

Boyle's law rubric: evidence and reasoning

Share this rubric before the activity begins. The five criteria carry equal weight. Grade the evidence presented, not whether it matches a predetermined conclusion.

Criterion	4 • Complete	3 • Nearly complete	2 • Partial	1 • Beginning
Plan and prediction	Distinguishes volume, pressure and what is held constant; predicts and justifies the relationship before observing.	Reasoned prediction with a minor omission in the variables.	Relevant prediction without justification, or partial confusion of variables.	Lists variables without an interpretable prediction.
Recording and traceability	Legible volume–pressure pairs, with units and trial identified; issues kept and explained.	Identifiable record with a minor omission.	Some of the pairs or their source cannot be checked.	Isolated data with no reliable link to volume.
Data processing	Correct PV products; shows a calculation with units and handles invalid readings explicitly.	One minor calculation or unit error, with a correct method.	Several errors, but the method is recognizable.	Operations with no clear link to the measurements.
Conclusion and limits	Links the claim to at least two rows and to the variation in PV; explains a relevant limitation.	Conclusion supported by data; limitation or comparison underdeveloped.	Describes a trend without justifying it with their values.	Restates the law without using the data.
Reasoned review	Reviews a specific row or decision; distinguishes rereading a recording from an independent trial.	Specific review with an incomplete explanation of what it checks.	Proposes repeating without specifying what or why.	Mentions an error without proposing a useful check.

0 points: no relevant evidence for that criterion. Add up the five criteria: maximum 20 points. If you use a 0–10 scale, divide the total by 2. A documented access issue leaves the experimental part pending; it is not the same as submitting invented data.

Marking and revision

- Record the score for each criterion and one specific action for improvement.
- A shared table can accompany individual conclusions if the collaboration is identified.
- An honestly reported reading issue allows the record to be completed; it does not require inventing a value.
- Do not penalize the same arithmetic error twice if the subsequent argument is consistent with it.
- Do not require identical PV values or a universal tolerance percentage.
- Rereading the same video is not equivalent to an independent trial.

Scores: Plan ____ / 4 · Recording ____ / 4 · Calculation ____ / 4 · Conclusion ____ / 4 · Review ____ / 4. Total ____ / 20.

Action for improvement:

Back to the guide with feedback examples.