

# One More Take

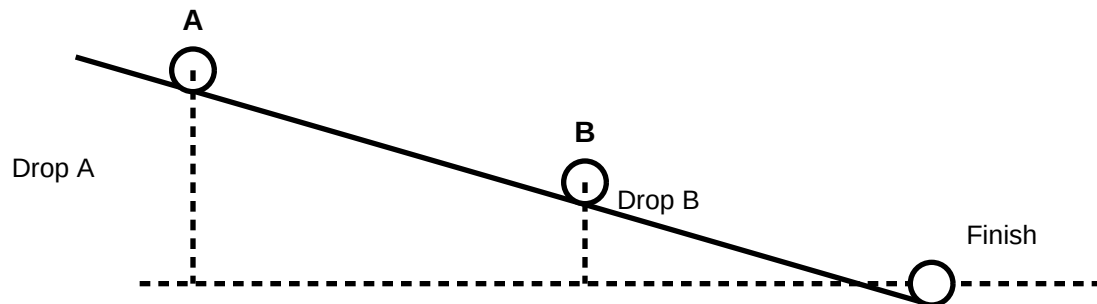
## A useful model is not a guarantee

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Goal: justify what an endpoint-energy comparison can establish, audit an inference, and plan a comparison under changed practical constraints. No numerical formulas, equipment or online access are needed. The story brief and vocabulary are sufficient.

Quinn wants to film a marble run that ends with the marble staying in a cup. He adds a detour between the same start and finish, but the marble still jumps out. He then compares a higher and a lower release point on the same track. In the story, the lower release stays in the cup. Later, he moves the cup to a lower shelf to make room for the camera, reconsiders the release point and tests the changed arrangement. These story events are not a measured experimental dataset.

A ramp is a sloping surface. Vertical drop is the straight-down difference in height between the marble center at release and at the finish; it is not the track length. Stored gravitational energy belongs to the marble-Earth system because of their relative position. Movement energy includes the marble travelling and spinning. An ideal model is a simplified comparison: here, use the same marble, release it from rest without a shove, assume rolling without slipping, and set energy losses aside. Real tracks need their own checks.



Alternative releases on one downhill track: A is higher than B; both use the same marble and the same finish. Dashed vertical markers run from each release-center height to the finish-center level. The A marker is longer. They show vertical drop, not force or route length. Sketch only; not to scale.

**HS01 Build a claim-evidence-limit response: compare A and B in the ideal model. State a speed claim, explain the energy reasoning, identify the controlled conditions, then state one conclusion about cup retention that does not follow.**

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# One More Take

**Audit a claim, then change the destination**

**HS02 Audit this claim: "A longer route must make the same marble slower at the finish." Give a bounded ideal-model response and a separate real-track response. State why those responses need not conflict.**

**HS03 A filming display must now finish in a tray higher than the old cup. Design a paper layout that preserves the old vertical drop. Sketch the endpoints and drop markers. Explain your release adjustment, then distinguish the ideal speed comparison from a prediction of whether the marble stays in the tray.**

# One More Take

## Plan observations and separate the questions

**HS04 Plan, but do not perform, a comparison of high and low release marks. Specify the changed factor, two controlled conditions, an observable response, repeated trials and how you would record exceptions. Explain why a consistent catch result still would not establish a universal rule or directly measure finish speed.**

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**HS05 Two routes have the same endpoints. A learner predicts both the same ideal finish speed and the same travel time. Evaluate these as two separate claims. What extra observation would address the time claim, and what release/finish boundaries should it use? Do not rank unknown routes.**

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Takeaway challenge: state one supported conclusion and one open question from your answers. Optional next reading: One More Take, especially its final timing question. The source links below are optional; no sign-in is needed. Answers are in the separate teacher key.

### Optional source reading

One More Take - source story | <https://thisworldexplained.com/okay-but/one-more-take/>

OpenStax: gravitational energy and endpoint heights | <https://openstax.org/books/college-physics/pages/7-3-gravitational-potential-energy>

OpenStax: energy in ideal rolling | <https://openstax.org/books/university-physics-volume-1/pages/11-1-rolling-motion>

# One More Take

## Optional reusable concept lessons

Choose a refresher or extension only if it helps your question. These published lessons are extra reading, not required steps. The vocabulary, diagram and prompts in this worksheet already work offline; use those pages when links are unavailable.

### Height into Motion

Optional refresher: revisit the relationship between a release height and the energy available from its drop.

<https://thisworldexplained.com/okay-but/height-into-motion/>

### Vertical Drop versus Distance

Optional refresher for the changed-finish sketch: keep straight-down endpoint separation distinct from the distance along the route when a finish moves.

<https://thisworldexplained.com/okay-but/vertical-drop-versus-distance/>

### Fair, Repeated Trials

Optional extension for comparison planning: explore recording all trials and discussing variation without treating one catch as proof.

<https://thisworldexplained.com/okay-but/fair-repeated-trials/>

### Finish Speed versus Arrival Time

Optional extension for the final timing question: separate speed at the finish from elapsed time across the journey.

<https://thisworldexplained.com/okay-but/finish-speed-versus-arrival-time/>

Return to the source story: One More Take. Its lower-shelf application and final timing question give these concepts a practical setting.

### One More Take

Optional return to Quinn's complete story; your worksheet remains usable without opening it.

<https://thisworldexplained.com/okay-but/one-more-take/>