

READING ASSIGNMENT FOR SEPTEMBER 13

SECTIONS 4.1 THROUGH 4.3

Please notice that this file is two pages long.

4.1 - Motion and Forces

- Chapter 4 begins our study of Dynamics - The cause of motion.
- Read the section about Aristotle carefully - most people today still hold an Aristotelian view on motion.
- I think it's a little premature to introduce Newton's First Law of Motion so quickly, but there it is. Skim this for now; we'll go through it again in more detail later.
- The importance of force cannot be overstated! Read this carefully.
- A force is a a push or pull that acts on an object. It is a vector with magnitude and direction.
- A force requires an agent - something that does the pushing or pulling.
- Contact vs. Long-range forces - Our only example of a long-range force this term will be gravity. The rest will be contact forces.
- Force Vectors - Always drawn starting from the object that is being pushed or pulled.
- We find the *Net Force* by doing vector addition. To stress the fact that we have to do vector addition, I will use the symbol $\Sigma \vec{\mathbf{F}}$ instead of $\vec{\mathbf{F}}_{net}$ for net force.

4.2 - A Short Catalog of Forces

- One of your main tasks in this chapter and for the rest of the class will be to identify the type and direction of forces!
- Weight - downward force due to gravity. There is a difference between mass and weight.
- Tension - the pulling force exerted by a string, rope, or spring. (I tend to think of the spring force as a tension). Tension is always at the same angle as the rope itself.

- Normal Force - force exerted by one solid object on another solid object. Always at 90° to the surface.
- Friction - force that slows a moving object down (technically called Kinetic Friction) or prevents a stationary object from starting motion (Static Friction). Kinetic friction is always opposite to the velocity vector.
- Drag and Thrust - I probably won't go into as much detail as the book does here, but you should know and be able to identify them.

4.3 - Identifying Forces

- Read the Tactics Box 4.2. It contains good tips on how to ID forces.