Planning Guides for *Physics: Principles and Problems*

Chapter/Section	Single-Class (180 days)	Block (90 days)
The Science of Matter and Energy		
1 What is physics?	**1**	**1**
Physics: The Search for Understanding	1/2	1/2
Chapter Review	1/2	1/2
2 A Mathematical Toolkit	**6**	**3 1/2**
2.1 The Measures of Science	1	1/2
2.2 Measurement Uncertainties	2	1 1/2
2.3 Visualizing Data	2	1
Chapter Review	1	1/2
Mechanics		
3 Describing Motion	**6**	**3 1/2**
3.1 Picturing Motion	2	1
3.2 Where and When?	1	1/2
3.3 Velocity and Acceleration	2	1 1/2
Chapter Review	1	1/2
4 Vector Addition	**6**	**4**
4.1 Properties of Vectors	2	1 1/2
4.2 Components of Vectors	3	2
Chapter Review	1	1/2
5 A Mathematical Model of Motion	**8**	**5**
5.1 Graphing Motion in One Dimension	1	1
5.2 Graphing Velocity in One Dimension	2	1 1/2
5.3 Acceleration	2	1
5.4 Free Fall	2	1
Chapter Review	1	1/2
6 Forces	**8**	**4 1/2**
6.1 Force and Motion	2	1
6.2 Using Newton's Laws	3	2
6.3 Interaction Forces	2	1
Chapter Review	1	1/2
7 Forces and Motion in Two Dimensions	**8**	**4 1/2**
7.1 Forces in Two Dimensions	2	1
7.2 Projectile Motion	3	2
7.3 Circular Motion	2	1
Chapter Review	1	1/2

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8 Universal Gravitation	**6**	**3 1/2**
8.1 Motion in the Heavens and on Earth	2	1
8.2 Using the Law of Universal Gravitation	3	2
Chapter Review	1	1/2
9 Momentum and Its Conservation	**6**	**3 1/2**
9.1 Impulse and Momentum	1	1
9.2 The Conservation of Momentum	4	2
Chapter Review	1	1/2
10 Energy, Work, and Simple Machines	**5**	**3**
10.1 Energy and Work	2	1
10.2 Machines	2	1 1/2
Chapter Review	1	1/2
11 Energy	**6**	**3 1/2**
11.1 The Many Forms of Energy	2	1
11.2 Conservation of Energy	3	2
Chapter Review	1	1/2
States of Matter		
12 Thermal Energy	**6**	**3 1/2**
12.1 Temperature and Thermal Energy	2	1
12.2 Change of State and Laws of Thermodynamics	3	2
Chapter Review	1	1/2
13 States of Matter	**6**	**3 1/2**
13.1 The Fluid States	3	2
13.2 The Solid State	2	1
Chapter Review	1	1/2
Waves and Light		
14 Waves and Energy Transfer	**6**	**3 1/2**
14.1 Wave Properties	2	1
14.2 Wave Behavior	3	2
Chapter Review	1	1/2
15 Sound	**5**	**3**
15.1 Properties of Sound	2	1 1/2
15.2 The Physics of Music	2	1
Chapter Review	1	1/2

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16 Light	**5**	**3**
16.1 Light Fundamentals	2	1 1/2
16.2 Light and Matter	2	1
Chapter Review	1	1/2
17 Reflection and Refraction	**6**	**3 1/2**
17.1 How Light Behaves at a Boundary	3	2
17.2 Applications of Reflected and Refracted Light	2	1
Chapter Review	1	1/2
18 Mirrors and Lenses	**6**	**3 1/2**
18.1 Mirrors	2	1
18.2 Lenses	3	2
Chapter Review	1	1/2
19 Diffraction and Interference of Light	**4**	**2 1/2**
19.1 When Light Waves Interfere	2	1
19.2 Applications of Diffraction	1	1
Chapter Review	1	1/2
Electricity		
20 Static Electricity	**6**	**3 1/2**
20.1 Electrical Charge	2	1
20.2 Electrical Force	3	2
Chapter Review	1	1/2
21 Electric Fields	**5**	**3**
21.1 Creating and Measuring Electric Fields	2	1
21.2 Applications of Electric Fields	2	1 1/2
Chapter Review	1	1/2
22 Current Electricity	**6**	**3 1/2**
22.1 Current and Circuits	3	2
22.2 Using Electric Energy	2	1/12
Chapter Review	1	1/2
23 Series and Parallel Circuits	**7**	**4**
23.1 Simple Circuits	3	1 1/2
23.2 Applications of Circuits	3	2
Chapter Review	1	1/2

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24 Magnetic Fields	**7**	**4**
24.1 Magnets: Permanent and Temporary	3	2
24.2 Forces Caused by Magnetic Fields	3	1 1/2
Chapter Review	1	1/2
25 Electromagnetic Induction	**6**	**3 1/2**
25.1 Creating Electric Current from Changing Magnetic Fields	3	2
25.2 Changing Magnetic Fields Induce *EMF*	2	1
Chapter Review	1	1/2
26 Electromagnetism	**5**	**3**
26.1 Interaction Between Electric and Magnetic Fields an Matter	3	2
26.2 Electric and Magnetic Fields in Space	1	1/2
Chapter Review	1	1/2
Modern Physics		
27 Quantum Theory	**5**	
27.1 Waves Behave Like Particles	2	
27.2 Particles Behave Like Waves	2	
Chapter Review	1	
28 The Atom	**6**	
28.1 The Bohr Model of the Atom	3	
28.2 The Quantum Model of the Atom	2	
Chapter Review	1	
29 Solid State Electronics	**5**	
29.1 Conduction in Solids	2	
29.2 Electronic Devices	2	
Chapter Review	1	
30 The Nucleus	**6**	
30.1 Radioactivity	3	
30.2 The Building Blocks of Matter	2	
Chapter Review	1	
31 Nuclear Applications	**6**	
31.1 Holding the Nucleus Together	2	
31.2 Using Nuclear Energy	3	
Chapter Review	1	