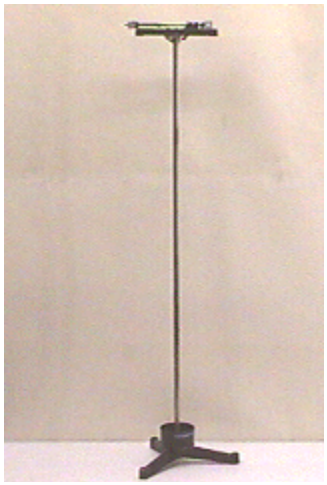
Answer #47

The answer is (c): the two balls will get to the floor simultaneously, as can be seen in an mpeg video by clicking your mouse on the photograph below.



The dropped ball falls to the ground, a distance of x, in a time t determined by the equation for motion in one dimension with constant acceleration, the acceleration of gravity g:

$$x = (1/2)\, g\, t^{**}2$$

The projected ball starts with a horizontal velocity, but **no** vertical velocity, so its vertical component of motion is exactly the same as that of the dropped ball. This property of motion is referred to as "separation of components."

Use your mouse to move the video frame-by-frame so that you can see in more detail how the balls fall with the same vertical position at all times.

Note the use of the "square ball," invented by Bill Norwood of the University of Maryland, so that when the balls land on the floor they will not roll away and become lost.

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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.