

NEXT-TIME QUESTION

Little Larry slides down an icy grass slope in a cardboard box and skids to a stop across the flat ground. If Larry's friend were also in the box, giving it twice the mass and starting from the same height, the skidding distance would be



- a) less.
- b) the same.
- c) twice as far.
- d) four times as far.
- e) none of the above.



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Answer: b

Twice the mass means twice the normal force and, hence, twice the friction—both on the slope and on the level ground. So on the slope, with both gravity and friction proportional to mass, acceleration is the same and the speed at the bottom is the same. Starting with the same speed across the flat ground, with frictional force proportional to mass, deceleration and stopping distance is the same.

With both boys aboard, the normal force is everywhere doubled — so friction is everywhere doubled.



Twice the *speed* at the bottom of the slope, however, would produce four times the stopping distance.



Hewitt
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