

# University Physics 1A

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## Dynamics

Kinematics is the study of how things move, while dynamics is the study of why things move.

### Newton's 3 Laws

1. The natural state of motion of an object is to move with constant velocity (which could be zero), and a force is needed to change that.
2. The net force on an object is the mass of that object times the acceleration of that object.

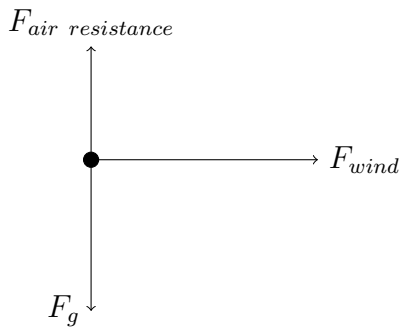
$$\vec{F}_{net} = m\vec{a}$$

3.  $F_{A \text{ on } B} = -F_{B \text{ on } A}$

Think of a force as a push or pull:

force	on	caused by
gravity	book	mass of Earth
normal ( $\perp$ )	book	table
friction	book	table
buoyancy	rubber ducky	water
tension	on part of string	neighboring part of string
electrical	charge	another charge
spring	on object at end	spring

We draw free body diagrams from a single dot. Example:



## Reminders and Homework

Complete the homework on TheExpertTA and WebAssign.

**Remember to bring the Activities Manual**

You can find all my notes at <http://omgimanerd.tech/notes>. If you have any questions, comments, or concerns, please contact me at [alvin@omgimanerd.tech](mailto:alvin@omgimanerd.tech)