

One More Take

The camera needs an ending

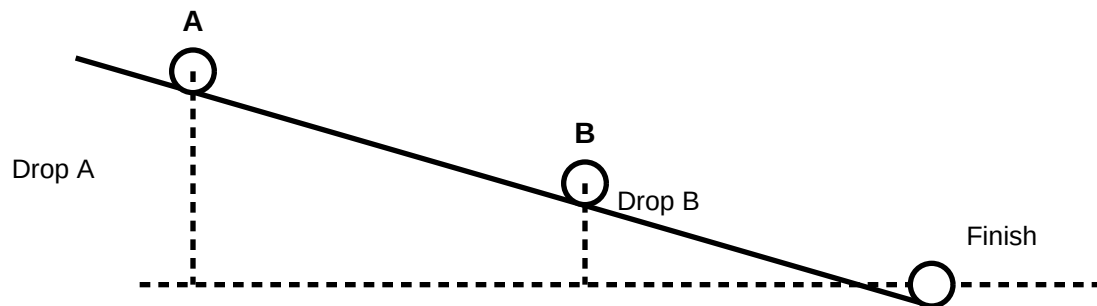
Name: _____ Date: _____

Goal: explain a release-height comparison and use it when a finish moves. Read the brief below; the full story is optional. Work on paper or explain aloud while someone records your ideas. No marble run or internet is required.

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.

MS01 Quinn first adds track between unchanged start and finish heights. What did he change? Name two things that stayed the same. Use the story brief.



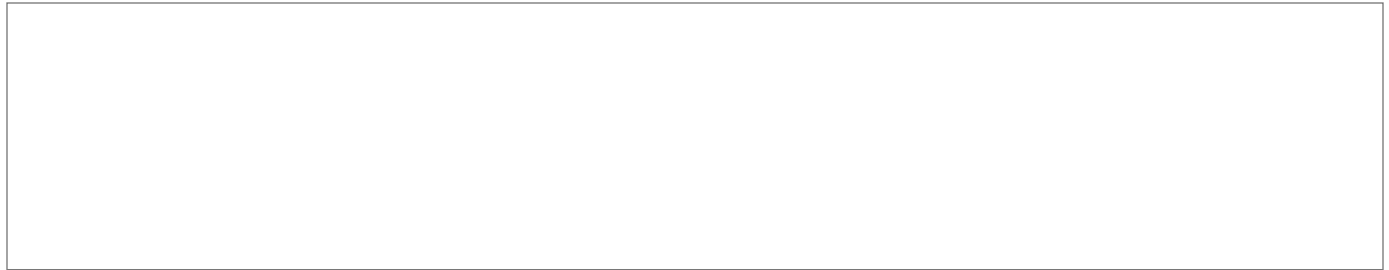
Alternative releases on one downhill track: A is higher than B; both use the same marble and the same finish. Dashed vertical markers run from each release-center height to the finish-center level. The A marker is longer. They show vertical drop, not force or route length. Sketch only; not to scale.

MS02 Before checking an answer, predict which release, A or B, gives the same marble less ideal finish speed. Explain using the vertical drop. Your reasoning matters more than the letter.

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Move the finish, rethink the start

MS03 Sketch two arrangements: first a release above a desk finish, then a finish on a lower shelf. Place a new release so its vertical separation from the new finish matches the first. Label both releases and finishes; draw vertical drop markers, not force arrows.



MS04 A classmate says, "The lower release caught the marble, so the ideal model guarantees every cup catch." Explain why this conclusion goes too far. Use one real-track detail that should be checked.

MS05 Different use: a display tray replaces the cup, at a higher finish level. On paper, where should the release move to preserve the old vertical drop? Explain and name something about the actual tray run that still needs testing. Do not build it.

MS06 Exit takeaway: complete the thought in your own words. "When the finish moves, I compare _____ with _____ because _____. The model cannot tell me _____."

Optional rabbit hole: revisit One More Take and its optional depth. Ask whether the new route takes the same time; do not decide from finish speed alone. Source notes are below. 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/>

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

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

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