

Wk12 Exit ticket: Animal research ethics debate

Your goal: Debate the ethics of using model organisms like *C. elegans* in human-health research.

One product: Written personal stance on using *C. elegans* in research, citing one justification and acknowledging one genuine ethical concern.

Question: What could justify using a simpler living model, and which concerns would remain?

Start the work

1. Read a short prompt on why scientists use model organisms.
2. Form groups representing researchers, ethicists, and patient advocates.
3. List two justifications and two concerns about animal models.
4. Exchange one rebuttal with an opposing group.
5. Write your personal stance with one supporting reason.

If access is unavailable, save the same work and tell the teacher. Use the solo rebuttal for practice. Ask for any assigned classmate-reply route and official prompt before doing that work.

Words you will use

model organism

An organism used to study a biological process that can inform questions about other organisms.

C. elegans

Caenorhabditis elegans, a small roundworm used in biological research.

invertebrate

An animal without a backbone.

vertebrate

An animal with a backbone.

gene

A DNA sequence that contributes to a functional product, such as a protein or RNA.

biological pathway

A connected series of molecular events in a cell or organism.

conserved biology

Biological features shared through evolutionary history; shared does not mean identical.

apoptosis

A regulated process of cell death.

translation

Applying findings from one research setting or species to another; it requires additional evidence.

ethics

Reasoning about what should be done and why.

stakeholder

A person or group whose interests or responsibilities relate to a decision.

researcher

A person investigating a question using systematic methods.

ethicist

A person who examines ethical reasons, principles and consequences.

patient advocate

A person representing patients' interests; the classroom role does not represent actual patients.

justification

A reason supporting a choice or stance.

concern

A meaningful possible cost, objection or unresolved issue.

rebuttal

A response that addresses an opposing argument with reasons.

tradeoff

A choice involving competing benefits, costs or principles.

stance

Your stated position on the question.

evidence

Information that supports a factual claim and can be checked.

value

A judgment about what matters, such as protecting life or gaining knowledge.

uncertainty

Something not established by the available information.

PHS

Public Health Service; the named policy concerns covered research involving live vertebrates.

institutional oversight

An organization's process for reviewing and monitoring work under applicable rules.

replacement

Avoiding or replacing animal use with a suitable way to answer the question.

reduction

Using fewer animals while preserving the scientific purpose and sound design.

refinement

Improving animal welfare and minimizing potential research-related harm.

3Rs

Replacement, reduction and refinement in animal research; separate from the class learning 6 Rs.

E1: a useful model is not a human replica

C. elegans is a small roundworm, an invertebrate. Scientists use model organisms to study life processes that can share features with other species.

NIH describes research in *C. elegans* that helped find genes regulating apoptosis, a controlled process of cell death. Related biology can guide questions about human cells.

The NIH example also reports a worm protein involved in nerve repair. In that 2015 account, whether the human protein could perform the same repair was still unknown.

This is a historical example of the translation limit, not a claim that the question is still open today. Shared biology supports further study. It does not guarantee a treatment for people.

For the prerequisite, picture two related cell-death systems, one in a worm and one in a human. Similar components are a reason to study a mechanism, not proof of identical responses.

E2: what the NIH policy covers

NIH's PHS Policy defines covered animals as live vertebrates used or intended for research, training or biological testing. Its scope includes PHS-conducted or supported activities.

The policy requires covered institutions to maintain animal-care programs and oversight by the institution. It also preserves applicable stricter state or local rules.

C. elegans has no backbone. Do not claim this policy's vertebrate definition itself requires federal worm-study approval. It also does not grant permission for a school experiment.

School and lab rules, classroom rules and the assigned protocol still need to be checked. Ethical duties can extend beyond the animals named in one policy.

Use this source to tell apart a policy requirement from an ethical argument. A legal category does not settle whether a proposed use is morally justified.

E3: the research 3Rs

Replacement means avoiding or replacing animal use where suitable alternatives can answer the research question. Reduction means using fewer animals consistently with the scientific aim and sound design.

Refinement means improving welfare and minimizing possible pain, suffering, distress or lasting harm in animal research. These are the research 3Rs, distinct from the class learning 6 Rs.

Apply the ideas concretely: assess existing data or non-animal methods. Justify animal numbers. Review how the proposed work can avoid needless harm. No experimental procedure is supplied here.

The framework can improve a plan without settling every objection to using animals. It does not prove worms experience harm exactly like vertebrates or that all ethical concerns disappear.

S1: original discussion prompt

Fictional plan: a lab wants to use 2,000 *C. elegans* to study a cell-death pathway with related components in humans. The project would raise worms and end their lives.

The lab seeks basic knowledge, not a promised cure. No experimental results, human benefits, reason for the animal number or check of non-animal alternatives are supplied.

Decide whether this plan should proceed, be revised or be rejected. You may also oppose animal use in principle, provided you explain your reason and address a strong counterargument.

The question is whether this simpler organism is justified over more complex animals for this purpose. Simplicity alone does not prove suitability, absence of harm or automatic ethical permission.

This is a paper discussion only. No animals are acquired, handled or tested. Use E1-E3 to separate science facts, uncertainty, policy scope and values.

R1: three complete stakeholder role cards

Researcher role: prioritize an answerable question about cells and reliable methods. Possible reason 1: shared cell-death biology makes mechanism research relevant. Reason 2: a simpler model may help isolate part of a complex process.

Researcher concerns: the result may not transfer to humans, and an unjustified number or weak design can waste animal lives without useful knowledge. Ask what question requires living worms and how the number was chosen.

Ethicist role: examine the reasons for imposing costs on living subjects. Possible reason 1: carefully limited knowledge gains might justify some use. Reason 2: a suitable alternative to a more complex animal may reduce some ethical burdens.

Ethicist concerns: killing animals can remain objectionable even without a proved human-like pain experience, and missing alternatives analysis weakens a necessity claim. Ask which costs the 3Rs address and which values remain unsettled.

Patient-advocate role: examine possible value while resisting promises unsupported by evidence. Possible reason 1: basic research can find questions relevant to human biology. Reason 2: learning about a mechanism before human testing can inform later research choices.

Patient-advocate concerns: worm results do not promise clinical benefit, and resources spent on a poorly justified model may delay other useful approaches. Ask what the study can establish and what later evidence would be needed.

These cards offer arguments, not fixed beliefs of real groups. A researcher, ethicist or patient advocate may support, oppose or request revision. Prepare two reasons and two concerns even if your personal stance favors one side.

O1: opposing statements and rebuttal inputs

Conditional-support statement: shared cell-death biology gives the question value, so consider the worm study if alternatives and numbers are justified. Serious objection: this plan has not yet supplied either reason.

Opposition statement: intentionally ending animal lives for unclear benefit is unjustified to me. Serious objection: rejecting every animal model may foreclose some useful knowledge about life. Explain why your principle still governs.

Revision-first statement: examine existing data or non-animal approaches before deciding on living worms. Serious objection: those approaches may not answer a whole-organism question. Find what evidence would settle suitability.

In the live debate, record the actual opposing claim and answer it with one fact or stated value plus a limit. Address the argument rather than the speaker.

If alone, select an O1 statement that challenges your initial view, label it supplied practice opposition, and write a rebuttal. This completes original practice, not an actual group exchange or classmate reply.

C1: preparation, stance and self-check

Answer both warmups: why might scientists study a worm before human patients, and what ethical concern might someone have about animal use? You may discuss an ethical principle without sharing personal experience.

For your assigned role, list two reasons and two concerns. State your strongest argument and the best objection to it. Use at least one E-card fact and label any uncertainty.

Write the final exit stance in your own voice: I support, oppose or would revise this use because _____. A genuine concern with my position is _____. I address it by _____, while recognizing _____.

A reason supports your chosen stance. It need not favor animal use. A genuine concern challenges your position in a way a reasonable opponent would recognize.

Self-check: name one science-based reason *C. elegans* can inform human research and one remaining ethical concern. Check that your reason cites a specific E-card fact and that your concern is one a reasonable opponent would recognize.

Extension: apply replacement, reduction and refinement to S1. Explain whether each reduces a clear concern, leaves it open or cannot yet be judged from the given facts.

Quality criteria: correct source use, two points per side, a fair rebuttal, a reasoned personal stance and a genuine concern. Support, opposition and revision-first positions are evaluated by these same criteria.

P1: actual discussion and course obligations

Join a researcher, ethicist or patient-advocate group if available. If alone, choose one role and use R1/O1 for the full practice route. Pair-share the final stance if possible. Otherwise read and check it yourself.

The daily async debate asks two points per side on using the simpler organism. Log two reasons and two concerns. You may also be asked to reply to one classmate's actual posted rebuttal.

When the assigned discussion is available, read the real post and submit your actual reply. If the classmate reply is unavailable, draft the O1 practice rebuttal and ask how to access the assigned reply. Do not invent a post or response.

Nothing new in myPLTW today; write the exit ticket and open Lesson 2.3. Your teacher may also assign a Problem 2.3.1 ethics activity or reflection.

Ask your teacher where to stop today. Opening a lesson or finishing this discussion cannot mark the full official project complete. Ask whether a specific ethics screen or reflection is assigned.

Problem 2.3.1 Toxic Relationships is a broader C. elegans environmental-toxicology study with background research, question, hypothesis, variables, controls, actual data, error notes, graph and scientific report.

The actual Module II guide, culture preparation, materials, rubric and teacher direction remain needed for that project. None is supplied or completed by this paper debate.

This week's evidence remains the endocrine organizer, model and 2.2.1 evidence. Ask your teacher whether research planning and 2.3.1 design work is also due.

The upcoming research unit also needs definitions of assay, variable, control and sample size, a supplied literature claim/method, a research question and poster outline. Those later planning tasks remain separate.

April 5's glucose CER and older endocrine work are not assumed complete. No homework is due before this class. The dated weekend tracker/evidence submission belongs in Class Records.

Submit Wk12 Exit ticket: Animal research ethics debate in your enrolled section: 1292

<https://clevelandmetro.schoology.com/assignment/8544584967> ; 6792

<https://clevelandmetro.schoology.com/assignment/8544584995> . Confirm live access.

Keep your two-sided notes, rebuttal and stance together. Save the work if submission is unavailable. Keep evidence from an actual discussion reply, the official assignment and the tracker separate.

M1: distinct worked stance, a fictional plant survey

Fictional choice: a field team can first inspect existing photographs to estimate plant cover, or collect plants for a new survey. The photographs' date and coverage have not been checked.

Worked stance: I would review the photographs first because that may answer the question without removing plants. A genuine concern is that old or incomplete images could mislead the survey.

I would check image dates and coverage before relying on them. If they cannot answer the current question, my first choice needs a new look. This is a stance with conditions, not evidence that the photographs are adequate.

The model shows stance, reason, serious concern and response. It does not decide animal ethics for you or claim the animal-research policy covers this plant example. Use S1/E1-E3 for your own exit ticket.

Try the decision

Which statement respects the evidence and policy boundaries, regardless of your ethical position?

- Shared biology can justify investigating a question, while ethical acceptability and human translation still need separate arguments.

- Because the PHS definition covers vertebrates, no ethical or classroom rules can apply to worms.
- A shared cell-death pathway proves the proposed worm study will produce a human cure.

Explain your choice using the reading. Discuss it or say it to yourself. This practice does not add another submission.

Your 80-minute flow

0–8 minutes	Read the short prompt, orient source cards and take a stakeholder role.
8–22 minutes	Use R1/E1-E3 to prepare two justifications and two concerns.
22–40 minutes	State the strongest role argument and hear opposing views; alone, write using O1.
40–55 minutes	Exchange a rebuttal or answer supplied O1 opposition as solo practice.
55–70 minutes	Write a personal stance with justification and genuine concern; extend with 3Rs if ready.
70–80 minutes	Pair-share or self-check, answer the self-check, submit or save if access fails, then check Schoology after uploading.

Your response record

Use these labels on paper or in your document. The space below also works when this page is printed.

Read and take a role

Read S1 and E1-E3, answer both C1 warmups and choose or receive one R1 role.

Use a stakeholder lens without pretending to represent actual patients or researchers.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

Prepare two points per side

Write two justifications and two concerns, naming a source fact, uncertainty and value where relevant.

R1 supplies complete options for all three roles. Even a strong personal view must engage both sides.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

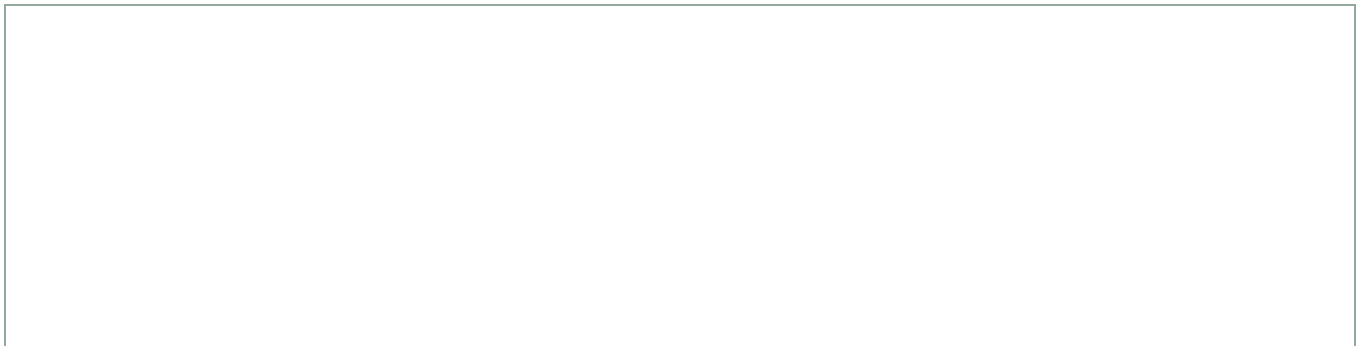


State the strongest argument

Present your role's strongest argument and identify its best objection. If alone, write the argument and objection using O1.

A categorical objection can be reasoned; do not dismiss it merely for opposing animal use.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

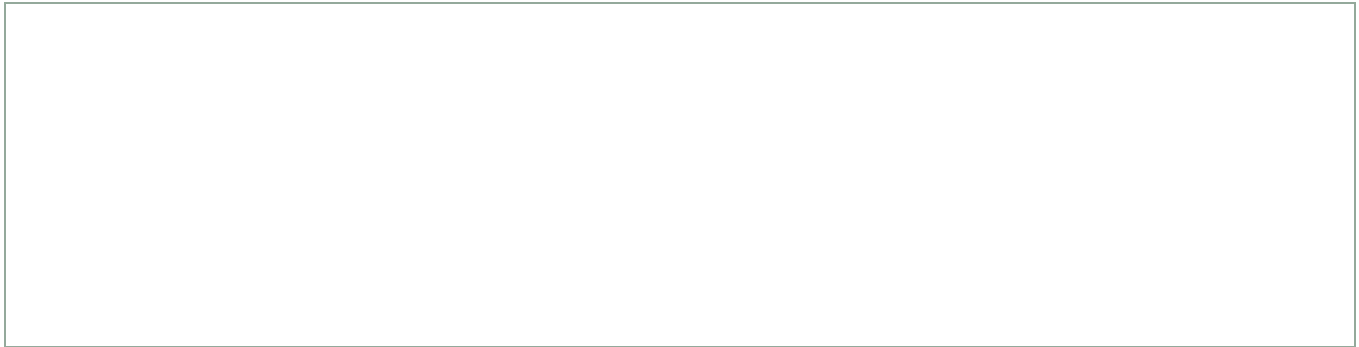


Answer an opposing claim

Exchange one actual rebuttal with another group, or complete the labeled O1 solo practice response. Use a classmate reply only after it is posted; ask the teacher if you cannot access the reply.

Name the claim you are answering, then give a reason and limit. Supplied opposition is not a real classmate post.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

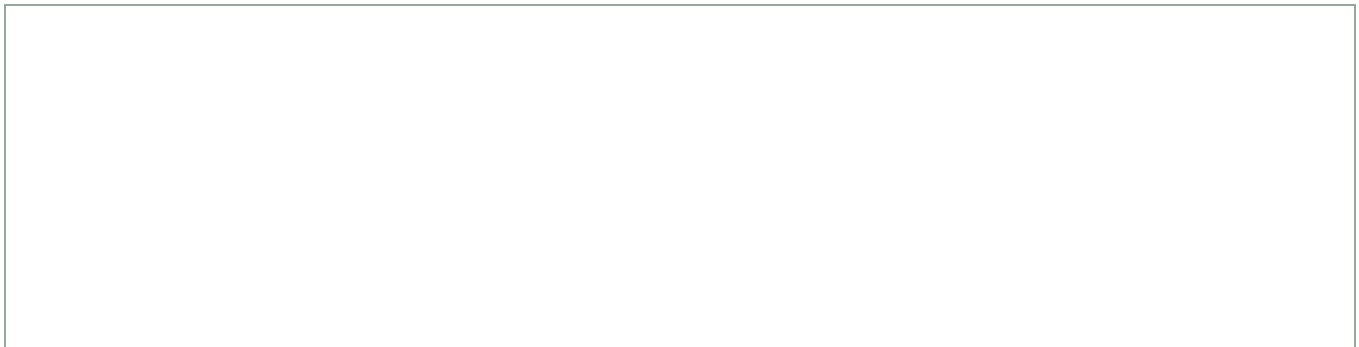


Write your personal exit stance

State your position, one supporting justification and one genuine ethical concern. Explain how you address the concern and what remains unresolved.

C1 gives a sentence structure. Your personal position may differ from your assigned role; no stance earns credit merely for agreeing.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Check, share and submit

Answer the biological-reason/ethical-concern self-check, pair-share or self-review, and submit the exit ticket. Apply the 3Rs extension if ready; record authentic holds.

PHS vertebrate scope does not authorize worm research. Opening myPLTW is not completion of the larger experiment.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

Check your product

- Two justifications and two concerns are documented.
- The rebuttal addresses a genuine opposing argument.
- The personal stance includes a reason and a meaningful ethical concern.
- Biological relevance, ethical values and policy scope remain distinct.

Keep the limit: Original classroom debate only. Shared worm biology cannot guarantee human outcomes; PHS live-vertebrate policy does not itself impose worm approval or authorize experiments. No actual study, classmate response or official completion is invented.

Turn in your work

Submit the personal stance with one justification and one genuine ethical concern through your enrolled section: 1292 <https://clevelandmetro.schoology.com/assignment/8544584967> ; 6792 <https://clevelandmetro.schoology.com/assignment/8544584995> . Keep preparation and rebuttal notes with it; confirm live access.

If access is unavailable, save the same work and tell the teacher. Use the solo rebuttal for practice. Ask for any assigned classmate-reply route and official prompt before doing that work.

[Section 1292: Wk12 Exit ticket: Animal research ethics debate](#)

[Section 6792: Wk12 Exit ticket: Animal research ethics debate](#)

Carry forward

Use shared biology to explain scientific relevance, then state the ethical cost and the limits of that evidence.

Keep the stance and rebuttal for the tracker; actual research design, source excerpt and experiment remain separate. Which ethical condition would need to be met before an actual study could proceed?

Sources and resources

[Open today's page](#)

NIH-PHS · PHS Policy on Humane Care and Use of Laboratory Animals

NIH Office of Laboratory Animal Welfare

<https://grants.nih.gov/policy-and-compliance/policy-topics/animal-welfare/laws-regulations/phs-policy>

NIH-CELL · Surprising Role for Protein Involved in Cell Death

NIH NIGMS, archived 2015 research explanation

<https://nigms.nih.gov/biobeat/2015/03/surprising-role-for-protein-involved-in-cell-death>

NC3RS · The 3Rs

UK National Centre for the Replacement, Refinement and Reduction of Animals in Research

<https://nc3rs.org.uk/who-we-are/3rs>