

Unit 3: Newton's Laws

Text:

Chapter 5: All sections of Chapter 5.

Chapter 6: All sections of Chapter 6.

Questions (p. 106-7)

1, 3, 7, 8, 10, 12

Problems (p. 108-15)

#1: 3, 4, 5, 7, 10, 12

#2: 19, 31, 32, 35, 47, 48, 49, 50, 84

#3: 57, 59, 76, 82, 97, 101

Questions (p. 130)

3, 4, 5, 6, 10

Problems (p. 131-39)

#4: 3, 7, 16, 17, 20, 30, 33, 34 (coefficient of friction)

#5: 41, 45, 47, 55, 59, 60 (centripetal acceleration)

#6: 87, 92, 97, 99, 107, 109

Vocabulary:

Inertia, force, net force, tension, weight, normal force, friction, static friction, kinetic friction, terminal speed, drag coefficient, coefficient of friction, Newton (as in unit of force)

Math:definitions: $\sum \vec{F} = m\vec{a}$ $f = \mu N$ derived formulas: $w = mg$ $w_{\perp} = mg \cos \theta$ $w_{\parallel} = mg \sin \theta$

skills: no new math skills

Key Objectives:

- state, explain and give examples of Newton's 3 Laws of Motion.
- compare and contrast mass and weight.
- define force, and explain its units (i.e. what is Newton?)
- draw and label and appropriate free-body diagram for any given situation/word problem.
- define friction and describe its effects on objects.
- define terminal speed, explain the factors that affect it, and describe what happens to the frictional forces, weight, and net force on an object that is freely falling.
- solve a variety of word problems involving multiple applied forces, tensions, and frictional forces.