

Question #53

A long thin rod is held vertically on an air table. An air puck provides for sliding without friction of the bottom end of the rod when the rod is released. A small weight equal to the weight of the air puck attached to the top end of the rod makes the rod symmetric, equivalent to a thin uniform rod.



The question involves what the rod does when the top end is released and it is allowed to topple. In particular, will it topple like a falling chimney, so that the bottom end of the rod remains at the same point? Or will the bottom end begin to slide when it is released - after all, the bottom end slides without friction on the air table - so that the top end will fall straight down to the point where the bottom end was when it was released? Or perhaps the center of mass will move straight downward. What is the important physics concept that governs how the rod will topple?

When the rod is released, it will fall with

- (a) the bottom end remaining at the same point.
- (b) the top end moving straight down.
- (c) the center of mass moving straight down.

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[Question of the Week](#)

[Outreach Index Page](#)

[Lecture-Demonstration Home Page](#)



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