Flipping Physics Lecture Notes:
Dropping a Ball from 2.0 Meters
An Introductory Free-Fall Acceleration Problem

Example Problem: Mr.p drops a medicine ball from a height of 2.0 m above the ground. (a) What is the velocity of the ball right before it strikes the ground? (b) How long did the ball fall?

Knowns: $\Delta y = -2.0$ m, $a_y = -9.8$ m/s^2, $v_{iy} = 0$, $v_{fy} = ?$, $\Delta t = ?$

Common mistake: The final velocity of the medicine ball is not zero. *After* the ball strikes the ground it's final velocity is zero, however, it isn't in free-fall anymore the moment it touches the ground.

Common mistake: Forgetting that the displacement is negative. It is negative because the ball is going down and down is negative. Or you could look at it this way: $\Delta y = y_f - y_i = 0 - 2 = -2.0m$

We know we can use the UAM equations because the acceleration is constant.

$$v_{fy}{}^2 = v_{iy}{}^2 + 2a_y\Delta y = 0^2 + (2)(-9.81)(-2) \Rightarrow v_{fy} = \sqrt{(2)(-9.81)(-2)} = \pm 6.26418 \approx \boxed{-6.3\frac{m}{s}}$$

An equivalent answer would be 6.3 m/s down. However, please do not get overzealous and write -6.3 m/s down because, -6.3 m/s down = 6.3 m/s up, which is wrong.

Common mistake: Many of you will get $v_{fy} = +6.26418$ m/s because that is what your calculator says. Please be smarter than your calculator and remember, whenever you take the square root, that the answer could be positive or negative.

$$v_{fy} = v_{iy} + a_y\Delta t \Rightarrow -6.26418 = 0 + (-9.81)\Delta t \Rightarrow \Delta t = \frac{-6.26418}{-9.81} = 0.638551 \approx 0.64\,\text{sec}$$

Possibly useful definitions:
Parallax (noun): the effect whereby the position or direction of an object appears to differ when viewed from different positions, e.g., through the viewfinder and the lens of a camera.
Eschew (verb): deliberately avoid using; abstain from.
Perspicacious (adjective): having or showing an ability to notice and understand things that are difficult or not obvious.
Overzealous (adjective): too zealous in attitude or behavior.
Zealous (adjective): having or showing zeal.
Zeal (noun): great energy or enthusiasm in pursuit of a cause or an objective.