

Innovation debate

Your goal: Debate which criteria should decide whether a medical innovation is worth pursuing.

One product: CER contribution arguing the most important criterion for evaluating a medical innovation, plus two questions and a reflection connecting the criterion to your proposed innovation.

Question: Which criterion should lead the decision to develop the proposed aid, and what evidence could change that priority?

Start the work

1. Prepare two questions about evaluating a medical innovation.
2. Draft a CER position on the most important decision criterion.
3. Debate with peers and record an opposing criterion.
4. Connect the criterion to your own proposed innovation.
5. Submit two questions, one CER contribution, and a reflection.

If access is absent, save the same record and a reply plan. Ask for what you need for actual posting/reply, credit policy and official activity.

Words you will use

innovation

A new or changed approach intended to meet a need.

medical innovation

A new or changed approach intended to address a health-related need; an idea alone proves no benefit.

criterion / criteria

A goal used to judge a design; criteria is the plural.

constraint

A limit the design must respect, such as available time or a required safety condition.

feasibility

Whether an idea can realistically be developed within its constraints.

impact

The intended size and kind of benefit or harm; intended effects still need evidence.

safety

Avoiding or reducing risk of harm.

equity

Fair consideration of differing needs, access and burdens.

stakeholder

A person or group affected by the design or decision.

tradeoff

A choice where improving one goal may make another harder to meet.

priority

A criterion given greater weight for a stated decision.

go-or-no-go decision

A choice to advance, revise or stop a proposed stage of work.

prototype

An early model used to explore a design; it is not proof of clinical performance.

usability

How users interact with a design in its intended context.

user interface

The parts and information through which a person interacts with a device.

use-related risk

Potential harm linked to how a person uses a design.

observation

A recorded feature or event, including something directly inspectable in a supplied document.

teaching model

An invented or simplified representation used for learning.

decision

A chosen action or priority based on reasons and values.

evidence

A source-backed fact or clearly labeled record that supports a limited claim.

value judgment

A choice about what should matter; evidence informs it but does not settle every priority.

CER

Claim, Evidence, Reasoning: a position, its support and the explanation linking them.

claim

The position you defend for the specified decision.

reasoning

Why the evidence supports the claim.

opposing criterion

A different priority that challenges your chosen priority.

counterargument

A reasoned challenge to your position.

reflection

An explanation of how you apply, keep or revise your thinking.

limitation

A boundary on what the available evidence can establish.

validation

Testing whether a design supports its intended use; this lesson supplies no such result.

comparison control

A reference condition used to help isolate what differs in a comparison.

reliability

How consistently a design performs its intended task under stated conditions.

risk

The possibility of harm, considering its likelihood and seriousness.

E1: the engineering decision rule

NGSS HS-ETS1-3 calls for judging solutions using evidence, ranked criteria and tradeoffs. It includes limits such as cost, safety and reliability, along with social and other impacts.

For this debate, choose one criterion to lead the next design decision. Explain why it leads in this case, rather than declaring it best for all innovations. Other criteria and necessary constraints still matter.

Criteria describe success. Constraints set boundaries. A team might rank ease of use as a goal while treating a teacher-set ban on testing with patients as a constraint. Ranking one criterion does not remove that boundary.

E2: why the user and context matter

FDA describes human factors as the study of interactions between people and devices. Users must perceive information, interpret it and act. The interface includes controls, labels and training materials.

The goal includes reducing use-related risks and checking whether people can use the device safely and effectively. A clear-looking sketch alone does not show that these goals were met.

This source helps justify examining an aid in its intended context. It does not validate S1, rank all innovation goals for you or establish any clinical outcome.

S1: original planning case and complete recovery idea

Fictional design brief: a team proposes a reusable, large-print appointment-preparation card with an optional audio version. It would help a person organize questions before a healthcare visit. It gives no diagnosis or treatment instruction.

The paper concept can work without a phone; audio access would depend on a compatible device. These are stipulated design features, not findings from users. No costs, completion times, user tests or health outcomes are supplied.

The next decision is whether to develop a classroom mock-up and which criterion should lead that work. The supplied constraints are to use invented questions only, collect no personal health information and make no clinical-use claim.

Feasibility may favor a simple paper mock-up. Equity may favor keeping paper and audio access open. Safety may favor checking that the wording is not mistaken for medical advice. Impact may favor first testing whether the aid meets a real need.

These are possible reasons to investigate, not proven benefits. You may rank any of the four criteria if your reasons fit this limited decision. No actual patient, classmate or stakeholder statement is supplied.

R1: warmups, sorting and two questions

Warmup one: state one rule you can defend from E1 or E2. Warmup two: name a finding that would make you weaken or revise that rule's application to S1.

Sort these three supplied statements as observation, teaching model or decision. A: the E1 source lists safety among design constraints. B: the S1 team proposes a paper card and optional audio. C: equity should lead this team's next step.

Self-check: for each statement, ask whether it reports what a source says, describes an invented design, or chooses what should happen. A document observation is not a patient outcome. Keep these evidence levels separate in your CER.

Write two distinct questions of your own about evaluating the innovation. One should ask what evidence would help compare criteria. The other should ask whose needs or burdens could change the priority. Do not write answers as if missing tests had happened.

C1: debate and serious opposing priorities

Prepare a CER contribution choosing the most important criterion for S1 or your documented idea. Cite at least two evidence IDs, apply E1's rule and state one limitation. E1 and E2 can supply the required source facts; S1 supplies case features.

During the debate, record an actual opposing criterion, its reason and your reply. If working alone or absent, label this supplied challenge as solo practice: feasibility should lead, since an idea that cannot be built cannot help anyone.

If feasibility is your own priority, use this other challenge: equity should lead, since a workable design can still leave out intended users. Answer the strongest relevant challenge; do not fabricate peer words or attendance.

Remediation frame: E1 shows _____. E2 helps explain _____. Therefore I can claim _____, but I cannot claim _____. Expand the frame into the full contribution, two questions and reflection.

The async requirement remains your own written CER post and one reply to an actual classmate. A solo challenge can support practice, but cannot count as a reply to a classmate. Save a reply plan and ask for board access before completing the live reply.

A1: reflection on your own proposed innovation

Name your own proposed innovation and its intended users without personal health details. State which criterion you rank first, how it changes one design choice and whether the opposing criterion changed your thinking.

If you do not yet have an idea, explicitly adopt S1 as your tentative proposal for this original practice. Choose a specific next design choice, such as keeping the paper route or revising the wording. Explain your own reason.

This gives you a complete original reflection route, but it does not prove that an earlier proposal or official design brief exists. Ask for teacher confirmation or the required independent idea when needed.

Extension: name one additional measurement, comparison control or stakeholder perspective that could change your decision. State what result would change the priority and which stronger claim it still would not support.

For example, a later approved usability comparison could examine whether intended users understand two wording versions. A better result for one task would not by itself prove improved health. No testing occurs or is authorized here.

P1: dated course and access dependencies

Today is Wednesday, March 17, 2027. Today's task is a CER on innovation criteria.

Confirm participation, the assignment and any credit rule with the teacher. This original practice grants no points and completes no unseen activity.

Check Problem 2 analysis separately: the actual March 11 graph, March 12 spreadsheet and March 16 mini-report are not completed by this debate.

Ask your teacher which other work is also due; keep that work separate.

The innovation unit also includes a problem statement, three criteria, two constraints, stakeholder tradeoff, labeled sketch and feasibility rating. Its course-shell design brief remains a separate requirement, not an extra product silently completed today.

The next dated task is Thursday, March 18 problem definition, followed by March 19 proposal work. No homework is due before this class; March 19 preparation stays on its own date.

For posting, use the teacher-confirmed assignment. If access or an actual classmate post is missing, save the same two questions, CER and reflection locally. Check your post, classmate reply and official work separately and ask for what you still need. Open the linked BI assignment and follow its posted instructions.

X1: self-check and restart

Self-check case: one classroom mock-up looks clear, so a writer concludes it will help all patients. Before accepting the claim, name the source and comparison, apply E1/E2 and state the limitation.

Decide what the mock-up can support and which missing evidence blocks the claimed patient benefit. More confidence or polished wording cannot supply that evidence.

Restart with the first unfinished piece: two questions, criterion claim, evidence and reasoning, opposing criterion and reply, reflection, then check whether Schoology shows Submitted. End by naming the evidence ID that most limits your claim.

M1: different worked example, a clinic supply organizer

Original fictional example: a team proposes labeled compartments for unused clinic supplies. No products, staff reports or infection results are supplied. The next step is a paper layout, not clinical use.

Worked claim: usability should lead this layout stage. E1 supports ranking criteria with tradeoffs; E2 points to how users read labels and act. I would first compare whether the proposed label groups make sense in the stated task.

Counterargument: feasibility should lead because the organizer must fit available space. Reply: retain fit as a constraint while checking the label design. Neither priority can prove the organizer safe for clinical use.

Worked reflection: for this tentative organizer, I would revise ambiguous labels before adding more compartments. My limitation is the absence of user testing. A later approved comparison could change the priority, but the sketch alone establishes no benefit.

Use this structure with S1 or your own documented idea. Do not reuse the organizer as if it were a tested medical product.

Try the decision

Which statement respects the evidence level while choosing a priority?

- Rank a criterion for S1, explain it with E1/E2, and identify the missing evidence that could change the decision.
- Call the concept effective because it looks clear and includes audio.
- Refuse any provisional priority until all clinical outcomes are known.

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

Your 80-minute flow

0–10 minutes	Read definitions and E1/E2; answer warmups and sort R1.
10–25 minutes	Read S1 and draft two questions plus the initial CER.
25–55 minutes	Argue a criterion, record the strongest opposition, reply and revise with E1/E2.
55–65 minutes	Use A1 to connect the criterion to one proposed design choice.
65–77 minutes	Complete and save or post the two questions, CER and reflection; reply to one actual classmate when available.
77–80 minutes	Answer X1 and identify the next missing input.

Your response record

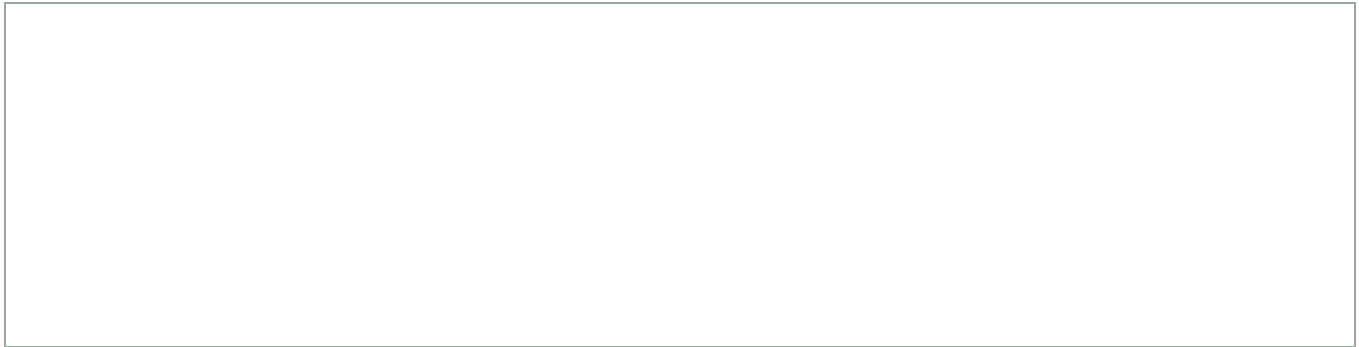
Use these labels on paper or in your document. The space below also works when this page is printed.

Rules and evidence levels

Answer both warmups and classify all three R1 statements. Explain which is a source observation rather than an outcome.

R1 contains every statement and a self-check. Read the definitions first.

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

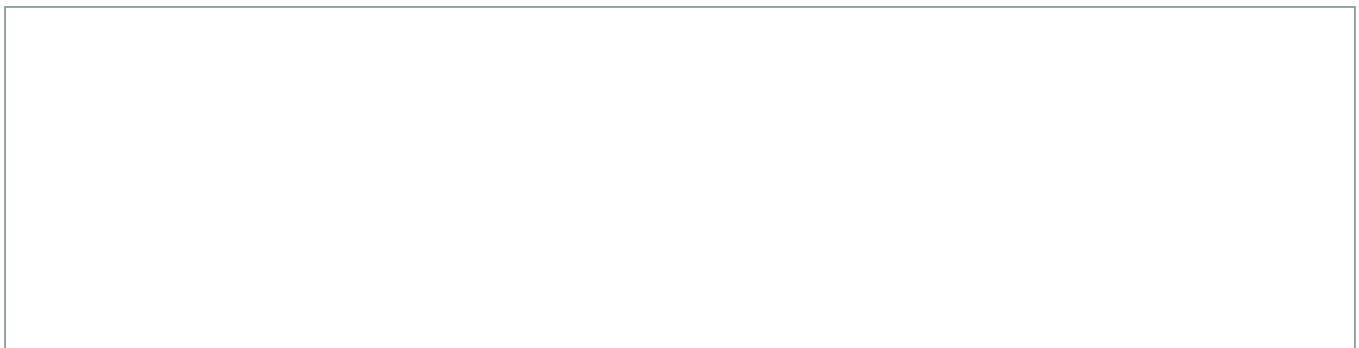


Two innovation questions

Write two distinct questions about evaluating the innovation: one about comparing criteria and one about whose needs or burdens matter.

Use R1 and S1. Leave absent evidence as a question.

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



CER contribution on the top criterion

Choose one leading criterion. Cite at least two evidence IDs, explain why they support the priority and name one limitation.

E1/E2 provide source facts. S1 supplies invented case features; M1 shows a different worked argument.

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

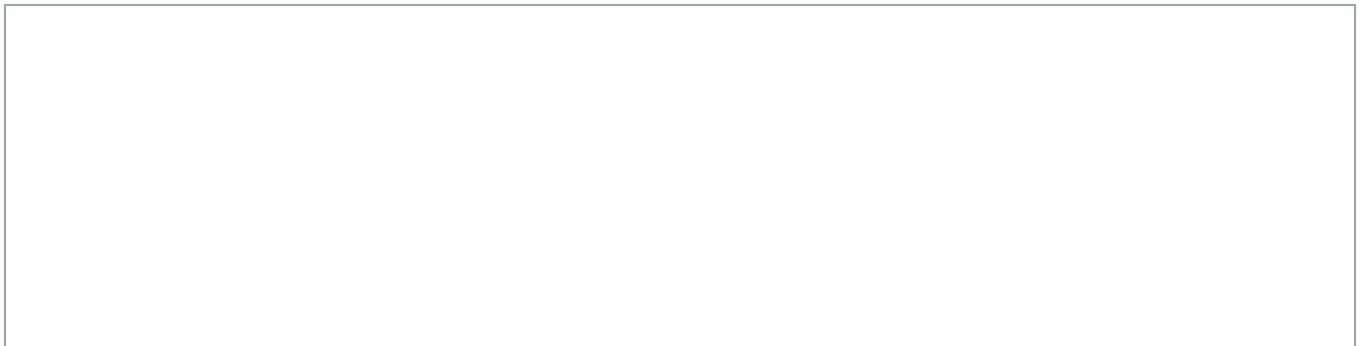


Opposing criterion and reply

Record an actual opposing criterion and your reply, or clearly label C1 as solo practice. Complete the own-post and actual-classmate-reply async branch when available.

C1 supplies different challenges depending on your priority. A solo answer cannot impersonate a classmate reply.

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



Connect the criterion to your proposal

Name your own idea, first-ranked criterion and one design choice it changes. Explain how the counterargument affected you. Add the X1 check and optional A1 extension.

If no idea exists, explicitly adopt S1 as your tentative practice proposal. Ask for any required official idea confirmation.

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

Submit the full record

Keep two questions, one CER contribution and reflection together. Record post, actual reply and missing course inputs separately.

Use the confirmed route. Credit policy and any official activity require teacher confirmation.

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

- I argue for a leading criterion using at least two evidence IDs and a stated limitation.
- I supply two questions, an opposing criterion and a reasoned reply.
- I connect the criterion to my own documented or explicitly adopted tentative idea.
- I distinguish complete original practice from actual posting, reply and official requirements.

Keep the limit: This is original design reasoning, not a tested medical innovation. Source rules and invented features justify a bounded priority, not clinical benefit, approval or a universal ethical ranking. It cannot support conclusions beyond these stated limits.

Turn in your work

Submit two questions, one CER contribution and a reflection through the linked BI assignment. The async branch also requires your post and a reply to one actual classmate. After uploading, check that Schoology shows Submitted.

If access is absent, save the same record and a reply plan. Ask for what you need for actual posting/reply, credit policy and official activity.

[Open this assignment in Schoology.](#)

Carry forward

Name the criterion, support the priority, and state what could change your mind.

Carry your tentative criterion and open questions into the dated March 18 problem-definition task. Your final proposal remains separate. Whose specific need will define the problem your innovation addresses?

Sources and resources

[Open today's page](#)

NGSS-ETS · HS-ETS1-3 Engineering Design

Next Generation Science Standards

<https://www.nextgenscience.org/pe/hs-ets1-3-engineering-design>

FDA-HF · Human Factors and Medical Devices

U.S. Food and Drug Administration

<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/human-factors-and-medical-devices>