



Flipping Physics Lecture Notes:  
Introduction to Uniformly Accelerated Motion  
with Examples of Objects in UAM

<https://www.flippingphysics.com/introduction-to-uniformly-accelerated-motion.html>

Uniformly Accelerated Motion (UAM) is motion of an object where the acceleration is constant. In other words, the acceleration remains uniform; the acceleration is equal to a number and that number does not change as a function of time.

Examples of objects in UAM:

- A ball rolling down an incline.
- A person falling from a plane.
- A bicycle on which you have applied the brakes.
- A ball dropped from the top of a ladder.
- A toy baby bottle released from the bottom of a bathtub.

(Technically, because of friction and a non-constant gravitational field, etc., they are not quite Uniformly Accelerated Motion, however, at this point we will treat them as if they are, because it is close enough, *for now.*)

These are the equations that describe an object in Uniformly Accelerated Motion:

$$\begin{aligned}v_f &= v_i + a\Delta t \\ \Delta x &= v_i\Delta t + \frac{1}{2}a\Delta t^2 \\ v_f^2 &= v_i^2 + 2a\Delta x \\ \Delta x &= \frac{1}{2}(v_i + v_f)\Delta t\end{aligned}$$

There are 5 variables in the UAM equations:

$v_i$  = *velocity initial*

$v_f$  = *velocity final*

$a$  = *acceleration*

$\Delta x$  = *displacement*

$\Delta t$  = *change in time*

My Suggestion. When you use the UAM equations, you should use base SI dimensions; meters and seconds.

Here is how it works:

There are FIVE variables in the UAM equations.

There are FOUR UAM equations.

If you know THREE of the variables,  
you can determine the other TWO variables.

This leaves you with ONE happy physics student.

(note: not one answer. There can be more than one answer.)

More about UAM: <http://www.flippingphysics.com/algebra.html#1d>

A helpful definition:

peanut gallery (noun): a group of people who criticize someone, often by focusing on insignificant details.