



CHAPTER

10

Thermodynamics

334

1	Relationships Between Heat and Work	336
2	The First Law of Thermodynamics	342
	Why it Matters Gasoline Engines	348
	Why it Matters Refrigerators	350
3	The Second Law of Thermodynamics	352
	Why it Matters Deep-Sea Air Conditioning	358
	Highlights and Review	359
	Standardized Test Prep	364

CHAPTER

11

Vibrations and Waves

366

1	Simple Harmonic Motion	368
	Why it Matters Shock Absorbers	372
2	Measuring Simple Harmonic Motion	376
3	Properties of Waves	382
4	Wave Interactions	389
	Highlights and Review	395
	Standardized Test Prep	400
	Inquiry Lab Simple Harmonic Motion of a Pendulum	402
	Advanced Topics De Broglie Waves	922

Timeline—Physics and Its World: 1785–1830 404

CHAPTER

12

Sound

406

1	Sound Waves	408
	Why it Matters Ultrasound Images	410
2	Sound Intensity and Resonance	414
	Why it Matters Hearing Loss	421
3	Harmonics	422
	Why it Matters Reverberation	429
	PHYSICS CAREERS Piano Tuner	432
	Highlights and Review	433
	Standardized Test Prep	438
	Skills Practice Lab Speed of Sound	440
	CBL™ Lab Speed of Sound	938
	Advanced Topics The Doppler Effect and the Big Bang	912

Science, Technology and Society

Noise Pollution 442

