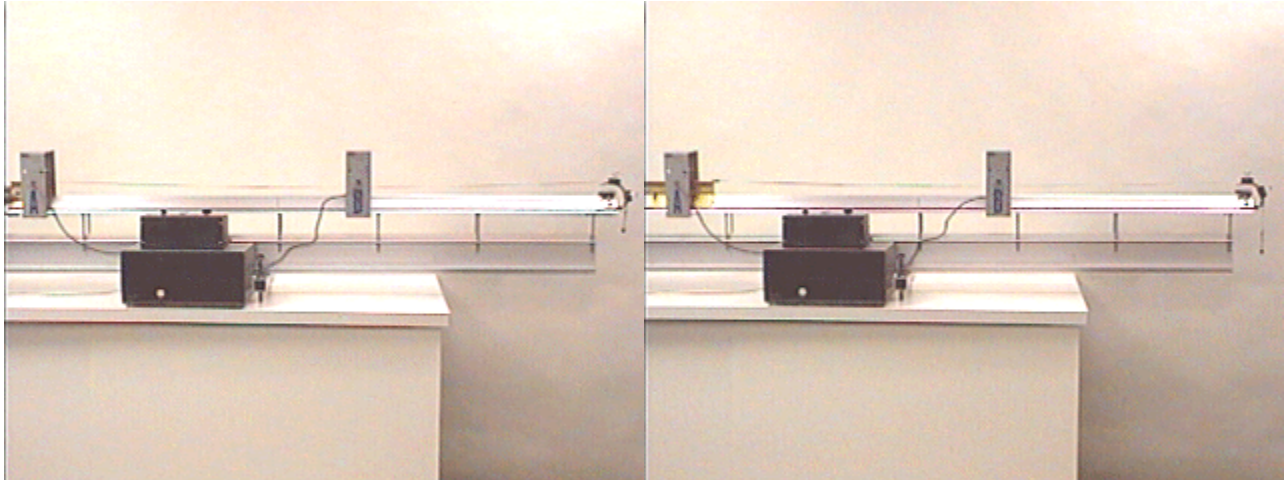


## Question #119

A mass  $M$ , that we will call the "cart mass," on a level air track, is connected by a piece of audiotape passing over a nearly frictionless air pulley pulley to a *much* smaller mass  $m \ll M$ , that we will call the "accelerating mass," as seen in the photograph at the left below.



Releasing  $M$  allows  $m$  to accelerate it along the air track. The timer measures the time taken for a flag on the top of the air track glider to travel from photocell gate "A" to gate "B," which turns out to be exactly 2.00 seconds. See a video of the action by clicking your mouse on the photograph at the left above.

Now suppose that the same experiment is performed with cart mass  $M$  being increased to  $2M$ , as seen in the photograph at the right above. How long will the glider take to travel the distance  $D$  from photocell gate "A" to gate "B"?

The time taken for mass  $m$  to accelerate mass  $2M$  a distance of  $D$  from A to B will be:

- (a) 4 seconds.
- (b) 2.83 seconds
- (c) 2 seconds (the same).
- (d) 1.41 seconds.
- (e) 1 second.

Click here for [Answer #119](#) after September 9, 2002.

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For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).