Physics, 3rd Edition
Lesson Plan Overview

Day(s)	Topic	Pages	Support Materials	Bible Integration**
Unit 1: A Framework				
Chapter 1: Foundations of Physics				
1	1A Why Study Physics?	1–5	See *PHYSICS* Support Materials CD	Kick off the year by helping students answer the question, "Why should a Christian study Physics?" The answer should involve helping people and glorifying God by fulfilling the Creation Mandate. Discuss how the Bible's story–Creation, Fall, and Redemption–play out in Physics.
2–3	1B What Is Physics?	5–15		Encourage each student to follow God's will for their life when choosing a career. Dispel students' misconceptions about what science is, does, and how it should be used. Emphasize that the goal of science is model-making, not establishing truth. God's Word does that. Encapsulate a Christian worldview for your students in Creation, Fall, and Redemption. Be sure to discuss Thomas Kuhn and how his philosophy of science dovetails into a discussion of worldview.
4	1C How Do Physicists Work?	16–21		Expose students to the joy and glory of doing science. They are no more human and God-like than when they are exercising dominion over God's world. Point out dominion science and modeling as a recurring feature in this textbook.
5	Chapter 1 Test*			
Chapter 2: Measurement				
6	2A Dimensions of Physics	22–30	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion modeling about the challenges of measuring the speed of light.
7	2B Principles of Measurement	31–35		Discuss why accuracy in measurements should be important to a Christian. Tie in the opening dominion modeling here by discussing how Ole Rømer measured the speed of light. Students will manipulate data from Table 2-3 in review questions.

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8–9	2C Truth in Measurements and Calculations	36–41		
10	2D Problem Solving	41–45		Put the problem-solving exercises in this book in context by motivating students to consider science as solving problems to help people.
11	Lab 2: Measurement			
12	Chapter 2 Test*			
Unit 2: Classical Mechanics				
Chapter 3: Motion in One Dimension				
13–14	3A Describing Motion	46–60	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion modeling about modeling the stopping distance of cars.
15	Lab 3-1: The Recording Timer			
16–17	3B Equations of Motion	61–71		Tie in the opening dominion modeling here by discussing how to model braking distance. Students will manipulate data from Table 3-1 in review questions.
18	Lab 3-2: Displacement, Velocity, and Acceleration			
19	Chapter 3 Test*			
Chapter 4: Vectors and Scalars				
20	4A Properties of Vectors and Scalars	72–76	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about how meteorologists need to accurately model hurricanes.
21	4B Operations with Vectors: Geometric Techniques	76–79		
22	Lab 4: Vectors			
23–24	4C Operations with Vectors: Mathematical Techniques	79–91		Tie in the opening dominion science problem here by discussing how meteorologists use vectors to model hurricanes. This helps us save people's lives.
25	Chapter 4 Test*			
Chapter 5: Motion in a Plane				
26	5A Kinematics of Two-Dimensional Motion	92–97	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about the need for humanitarian aid in inaccessible locations. When discussing frames of reference, ask students, "What is a Christian's frame of reference for life? How is this significant?"
27–28	5B Projections	97–111		Tie in the opening dominion science problem here by discussing airdrops and how they involve projectile motion.
29	Lab 5: Horizontal Projection			

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30	Chapter 5 Test*			
Chapter 6: Dynamics				
31	6A The History of Dynamics	112–116	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion science problem about how aircraft carriers operate and are used to maintain peace.
32	6B Forces	116–123		
33	Lab 6: Balanced and Unbalanced Forces			
34	6C Newton's Laws of Motion	123–135		Tie in the opening dominion science problem here by discussing aircraft catapults and arresting wires on aircraft carriers.
35	Chapter 6 Test*			
Chapter 7: Circular Motion				
36	7A Circular Motion	136–145	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion modeling about exploring Saturn's moons. Be sure to expose students to the driving force behind space exploration in an evolutionary science environment.
37	7B Dynamics of Circular Motion	146–150		
38	Lab 7: Circular Motion			
39–40	7C Universal Gravitation	151–163		Have students evaluate the philosophical implications of the Copernican Revolution. Tie in the opening dominion modeling here by discussing some of the properties of Saturn's moons. Students will manipulate data from Table 7-2 in review questions. Point out how this investigation is part of exercising dominion.
41	Chapter 7 Test*			
Chapter 8: Applying Newton's Laws				
42	8A Simplifying Problems	164–167	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about deaths and injuries due to head-on collisions.
43	8B Transmitting Mechanical Forces	168–175		
44	8C Friction	176–180		
45	8D More Applications	181–193		Tie in the opening dominion science problem here by discussing the ubiquitous and life-saving invention of Jersey barriers.
46	Lab 8: Transmitted Forces			
47	Chapter 8 Test*			
Chapter 9: Work and Energy				

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48	9A Work	194–201	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion science problem about the need to explore renewable energy resources.
49–50	9B Energy	202–210		
51	9C Total Mechanical Energy	211–217		Tie in the opening dominion science problem here by discussing hydropower and its benefits and challenges.
52	Lab 9: Conservation of Energy—Spring Constant			
53	Chapter 9 Test*			
Chapter 10: Conservation of Energy				
54	10A Total Mechanical Energy	218–225	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about developing safe elevators.
55	10B Simple Machines	226–237		Link the use of machines to the ability to better exercise dominion for your students. Tie in the opening dominion science problem here by discussing elevator safety mechanisms.
56	Lab 10: Mechanical Advantage—Efficiency			
57	Chapter 10 Test*			
Chapter 11: Momentum				
58–59	11A Principles of Momentum	238–245	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about car accident injuries and fatalities.
60–61	11B Collisions	246–256		Tie in the opening dominion science problem here by discussing the technology behind crash-test dummies.
62	11C Center of Mass and Angular Momentum	257–263		
63	Lab 11: Conservation of Momentum			
64	Chapter 11 Test*			
Chapter 12: Periodic Motion				
65	12A Simple Harmonic Motion	264–269	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion modeling about mach speed.
66	12B Periodic Motion and the Pendulum	270–276		Help students discern the difference between managing God's creation through divination versus dominion.
67	Lab 12-1: Period of a Pendulum			
68	12C Oscillations in the Real World	277–280		
69	12D Waves	280–291		Tie in the opening dominion modeling here by discussing how scientists and pilots model mach speed. Students will manipulate data from Table 12-3 in review questions. Highlight efforts to suppress sonic booms in populated areas.

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70	Lab 12-2: Speed of Sound in Air			
71	Chapter 12 Test*			
Unit 3: Thermodynamics and Matter				
Chapter 13: Properties of Matter				
72	13A Theories of Matter	292–298	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about replacing asbestos because of its health risks.
73	Lab 13: Length of a Molecule			
74–75	13B States of Matter	299–311		Tie in the opening dominion science problem here by discussing fiberglass insulation that replaces asbestos.
76	Chapter 13 Test*			
Chapter 14: Expansion and Temperature				
77	14A Thermal Properties	312–318	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about preemies who are born with major respiratory problems.
78	Lab 14-1: Coefficient of Thermal Expansion			
79	14B Measuring Temperature	319–323		
80–81	14C Gas Laws	324–337		Tie in the opening dominion science problem here by discussing Forrest Bird's inventions of ventilators for both infants and adults.
82	Lab 14-2:Charles's Law			
83	Lab 14-3: Boyle's Law			
84	Chapter 14 Test*			
Chapter 15: Thermal Energy and Heat				
85	15A Theories of Heat	338–342	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion modeling about why different metals are used for different purposes.
86–87	15B Thermal Energy and Matter	342–351		Tie in the opening dominion modeling here by discussing the specific heats of different metals. This helps people use the best metal for a purpose. Students will manipulate data from Table 15-2 in review questions.
88	Lab 15: Latent Heat of Fusion			
89	15C Mechanisms for Heat Transfer	352–357		
90	Chapter 15 Test*			
Chapter 16: Thermodynamic Laws				
91–92	16A The Zeroth and First Laws	358–366	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about how uncomfortable summer heat is!
93–94	16B The Second and Third Laws	358–374		Tie in the opening dominion science problem here by discussing the invention of the air conditioner and how it has transformed society.

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95	16C: Entropy and Its Consequences	374–381		Trigger student thought by linking entropy with biblical concepts like the current degradation of nature and the future of the universe.
96	Chapter 16 Test*			
Chapter 17: Fluid Mechanics				
97–98	17A Hydrostatics: Fluids at Rest	382–395	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about the need for localized energy sources.
99	Lab 17: Buoyancy			
100–101	17B: Hydrodynamics: Fluids in Motion	396–409		Tie in the opening dominion science problem here by discussing wind turbines and wind farms for energy generation. Highlight the opportunities and challenges in this effort of dominion.
102	Chapter 17 Test*			
Unit 4: Electromagnetics				
Chapter 18: Electric Charge				
103	18A Electrification	410–418	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion modeling about the challenges of figuring out the charge of a single electron. Tie in the opening dominion modeling here by discussing Millikan's oil drop experiment. Students will manipulate data from Millikan's original paper compiled in Table 18-1 in review questions.
104	18B Detecting Electric Charge	419–427		Highlight Faraday as an example of a Christian scientist.
105	Lab 18: Electrostatic Charges			
106	Chapter 18 Test*			
Chapter 19: Electric Fields				
107	19A Modeling the Electric Field	428–435	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about seeing really small defects in things like computer chips engineered on the atomic level. Tie in the opening dominion science problem here by discussing the technology behind scanning tunneling electron microscopes.
108–109	19B Capacitors	436–445		
110	Chapter 19 Test*			
Chapter 20: Electrodynamics				
111	20A Current, Voltage, and Resistance	446–453	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about the challenges in establishing transcontinental telephone service.
112	Lab 20-1: Batteries, Circuits, and Resistors			

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113	20B Electrical Circuits	454–462		
114	Lab 20-2: Series Circuits, and Lab 20-3: Parallel Circuits, if applicable			
115	20C Semiconductors and Transistors	463–473		Tie in the opening dominion science problem here by discussing the historical development of the integrated circuit. Go further in stimulating student thought by asking the question, "Can non-believing scientists like the ones who invented the IC help exercise dominion?"
116	Chapter 20 Test*			
Chapter 21: Magnetism				
117	21A Describing Magnetism	474–481	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion modeling about understanding the mass-to-charge ratio of an electron. Inspire your students to see how God protects His creation with the magnetosphere.
118	Lab 21: Mapping a Magnetic Field			
119	21B Electromagnetism and Charges	482–490		Tie in the opening dominion modeling here by discussing Thomson's experiment using the cathode ray tube. Students will manipulate data from Thomson's original paper compiled in Table 21-2 in review questions.
120	21C Electromagnetism and Conductors	491–497		
121	Chapter 21 Test*			
Chapter 22: Electromagnetism				
122	22A Currents and Magnetic Fields	498–505	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about the challenges in providing electricity for the US population.
123	22B Alternating Current	506–512		Tie in the opening dominion science problem here by discussing the current AC power distribution system in the United States.
124	Lab 22-1: Electrical Work			
125	22C AC Circuit Characteristics	513–521		Highlight Maxwell as a Christian who used his scientific capabilities to influence his field for God's glory.
126	Lab 22-2: Capacitors, Diodes, and Transistors			
127	Chapter 22 Test*			
Unit 5: Geometric Optics and Light				
Chapter 23:Light and Reflection				

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128	23A Light and the Electromagnetic Spectrum	522–528	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion modeling about understanding planetary albedo.
129	23B Sources and Propagation of Light	529–534		
130–131	23C Reflection and Mirrors	535–549		Tie in the opening dominion modeling here by discussing how scientists measure and interpret albedos of astronomical bodies. Students will manipulate data from Table 23-1 in review questions. Pull in a discussion of albedo and current concerns about global warming.
132	Lab 23-1:Plane Mirror Reflections			
133	Lab 23-2: Curved Mirror Reflections			
134	Chapter 23 Test*			
Chapter 24: Refraction				
135–136	24A Theory of Refraction	550–559	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion modeling about the refraction of different types of glasses. Different glasses can be used in different ways. Highlight how God used light dispersion in a rainbow as a symbol of God's promise to Noah. Tie in the opening dominion modeling here by discussing different glasses and their refraction data. Students will manipulate data from Table 24-3 in review questions. Pull in a discussion on recycling glass as an issue of stewardship.
137	Lab 24-1: Refraction			
138	24B Application of Refraction—Lenses	559–571		
139	Lab 24-2: Focal Length of a Thin Lens			
140	Chapter 24 Test*			
Chapter 25: Wave Optics				
141	25A Wave Interference	572–583	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about counterfeiting, especially counterfeited medications.
142	25B Diffraction	584–588		Tie in the opening dominion science problem here by discussing holograms that reduce counterfeiting of medications.
143	Lab 25: Reflected Diffraction			
144	25C Polarization of Light	589–595		
145	Chapter 25 Test*			

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Chapter 26: Using Light				
146–147	26A Intensity and Color	596–605	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion science problem about archiving pictures for posterity.
148	Lab 26: Illuminance and Luminous Flux			
149	26B Optical Instruments	606–615		Tie in the opening dominion science problem here by discussing CCDs used in digital cameras.
150	Chapter 26 Test*			
Unit 6: Modern Physics				
Chapter 27: Relativity				
151	27A: Galilean Relativity	616–624	See *PHYSICS* Support Materials CD	Open the chapter by discussing the dominion science problem about increasing the accuracy of GPS.
152–153	27B: Special Relativity	625–633		
154	27C: General Relativity	634–639		Tie in the opening dominion science problem here by discussing how GPS receivers use relativity to correct position measurements.
155	Chapter 27 Test*			
Chapter 28: Quantum Physics				
156	28A: Quantum Theory	640–645	See *PHYSICS* Support Materials CD	Kick off the chapter by discussing the dominion science problem about securing sensitive information.
157	28B: Quantum Mechanics and the Atom	646–651		
158	28C: Modern Atomic Models	652–661		Tie in the opening dominion science problem here by discussing quantum cryptography. Use this to open up a discussion on how dominion sometimes involves fighting against the fallen nature of man.
159	Chapter 28 Test*			
Chapter 29: Nuclear Physics				
160	29A Radiation and Radioactivity	662–670	See *PHYSICS* Support Materials CD	Begin the chapter by discussing the dominion modeling about finding out the ages of historical finds like the Dead Sea Scrolls.
161	29B Radioactive Decay	671–677		Expose your students to the presuppositions and assumptions behind radioactive dating and geochronology. Tie in the opening dominion modeling here by discussing the assumptions and uses of radiocarbon dating. Students will manipulate data from Table 29-3 in review questions.
162	Lab 29-1: Radioactive Decay Simulation			

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163	29C Nuclear Reactions	678–683		Open up a discussion on the potential opportunities and challenges to fusion energy.
164	29D Subatomic Particles	684–692		
165	Lab 29-2: Elementary Nuclear Particles			
166	Chapter 29 Test*			

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