

A direction arrow is not a diagnosis

High school worksheet | OBML-007 | Free classroom and home copy

Name: _____ Date: _____

Goal: distinguish a force representation, observed conditions and supported action. Evaluate what evidence can and cannot establish. Prerequisites: a force is a push or pull; direction describes where it acts. No equations or physical trial are needed.

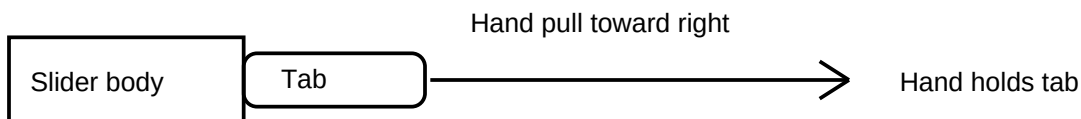
Before deciding

A supply pouch resists closing. Someone suggests doubling the arrow drawn beside the pull tab. Before reading further, what evidence would you need to judge that proposal?

HS01 | Write a provisional claim and two observations you would seek. Do not invent measurements.

Read the evidence cards

A - Representation: this diagram labels a hand's pull toward the right. It supplies no measured force size, speed or outcome.



Direction only: no scale, measured size or guaranteed movement.

Text equivalent: hand pull acts on the slider through its attached tab, toward the right. Arrow length has no numerical meaning in this drawing.

B - Mechanism: YKK describes the slider's Y-shaped passage guiding rows into engagement and apart. The drawing above is a force-direction diagram, not a cutaway of that passage.

C - Conditions: YKK's use precautions distinguish cloth caught in the slider from an overfilled bag. For the overfilled bag, reduce contents and bring chain sides close before closing. Avoid force. Stop at failed gentle normal movement or apparent damage.

HS02 | Separate three claims: direction of hand pull; size of that pull; reason this particular pouch resists. Which can card A establish? Which need other evidence, and why?

Compare, qualify, transfer

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HS03 | Two hypothetical cases: P has a cloth fold entering the passage; Q has a clear visible passage but wide, loaded opening edges. Identify the changed condition, two shared features and a supported choice for Q. Explain why this is not a universal diagnosis or guarantee.

HS04 | Design a paper-only comparison of Q before and after reducing contents. Label the changes and intended constants. State a prediction cautiously, then identify what your sketch cannot measure or demonstrate.

Transfer without guessing a mechanism

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HS05 | Transfer: a hand pulls a drawer handle toward the reader, but no movement is observed.
Critique "The arrow points outward, so the drawer must open." Give one claim you can make from the stated pull and two questions left unanswered. Do not prescribe a repair or forceful test.

Takeaway: revise your HS01 proposal using the evidence. Write one sentence that separates direction from diagnosis.

Optional connected reading

Force supplies a reusable way to describe the hand's action. The zipper story shows why changing packing conditions matters. The story's successful closure is an authored outcome, not a measured force trial.

Force micro-lesson: <https://thisworldexplained.com/okay-but/force-what-are-you-asking-the-pull-to-do/>

Zipper story: <https://thisworldexplained.com/okay-but/the-bag-that-wouldnt-take-one-more-thing/>

NASA, Toys in Space II, glossary p. 20: force means push or pull.

YKK, zipper structure: the slider guides joining and separation.

YKK, use precautions: different conditions need different choices; avoid forcing.