

# A small part, competing explanations

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

Your goal: construct a consistent mechanism explanation, distinguish observation from model-based inference, and defend a bounded practical choice. Relative motion means movement compared with a chosen part. Tape carries elements; the pull tab attaches to the slider body. Force is a push or pull; sliding friction opposes relative sliding at contact. No numerical force, coefficient or earlier lesson is required.

Evidence from the paired story: a joined chain remains behind a moving slider. An early stall includes lining inside the passage. A later stall has a clear-looking passage and widely spread, loaded edges. These authored situations illustrate questions; they are not force measurements.

**HS01 | Before turning the page, compare two hypotheses: H1, the slider continuously clamps the whole closed seam; H2, it guides local engagement that stays after it passes. Which observation challenges H1? Sketch a possible route for H2 and predict what reversing relative motion would do. State a remaining uncertainty.**

**HS02 | What would you need to explain in addition to joining the rows to account for the long section left behind? Give a causal question, not just a part name.**

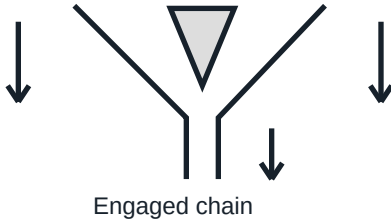
# Keep the viewpoint consistent

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

Reference model: a Y-shaped passage guides joining and separation. In this particular metal design, elements from opposing rows alternate; projections nest in adjacent recesses with compatible close fit. This geometry retains engagement, rather than the slider occupying every joined point. Exact shapes vary across constructions.

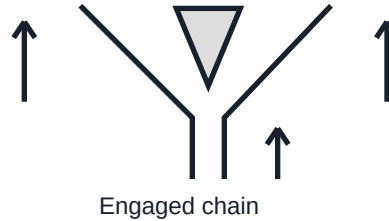
## Closing - slider held fixed

Separate rows



## Opening - slider held fixed

Separate rows



Two branches meet one route in a schematic slider held fixed. Closing: separate rows travel through the branches toward the joined route. Opening: the engaged chain travels the reverse way and divides at the branches. These arrows describe elements relative to a fixed slider, not the slider moving along a bag. Hidden interior is a model, not to scale.

**HS03 | Closing in this drawing sends elements toward the single route, with the slider fixed.**

**Describe the equivalent closing operation on a bag whose tapes are held still. In a sketch, name the fixed part and the moving part for each viewpoint. Why would copying the same arrow label "slider travel" onto this diagram be misleading?**

**HS04 | An opaque, intact zipper shows joining and separation during normal movement. Does that observation directly verify the hidden Y passage or exact projection-and-recess geometry? Separate an observation, a model-based explanation and a claim requiring other evidence.**

**HS05 | A coil zipper does not have the described metal-model hollows. Which general explanation can still be used, and which exact-shape conclusion must be withheld? Explain why this is a scope boundary rather than proof that all zipper explanations are wrong.**

## Reason under changed conditions

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

The following are hypothetical reasoning tasks. Do not induce jams, overload bags or test breaking points. Some sliders also have locks that restrict slider travel; lock types differ. A slider lock and a joined chain are different explanatory jobs.

**HS06 | Evaluate: "All slider resistance is friction, so a stronger pull is always the right response." Use both the lining and loaded-edge cases to test this claim. Explain what sliding friction means, two other relevant conditions, and why a numerical safe pull cannot be calculated from these cases.**

---

---

---

**HS07 | A zippered organizer will not close normally. Thick cards spread its sides; a loose flap lies near the route, but you cannot tell whether it is caught. Propose an order of observation and condition changes, justify each, and state a stopping rule. Explain why this plan is conditional rather than a guaranteed diagnosis or repair.**

---

---

---

**HS08 | Design a fair, gentle comparison of opening and closing using an intact empty case, or use the paper model if no suitable case is available. Name the changed condition, three fixed conditions, what you would record, the safety boundary, and two claims this comparison cannot establish. Finish with one mechanism takeaway you would use in another situation.**

---

---

---

---

Source notes: YKK explains the passage/parts and handling; Sundback's original design supplies the bounded metal fit. Coats' invisible-zip brochure supports type-specific clearance; NASA supplies force/friction foundations, not zipper tests. Full descriptive source links are in the paired story. Optional next reading: Force asks what a pull is being asked to do. It can extend the packing-choice question, but this worksheet needs no online lesson. Story: <https://thisworldexplained.com/okay-but/the-bag-that-wouldnt-take-one-more-thing/> Force: <https://thisworldexplained.com/okay-but/force-what-are-you-asking-the-pull-to-do/>