

Chapter 5: Newton's Second Law

Text:Chapter 5

Think and Explain: 1-5

Think and Solve: 1-6

Vocabulary:

net force, inversely proportional, Newton's 2nd law, normal force, mass, weight, friction, tension, system, pulley

Equations:

$$F_{net} = ma \quad F_{net} = \Sigma F \quad F_g = mg \quad F_x = F \cos \theta \quad F_y = F \sin \theta$$

Constants: $g = \pm 10 \text{ m/s}^2$ $1 \text{ kg} = 1000 \text{ grams}$

Key Objectives:*Concepts*

- Explain and apply Newton's Second Law of Motion.
- Understand the affect of applied force, friction, and net force on an object's acceleration.
- Sketch free body diagrams for objects undergoing horizontal acceleration.
- Sketch free body diagrams for objects undergoing vertical acceleration.
- Understand the cart/pulley/mass system. (Newton's Second Law Lab)
- Define friction and describe what it does.

Problem Solving

- Use constant acceleration equations to solve for the acceleration of an object.
- Find the net force acting on an object given all of the individual forces.
- Use Newton's 2nd Law to solve for the unknown value.
- Solve cart/pulley/mass problems.