An easy way to Physics: 03 Mass, Velocity, and Acceleration

Mass
If we could transport a sack of rice (10 kg) to the moon, it would weigh there 1/6 of its weight here on earth, only. The number of the grains of rice wouldn't change at all. We call the quantity, that is independent of the place as mass. The mass is measured in 1 kg [kilogram].

Velocity
The velocity says, how fast a thing is. When I go from Wang Pho to Bong Ti, I have to go 25 km. If I can go this way in 30 minutes, then the average velocity $\bar{v}$ is the way s divided by the time t
$\bar{v} = s / t = 25 \text{ km} / 30 \text{ min} = 50 \text{ km} / 60 \text{ min} = 50 \text{ km/h}$.

If the velocity v is constant, the distance s covered during the time t is $s = v \cdot t$. Often the velocity is not always the same, sometimes smaller, sometimes higher. Then we have to calculate the velocity for a very small distance and a very small time, for example. 10 m/s.

Sum of Velocities
If you sit in a bus, you don't move in the bus, but you move with the bus. If the bus goes with 20 m/s and you stay on your seat, you also move with 20 m/s. But if you leave your seat and walk with 0,5 m/s in the bus to the front door, you move with 20,5 m/s. But if you walk with 0,5 m/s to the back door, you move with 19,5 m/s.

Acceleration
If we take a body, lift it up and let it go, then the body begins to fall down and its velocity increases more and more. Its velocity increases per second by approximately 10 m/s. It starts with 0 m/s, has 10 m/s after 1 s, 20 m/s after 2 s and 50 m/s after 5 s. The increase of the velocity per second is called acceleration and is measured in 1 m/s^2. If a car slows down, it is called in physics a negative acceleration.

If you have a constant acceleration, the velocity is $v = a \cdot t$. The average velocity during this time is $\bar{v} = 1/2 \cdot a \cdot t$. The distance covered until the time t is then $s = \bar{v} \cdot t = 1/2 \cdot a \cdot t \cdot t = 1/2 \cdot a \cdot t^2$.
For a falling body, the acceleration is called g. In Thailand $g = 9{,}78 \text{ m/s}^2 \approx 10 \text{ m/s}^2$