

Mr. Jenkins
Physics I

Assignment Sheet
Newton's Laws of Motion
Dynamics and Static Equilibrium Part 1

Objectives

You will be able to:

- A. state Newton's first law and give several examples to illustrate it.
apply Newton's second law to a free body diagram with unbalanced forces to find an acceleration.
state Newton's second law in words and equation form. Explain why it is important to isolate an object when applying this law.
identify the forces acting on an object and draw the free-body diagram for the object.
- B. Explain Newton's third law and apply it physical situations, including free body diagrams and problem solving.
- C. apply the terms static equilibrium, inertia, mass, net force, newton, normal force, friction force, coefficient of friction in problem solving.
give the relationship between mass and weight.
distinguish between actual and apparent weight.
state Newton's third law and point out the action-reaction pairs in simple situations.
combine Newton's second law with the kinematic equations to determine the motion of objects with constant forces on them.
resolve forces acting on an object on an incline into components parallel to and perpendicular to the incline and apply Newton's second law to various motions.
apply free-body diagrams, understanding of the functioning of scales and balances to solve simple problems in an accelerating reference frame.
- D. solve problems on inclines and with multiple blocks.

Reading

- A. 5-1 Force and Mass, p. 112
5-2 Newton's First Law of Motion, p. 112–114
5-3 Newton's Second Law of Motion, p. 114–122
- B. 5-4 Newton's Third Law of Motion, p. 122–125
- C. 5-5 The Vector Nature of Forces: Forces in Two Dimensions, p. 125–128
5-6 Weight, p. 128–132
5-7 Normal Forces, p. 132–137
6-1 Frictional Forces, p. 148–156
6-2 Strings and Springs, p. 157–161
6-3 Translational Equilibrium, p. 161–165
- D. 6-4 Connected Objects, p. 165–169

Focus Questions

- 1. Chapter 5, CQ7
- 2. Chapter 5, CQ14
- 3. You're opening a company that will export gourmet food from the earth to the moon. You want the package labels to be accurate at either location. How should you label the amount of food in each package – by mass or by weight? Explain.
- 4. Briefly explain why we resolve vectors into parallel and perpendicular components, rather than into x-y components, when solving for a block that might slide up or down an incline.