELEASE DECISION
Ready after automated file, reading, deck, document, build, and live-route checks pass.

DISCOVERY INTEGRITY
Each lesson reveals only the evidence needed for its decision. Lesson 20 synthesizes the domain without inventing a single cause.

Audit gates

Gate	Release standard	Result
Durable idea	Every lesson names one 10-year takeaway and one of the four foundations.	PASS in authored package
Socratic sequence	Analogy image, observation questions, student rules, biology mapping, decision, defense, and handoff are present.	PASS in authored package
Closed loop	All required knowledge, evidence, definitions, visuals, and decision rules are inside the package.	PASS in authored package
Case integrity	Stable evidence IDs are used. No task requires invented or student-identifiable data.	PASS in authored package
Claim discipline	Each decision states what students may claim and what the evidence cannot prove.	PASS in authored package
Reading	Plain-language structured readings are supplied. Publication links are optional.	PASS in authored package
Alignment	Guided notes follow the deck roles and end by constructing the day's take-home.	PASS in authored package
Visual QA	Every lesson has separate analogy and biomedical illustrations with explicit educational labels.	PASS in authored package

Lesson-by-lesson dependency audit | Lessons 1 to 10

#	Take-home	Analogy	Evidence IDs	Decision	Handoff
1	A pedigree shows how a trait travels through...	A neighborhood map shows connections, not...	GEN01-E1, GEN01-E2, GEN01-E3	Choose the counseling statement and cite the...	A pedigree shows how a trait travels through...
2	A syndrome claim requires a repeatable pattern of...	One instrument or the whole musical...	GEN02-E1, GEN02-E2, GEN02-E3	Choose the chart language and cite the...	A syndrome claim requires a repeatable pattern of...
3	Most isolated clefts fit a multifactorial threshold model...	Several weights tip a balanced scale	GEN03-E1, GEN03-E2, GEN03-E3	Choose the model and cite both pedigree...	Most isolated clefts fit a multifactorial threshold model...
4	Linkage follows inherited chromosome markers to narrow a...	Track a delivery truck by the...	GEN04-E1, GEN04-E2, GEN04-E3	Choose the next step and cite what...	Linkage follows inherited chromosome markers to narrow a...
5	IRF6 encodes a transcription factor that changes cell...	A recipe card becomes a kitchen...	GEN05-E1, GEN05-E2, GEN05-E3	Choose the correction and cite gene-product and...	IRF6 encodes a transcription factor that changes cell...
6	Variant interpretation combines clinical assertions, population frequency, molecular...	A library catalog card needs several...	GEN06-E1, GEN06-E2, GEN06-E3	Choose the report language and cite review-status...	Variant interpretation combines clinical assertions, population frequency, molecular...
7	DNA variants change proteins in different ways, so...	Edit one instruction manual four different...	GEN07-E1, GEN07-E2, GEN07-E3	Choose the annotation strategy and cite two...	DNA variants change proteins in different ways, so...
8	Variant location can change mechanism: reduced dosage and...	A two-person control room can fail...	GEN08-E1, GEN08-E2, GEN08-E3	Choose the comparison and cite dosage plus...	Variant location can change mechanism: reduced dosage and...
9	A regulatory variant changes when or how much...	The machine is intact, but its...	GEN09-E1, GEN09-E2, GEN09-E3	Choose the interpretation and cite regulatory mechanism...	A regulatory variant changes when or how much...
10	Protein domains are specialized working regions, so a...	A multi-tool has separate working sections	GEN10-E1, GEN10-E2, GEN10-E3	Choose the assay plan and cite the...	Protein domains are specialized working regions, so a...

Lesson-by-lesson dependency audit | Lessons 11 to 20

#	Take-home	Analogy	Evidence IDs	Decision	Handoff
11	Evolutionary conservation marks positions that tolerated little change...	Compare many editions to find the...	GEN11-E1, GEN11-E2, GEN11-E3	Choose the classification stance and cite both...	Evolutionary conservation marks positions that tolerated little change...
12	A missense variant matters when its side-chain change...	One replacement key no longer fits...	GEN12-E1, GEN12-E2, GEN12-E3	Choose the report language and cite prediction...	A missense variant matters when its side-chain change...
13	IRF6 works in a regulatory network, so similar...	A relay team passes one signal...	GEN13-E1, GEN13-E2, GEN13-E3	Choose the next genetic strategy and cite...	IRF6 works in a regulatory network, so similar...
14	The IRF6 network helps oral epithelial cells form...	Temporary release paper protects adhesive surfaces	GEN14-E1, GEN14-E2, GEN14-E3	Choose the sequence and cite cell plus...	The IRF6 network helps oral epithelial cells form...
15	Knockout and rescue experiments strengthen causation when loss...	Remove one bridge cable, then restore...	GEN15-E1, GEN15-E2, GEN15-E3	Choose the verdict and cite both improvement...	Knockout and rescue experiments strengthen causation when loss...
16	Population differences reflect allele frequencies, effect sizes, environments...	Different gardens contain different seed mixes...	GEN16-E1, GEN16-E2, GEN16-E3	Choose the correction and cite both difference...	Population differences reflect allele frequencies, effect sizes, environments...
17	Recurrence counseling uses empiric family data and uncertainty...	A weather forecast guides planning without...	GEN17-E1, GEN17-E2, GEN17-E3	Choose the counseling approach and cite case...	Recurrence counseling uses empiric family data and uncertainty...
18	Gene editing, pathway rescue, and gene-dosage modulation are...	Repair a program by editing code...	GEN18-E1, GEN18-E2, GEN18-E3	Choose the evaluation and cite mechanism evidence...	Gene editing, pathway rescue, and gene-dosage modulation are...
19	An ethical decision weighs benefit, harm, autonomy, heritability...	A community bridge decision needs more...	GEN19-E1, GEN19-E2, GEN19-E3	Choose the panel decision and cite two...	An ethical decision weighs benefit, harm, autonomy, heritability...
20	Mateo's strongest genetic story is multifactorial and evidence-bounded...	A courtroom file separates facts, expert...	GEN20-E1, GEN20-E2, GEN20-E3	Choose the conclusion and cite case evidence...	Capstone synthesis complete.

Known limits and release receipts

- All patient imagery is explicitly educational illustration. No generated image is presented as microscopy, radiology, or a real clinical photograph.
- Typical care windows are educational examples. The site and documents state that real teams individualize timing and decisions.
- Population data describe groups and do not identify Mateo's individual cause.
- The strongest decision is the first option in the teacher guide, but students must defend it with the named evidence IDs.
- Automated validation receipts are stored with the release and are completed before publication.