Biology Lab of Horrors Teacher Guide

Five-day project for General Biology grades 9–10 with optional dual-enrollment extensions

Students create a small handmade museum exhibit that uses a Halloween theme to explain real biology. Students work individually or in pairs. Days 1, 2, 4, and 5 are 50 minutes; Day 3 is 35 minutes. Finish every graded display component by the end of Day 4.

Files to use

Start Here explains the kit. Share the Student Guide, matching Science Reference Card, and the Gallery Walk and Evaluations. Use the worked example and real Student Display Examples to introduce expectations. The Teacher Grading Checklist provides separate project and individual scores.

Printing and digital distribution

For 30 students in 15 pairs, provide 15 student packets and 30 gallery and self-evaluation sheets. Copy one peer-evaluation page per teammate per student. Print only the reference cards selected. Documents contain unruled response spaces. PDFs are for printing; DOCX files allow typing.

Research expectations with this kit

Each team uses two sources. The assigned reference card may count as Source A. For Source B, use one of its linked readings or a teacher-provided textbook section. Teacher and students should verify the specific facts used. The cards are self-contained introductions; internet access is optional when a textbook or printed reading is supplied.

Quick preparation checklist

- Review the nine reference cards and worked example. Choose the sources your students can access.
- Gather the quantities below, assign storage spaces, and copy or share student files.
- Review the teacher answers and identify misconceptions likely to arise.
- Update dates, classroom-use procedures, and any accommodations before assigning.

Teacher guide

Learning goals

- Use reliable sources to explain a biological structure or process.
- Connect at least four model features to accurate biology.
- Distinguish real science from fictional Halloween exaggeration.
- Communicate biological cause and effect to a museum visitor.

Before the project

- Choose solo or partner work and assign a labeled storage space for every exhibit. For 30 solo exhibits, double per-exhibit bases and containers.
- Gather clean recycled materials and sort shared supplies into nine category bins. Keep glue, scissors, markers, and tape at a common supply station.
- Prepare a small teacher sample with four labels. A paper mitochondrion with folded inner membrane is enough; elaborate decoration is unnecessary.
- Provide school-approved textbooks or bookmarked biology sources. Offer diagrams and short reference notes for students who need support.
- Copy the student pages and rubric. Explain that students must use two sources and record source titles, organizations, and URLs or textbook pages.
- Set up a drying shelf, a photo location, and separate storage for each class period. Check school rules before planning food or photos.

Science and materials safety

- Use only simulated microbes. Do not culture environmental samples or bring in bodily fluids, animal tissue, or real biological specimens.
- Use clean plastic containers with secure lids. Do not use glass jars, blades, open flames, or exposed sharp wire. Teacher handles any cutting tools beyond classroom scissors.
- Default to paper and clay. If a gel is used, prepare it yourself, check ingredient sensitivities, seal the container, and discard promptly after the showcase. No student mixing of borax slime is needed.
- Keep all craft materials out of mouths and away from food. Use non-toxic school-approved adhesives and paints; wash hands after construction.
- Use age-appropriate fictional horror. Avoid graphic injury, stigmatizing disease, or descriptions that identify a classmate or real patient.

Approval checkpoint

Before construction, check the four facts, the four planned labels, the science explanation, the size, and the materials. Ask: Which parts are real? Which parts are invented? What will visitors learn? Redirect inaccurate or oversized plans before supplies are issued.

Supply list and preparation

Inventory before purchasing. Quantities are planning amounts, not store price quotes. Students can complete every category with paper, cardboard, and clay; specialty materials are optional.

Supply	For 15 exhibits	Preparation
Cardboard bases or shoebox lids	15 plus 3 spares	Cut to about 12 by 12 inches; cover sharp edges
Cardstock and construction paper	60 cardstock and 100 mixed sheets	Include white for readable labels
Modeling clay or dough	2–3 pounds total	Portion about 2–3 ounces per exhibit as needed

Supply	For 15 exhibits	Preparation
Pipe cleaners	100	Fold sharp ends inward
Cotton swabs and cotton balls	100 swabs and 1 bag balls	Portion into small trays
Tissue paper or scrap yarn	1 mixed pack each	Cut small starter pieces
Clean plastic containers with lids	8–10	For microbes and ooze; paper circles can substitute
White glue and glue sticks	6 bottles and 15 sticks	Check caps and place on trays
Tape	4 rolls	Set at shared supply station
Scissors and markers	15 scissors and 6 marker sets	Count before and after each period
Labels and student copies	15 sets plus 30 gallery sheets	See Start Here
Storage trays or bags	15 per class period	Label with names and period
Cleanup supplies	Paper towels and scrap bin	Keep wipes and handwashing available

Optional additions

Googly eyes, beads, craft sticks, LED tea lights, and recycled packaging can add character. None are required or graded by cost. Skip real pumpkins, food-based models, and wet paint when storage or drying time is limited.

Daily preparation

Day 1: Put out choices, sources, and planning sheets. Day 2: Set out labeled trays and portioned supplies. Day 3: Put out reference cards, precut label tabs, and models before class. Day 4: Provide museum-card templates and peer-review prompts. Day 5: Number exhibits and provide gallery sheets, private evaluations, and voting slips.

Teacher pacing guide

Day	Minutes and actions	Checkpoint
1	5 introduce; 10 review choices; 10 focused research; 20 complete facts and sketch; 5 approval	Two sources started, four facts and four planned labels
2	5 safety; 35 build; 5 partner accuracy check; 5 photograph and clean	Main model about 75 percent complete
3	4 retrieve and select features; 3 label example; 12 draft labels; 6 accuracy check; 6 revise and attach; 4 teacher checkpoint and cleanup	Four accurate labels placed on model or approved sketch; museum card finished Day 4
4	5 model details; 15 museum card; 10 peer review; 10 revise; 5 set up and rehearse; 5 clean	Every graded display component finished

Day	Minutes and actions	Checkpoint
5	5 open; 20 gallery walk; 10 private self/peer evaluations and voting; 10 celebration; 5 cleanup	Collect individual gallery work and score exhibits

Research support

Keep research to the biology needed for the model. Use a textbook, university, museum, public health agency, or established science education source. A search snippet, image caption, or AI-generated answer is a starting point to verify, not a source by itself. Students should paraphrase and trace each fact to a source.

Differentiation

- Provide a short teacher-selected reading and a labeled diagram for each category. Let students use paper cutouts instead of sculpting.
- Offer sentence starters: This structure helps the cell by…; In a real organism…; Our fictional feature exaggerates…
- Allow typed, dictated, or teacher-scribed explanations. Keep the same science goals and accept accessible model formats.
- For dual enrollment enrichment, request one molecular mechanism, a documented example, and a stated model limitation. Use the same 50-point rubric; do not add hidden requirements.

Museum logistics

During the 20-minute gallery walk, partner A hosts for 10 minutes while B tours, then switch. Solo creators may post an explanation or arrange a host break. Students visit three exhibits and ask a host a question when available. If a host is absent, they identify the museum card as their source. Voting awards do not affect grades.

Assessment

Score the group project out of 50: accuracy 15, model 10, labels 5, research 10, museum card 5, and creative science connection 5. Record the individual work evaluation separately out of 10. Gallery work and peer reports provide evidence; they are not a hidden deduction from the project score.

Teacher science checks

Category	Check for accurate biology	Common correction
Organelle Asylum	Real organelle function and structure; abilities clearly fictional	Mitochondria convert energy in fuels into ATP; they do not create energy
Microbial Graveyard	Shape, margin, elevation, pigmentation; bacterial binary fission	Colony appearance alone cannot identify a species or prove danger

Category	Check for accurate biology	Common correction
Anatomy Crypt	Four correctly positioned structures and how they work together	A model must show function as well as name parts
Mutation Station	Specific DNA change and plausible protein or trait effect	Mutations can be neutral, harmful, or beneficial; not every mutation changes a protein
Diseased Tissue Gallery	Comparable healthy and altered tissue with functional consequence	Cancer is abnormal cell regulation; sickled red cells are not an example of cancer
Cell Death Cemetery	Apoptosis versus necrosis and causes or contexts	Apoptosis is regulated fragmentation; necrosis often involves swelling and rupture
Carnivorous Greenhouse	Photosynthesis plus nutrient acquisition and two adaptations	Carnivorous plants obtain mineral nutrients from prey and still photosynthesize
Biological Ooze Collection	Composition, producer, and function of mucus, biofilm, or matrix	Mucus is not a microbe; a biofilm includes microbes within an extracellular matrix

Quick teacher prompts

- Show me the model feature that supports this fact.
- What happens first, and what happens because of it?
- What is exaggerated in your horror story?
- What can this model show well, and what can it not show?

No internet alternative

Provide textbook pages or printed references about the selected topic. Students list the book title and page numbers for two relevant sections or use a second teacher-provided reference. If only one source is available, announce an adjusted source expectation before work begins.

End of project

Photograph exhibits only under school policy. Return reusable materials, remove names before any public sharing, and discard sealed gels without opening them in class. Students keep dry models or recycle paper and cardboard. Save a few anonymous examples for next year.

Reference card teacher answers

1 The Organelle Asylum

Check question: Why do folds matter in a mitochondrion?

Expected answer: They increase inner membrane area for proteins involved in ATP production.

2 The Microbial Graveyard

Check question: Can a scary-looking colony prove that a bacterium causes disease?

Expected answer: No. Appearance alone does not establish species identity or disease-causing ability.

3 The Anatomy Crypt

Check question: Why does a heart model need arrows as well as chamber names?

Expected answer: Arrows communicate the direction of blood flow and show how the chambers work together.

4 The Mutation Station

Check question: Does every mutation change an amino acid?

Expected answer: No. Some coding substitutions are synonymous, and many mutations occur outside coding regions.

5 The Diseased Tissue Gallery

Check question: Does every tumor invade nearby tissue?

Expected answer: No. Benign tumors do not invade or metastasize. They may still cause serious problems.

6 The Cell Death Cemetery

Check question: Why can membrane rupture affect neighboring tissue?

Expected answer: Released cell contents can activate inflammation and affect surrounding cells.

7 The Carnivorous Greenhouse

Check question: Why does capturing insects not replace photosynthesis?

Expected answer: Prey primarily supplements mineral nutrition. Photosynthesis supplies the plant's organic carbon compounds.

8 The Biological Ooze Collection

Check question: Are mucus, biofilm, and animal extracellular matrix the same thing?

Expected answer: No. They differ in composition, producers, and functions, although each involves extracellular material.

Assessment and classroom adaptation

Scoring consistency

Use the same 50-point project checklist for each category, plus a separate 10-point individual evaluation. Optional extensions do not add hidden requirements. The worked example demonstrates one possible response. Peer ratings support teacher judgment; do not automatically average them into a grade.

Support options

- Supply a diagram, read the reference card aloud, and allow speech-to-text.
- Let students describe labels through recorded audio when writing is a barrier.
- Use a smaller paper model while keeping four accurate features.
- For advanced students, add a molecular mechanism and one model limitation.

Before sharing student work outside class

Use only examples you have permission to share. Follow district requirements for public sharing of student-created work and photographs. Remove identifying information. Teacher-made illustrations in this kit are examples, not photographs of student work.

Final schedule and support notes

The 35 minute label lesson

Day 3 focuses on four biological labels rather than new decoration. Each label names a feature and explains its function or meaning. If a model is unfinished, place labels on the approved sketch or beside the unfinished portion; complete essential construction on Day 4. See the Daily Checklists and Supports for chunked tasks.

Research submission

The completed research sheet is sufficient for the core project. If assigning a separate research paper, explain length and format before Day 1. Grade either submission using the same 10-point research category; do not require an unannounced additional paper.

Photographs as examples

The four supplied photos document student-made displays. Bicephaly and Tissue Culture Gone Wrong are examples of teacher-approved alternatives. They do not add new mandatory exhibit categories. Discuss model limitations, and use the edited captions rather than assuming every student-written label in a photo is fully accurate.

Private evaluations

Collect self- and peer-evaluations privately. Use reported contributions, teacher observations, and each student's biological explanation together. Consider absences and accommodations. A peer's low score alone should not determine a student's grade.

Station 9 Nature’s Monsters

Students choose a real organism and explain how an unusual adaptation supports survival or reproduction. The reference card models a tongue-replacing isopod and links to anglerfish and parasitoid-wasp readings. Use paper, cardboard, clay, and yarn; no live organisms or preserved specimens are needed. Plan one additional category tray if offering all nine stations.

Check question: Why is the isopod–fish relationship parasitism rather than mutualism? Expected answer: The isopod gains food and a place to live and reproduce, while feeding damages the fish. Keep the science separate from any fictional warning.

Choice board for absent students

Assign file 07 Absent Student Alternative. Students choose one of six formats and one of the nine biology topics, including Nature’s Monsters. Provide the matching reference card and a second accessible source. Allow about 60–90 minutes across two sessions, with a due date based on available work time. No physical display, group ratings, or gallery visits are required.

Use the alternative’s own common requirements and 50-point scoring checklist, plus its separate 10-point individual evaluation. A self-check replaces collaboration. Do not also require the physical exhibit or the former two-page case-file assignment. Offer one work chunk at a time, outlines, word banks, speech-to-text, or scribing as needed.