Answer on Question #62143, Physics / Mechanics | Relativity

On the Apollo 15 space mission, Commander David R. Scott verified Galileo's assertion that objects of different masses accelerate at the same rate. He did so on the Moon, where the acceleration due to gravity is 1.62 m/s² and there is no air resistance, by dropping a hammer and a feather at the same time. Assume they were 1.25 meters above the surface of the Moon when he released them. How long did they take to land?

Solution:

The kinetic equation is

$$h = v_o t + \frac{1}{2} a t^2$$

where
$h = 1.25\ m$ is initial position
$a = 1.62\ m/s^2$ is acceleration
$v_0 = 0\ m/s$ is initial speed
Thus,

$$h = \frac{1}{2} a t^2$$

The time of fall is

$$t = \sqrt{\frac{2h}{a}}$$

$$t = \sqrt{\frac{2 \cdot 1.25}{1.62}} = 1.24\ s$$

Answer: $1.24\ s$