Why Good Physics Earns Zero

Twelve rules from the AP Reading that decide whether a correct idea becomes a point.

Students do not run out of physics. They run out of finishing.

The 2025 Chief Reader Report publishes, for the first time, the mean score on *every individual rubric point*. Line all forty up and one pattern runs through the set, clearest in Questions 1 to 3:

AVERAGE ON THE **FIRST** POINT OF EACH QUESTION	**0.75** / 1
AVERAGE ON THE **LAST** POINT OF EACH QUESTION	**0.33** / 1

The lowest-scoring point on the entire 2025 exam was Q1–B2, worth 1 point, earned by **10% of students**. It asked for no calculation. It asked students to say that the friction force added no net external force to the system, because it was *internal* to it.

Nothing in that gap is about knowing less physics. It is about what a response has to *contain* before a reader is allowed to award the point. That is what this issue is: twelve rules, each one quoted from a published College Board scoring document, most of them paired with a real response that lost the point, and each one restated in a single sentence of classroom language.

A note on the green boxes. Each one restates its rule in classroom language, stripped of rubric wording — a formulation, not a script. What to do with it is yours to decide.

Deriving

1 Name the principle before you touch the algebra.

WHAT THE RUBRIC SAYS

"For a multi-step derivation that begins with conservation of energy … 1 point." And, on a different question: "This point may be earned for only stating 'conservation of energy.'"

2024 Scoring Guidelines, Q1(b); 2023 Scoring Guidelines, Q1(a)

WHAT IT COST

A 2024 Q1 response lost the opening point of its derivation for one reason: it *"does not begin with a statement of conservation of energy."* The rubric is not asking for more physics. It is asking to be told which law is about to be used.

IN CLASSROOM LANGUAGE

A derivation starts with a sentence, not a symbol. Write the name of the law first, then the equation. On some questions those five words are a free point.

2 A general equation is not a conservation statement.

WHAT THE READER WROTE

"The first point (A3) was not earned because, although an equation for momentum is provided, the response does

not include an equation that explicitly demonstrates conservation of momentum."
2025 Scoring Commentary, Q1, Sample 1C

WHAT IT COST

The student wrote $p = mv$; the rubric wanted $p_i = p_f$. One is a definition, the other is a claim about the universe. Only the second is scoreable.

IN CLASSROOM LANGUAGE

If your equation has no equals sign between a *before* and an *after*, you have not yet written down a conservation law.

3 The substitution is a separate point from the equation.

WHAT THE RUBRIC SAYS

"The minimum requirement to earn this point is to show an expression … that goes beyond the given equation on the reference information."
2025 Scoring Guidelines, Q1 A5

WHAT IT COST

A 2025 Q1 response substituted the final mass correctly and simply forgot the initial mass: *"Both are necessary to earn this point."* Half a substitution scores the same as none.

IN CLASSROOM LANGUAGE

Copying a formula off the equation sheet earns nothing. The point lives in the line where the problem's own letters go into it.

Drawing

4 Labels have a legal vocabulary. g is not one of them.

WHAT THE RUBRIC SAYS

"Examples of appropriate labels for the gravitational force include F_G, F_g, F_{grav}, W, mg, Mg, 'grav force,' 'F Earth on block' … The labels G or g are not appropriate labels for the gravitational force."
2024 Scoring Guidelines, Q1(c)(i)

WHAT IT COST

A different rubric, 2023 Q3(a)(i), adds the other half of the trap: *"A maximum of 1 point can be earned if extraneous unlabeled arrows are drawn."* A student who hedges by adding one spare arrow caps the whole diagram.

IN CLASSROOM LANGUAGE

Every arrow you draw is a claim you are making. Label all of them, and never label a force with a field.

5 On a sketched graph, shape is the point — accuracy is not.

WHAT THE RUBRIC SAYS

"For drawing a graph that is monotonically increasing … 1 point. For drawing a concave down curve … 1 point." *And elsewhere: "The correct slope is not required to earn this point."*
2024 Scoring Guidelines, Q3(e) and Q5(b)

WHAT IT COST

2025 Q2 splits one sketch into three points: the total-energy line (horizontal, continuous, labelled), the U_g line (straight, decreasing, labelled), and where U_g starts. One response was marked down on the third for beginning U_g at $(8D,\ 13E_0)$ instead of $(8D,\ 4E_0)$.

IN CLASSROOM LANGUAGE

Sketch questions are graded on four things: does it go up or down, does it curve which way, where does it start, and is it labelled. Get those and the wobble does not matter.

6 On a plotted graph, the mechanics are the points.

WHAT THE RUBRIC SAYS

"For labeling the vertical axis (including units) with a linear scale." *And, separately: "For plotting at least 4 of*

the data points correctly … For drawing a best-fit line that approximates the trend of the data."

2025 Scoring Guidelines, Q3 C(ii); 2023 Scoring Guidelines, Q2(a)(ii)

WHAT IT COST

A 2025 Q3 response lost a point purely because *"the vertical axis label does not include units."* A 2023 Q2 response lost three in a row: nonlinear scaling with one axis unscaled, fewer than four points plotted, no trend line.

IN CLASSROOM LANGUAGE

Before you plot anything: units on both labels, even spacing, four points minimum, one straight line through the middle. That is four points before you have thought about physics.

Arguing

7 State the claim outright. The claim itself is a point.

WHAT THE RUBRIC SAYS

"For indicating 'Remains constant.'" That is the whole requirement for Point B1.

2025 Scoring Guidelines, Q1 B

WHAT IT COST

Only 36% of 2025 students earned that point — for ticking the correct box. And the claim does not travel alone: in both mid- and low-scoring samples, the response that got B1 wrong went on to lose B2 and B3 as well. Once the verdict is wrong or missing, the reasoning built on it has nothing to attach to.

IN CLASSROOM LANGUAGE

Answer the question in the first sentence, in words, before you explain anything. An explanation with no conclusion attached is unscoreable.

8 Name what stays the same, not only what changes.

WHAT THE READER WROTE

"The second point (A2) was not earned because the response does not state that the force of gravity is the same in both scenarios, which is necessary to compare the net forces."

2025 Scoring Commentary, Q4, Sample 4C

WHAT IT COST

2024 Q4 repeats it: the response *"does not indicate the sphere travels the same vertical distance in both scenarios …"* (Sample 4B). Students name the variable that moved and treat the rest as too obvious to write down. A reader cannot award a comparison whose fixed terms are unstated.

IN CLASSROOM LANGUAGE

A comparison needs two halves: this changed, *and* that did not. The second half is where the point is, and it is the half you will want to skip.

9 Attempting the functional dependence scores. Getting it right is a bonus.

WHAT THE RUBRIC SAYS

"It is not necessary to use the functional dependence correctly to earn this point."

2023 Scoring Guidelines, Q3(c); repeated verbatim in 2025, Q4 C1

WHAT IT COST

2024 Q3 shows the failure mode: the point was lost because the response *"does not attempt to use functional dependence to relate the derivation in part (c) to the reasoning used in part (b)."* Not wrong — absent. A shaky attempt outscores a blank.

IN CLASSROOM LANGUAGE

On a QQT, always write the sentence "in my equation from part (b), when ___ increases, ___ ___, which is why ___." Even a shaky version of that sentence is worth a point. A blank never is.

Lab work, and the endgame

10 "Human error" is worth exactly zero.

WHAT THE RUBRIC SAYS

"A statement of 'Human error' does not earn this point."

2023 Scoring Guidelines, Q2(c)(i)

WHAT IT COST

The rubric prints what *does* pay, and it is unglamorous: a physical factor in the equipment ("the wheels have nonnegligible rotational inertia," "the base of the ramp was not level"), in the environment, or in measurement ("time, position, or angle was measured incorrectly").

IN CLASSROOM LANGUAGE

"Human error" names nothing. What scores is one specific thing — in the apparatus, the environment, or the measurement — and the direction it pushed the reading: too high or too low.

11 A calculated slope is almost never the answer.

WHAT THE RUBRIC SAYS

"For using the slope in a valid kinematic equation to calculate the acceleration … 1 point."

2023 Scoring Guidelines, Q2(a)(iii)

WHAT IT COST

All three published 2023 Q2 samples lost this point with the same words: *"the response does not use the slope in a valid kinematic equation to calculate the acceleration."* Two of them had computed the slope correctly. The Chief Reader said it plainly: *"many responses calculated a slope, yet that slope was not the final answer."*

IN CLASSROOM LANGUAGE

Finding the slope is the middle of the problem, not the end. Ask yourself what the slope *is* — in symbols — and then solve for what was asked.

12 A right answer with no work caps your score.

WHAT THE RUBRIC SAYS

"A correct answer of $K_f = \frac{3}{2}MgL$ with no supporting work can earn only this point." The following year, in almost the same words: *"A correct response with no supporting work earns this point only."*

2023 Scoring Guidelines, Q5(b)(i); 2024 Scoring Guidelines, Q2(c)(i)

WHAT IT COST

A student who sees the answer and writes it down forfeits the principle point and the substitution point that sat in front of it. In 2023 Q5(b)(i) that is two of three points, gone, for being fast.

IN CLASSROOM LANGUAGE

On the free response, speed is not rewarded and confidence is not rewarded. Show the line you skipped. It is worth more than the answer it leads to.

Where this shows up first

On a free response that has already been written and already been graded, the gap is visible without any new teaching: **the places where the physics was known and not written down.** Rules 1, 7 and 8 account for most of what turns up there.

And one thing worth knowing

The rubrics are quietly generous about one thing: points downstream of a mistake are routinely awarded *"consistent with"* the student's own earlier answer. 2025 Q1 A7 pays for a final velocity consistent with part A(ii), right or wrong; 2024 Q1 pays for heights consistent with the student's own bar chart. A wrong part (a) does not cost part (b) — unless the response stops there.

Sources. All quotations are from College Board documents published on AP Central: the AP Physics 1 Scoring Guidelines, Scoring Commentary and Chief Reader Reports, 2023–2025. Point-level means are from the 2025 Chief Reader Report ($N = 174{,}992$).