

Laboratory Work for Each Part of the Course

Part One (Chapters 1–9)

SUGGESTED MINI-LABORATORY EXPLORATIONS

- 1 Our Place in Space (Sections P.2, 14.4) 75
- 2 Reviewing Graphs (Chapter 1 and Major Laboratories) 77
- 3 Falling Objects (Section 1.9) 80
- 4 Kepler's Third Law (Section 2.10) 80
- 5 Relative Motion (Chapter 2, Sections 3.9, 9.3) 81
- 6 Galileo and Inertia (Sections 3.1, 3.8, 3.9, 5.9, 5.10) 82
- 7 Finding the Centripetal Acceleration Vector (Sections 3.3, 3.12) 83
- 8 Three States of Matter (Chapter 7, Section 16.2, Major Laboratory "Heat Transfer and Latent Heat of Fusion") 85
- 9 How Do We Know That Atoms Really Exist? The Brownianscope (Section 7.8, Chapter 13) 86
- 10 Light and Color (Chapter 8, Part 2; Chapter 14.1) 86

SUGGESTED MAJOR LABORATORY EXPLORATIONS

- 1 Investigating Measurements and Uncertainty 89
- 2 Exploring Motion (Chapter 2) 94
- 3 Exploring the Heavens (Chapter 2) 100
- 4 Skyglobe: A Computer Planetarium (Chapter 2) 108
- 5 Exploring Forces (Section 3.4) 114
- 6 Exploring Force, Work, Energy, and Power (Chapters 3, 5, Section 6.3) 118
- 7 Finding the Mechanical Equivalent of Heat (Section 6.1) 123

- 8 Exploring Heat Transfer and the Latent Heat of Fusion
(Chapter 7, Section 16.2) 128
- 9 Investigating Waves (Chapter 8, Part 1) 134
- 10 Spacetime: A Computer Excursion into Relativity Theory (Chapter 9) 139

Part Two (Chapters 10–18)

SUGGESTED MINI-LABORATORY EXPLORATIONS

- 1 Our Place in Space (Sections P.2, 14.4) 75
- 2 Reviewing Graphs (Chapter 1 and Major Laboratories) 77
- 8 Three States of Matter (Chapter 7, Section 16.2, Major Laboratory
“Heat Transfer and Latent Heat of Fusion”) 85
- 9 How Do We Know That Atoms Really Exist? The Brownianscope
(Section 7.8, Chapter 13) 86
- 10 Light and Color (Chapter 8, Part 2, Section 14.1) 86
- 11 Spectroscopy (Chapter 14) 87
- 12 Radioactivity and Nuclear Half-Life (Chapter 17) 88

SUGGESTED MAJOR LABORATORY EXPLORATIONS

- 1 Investigating Measurements and Uncertainty 89
- 8 Exploring Heat Transfer and the Latent Heat of Fusion
(Chapter 7, Section 16.2) 128
- 11 Exploring Electric Charges, Magnetic Poles, and Gravitation (Chapter 10) 146
- 12 Investigating Electric Currents I (Chapters 10, 16) 152
- 13 Investigating Electric Currents II (Chapter 10) 156
- 14 Avogadro's Number and the Size and Mass of a Molecule (Chapters 7, 13) 161

In addition, one or more mini-laboratories might be joined together or expanded upon for use as a major laboratory on the later material.