

Correlation to Show Compatibility of *Physics: Principles & Problems* with the Next Generation Science Standards Disciplinary Core Ideas

Physics: Principles & Problems provides optimal flexibility for the initial implementation of the Next Generation Science Standards (NGSS) into your curriculum. This correlation to the Disciplinary Core Ideas (DCIs) will help guide and inform your curriculum decisions as you transition the NGSS into your science instruction.

Lesson Title	Disciplinary Core Ideas	Pages
Chapter 1 • A Physics Toolkit		
1 Methods of Science		4-9
2 Mathematics and Physics		10-13
3 Measurement		14-17
4 Graphing Data		18-31
Chapter 2 • Representing Motion		
1 Picturing Motion	This topic is a prerequisite to PS2.A.	34-36
2 Where and When?	This topic is a prerequisite to PS2.A.	37-40
3 Position-Time Graphs	This topic is a prerequisite to PS2.A.	41-45
4 How Fast?	This topic is a prerequisite to PS2.A.	46-57
Chapter 3 • Accelerated Motion		
1 Acceleration	This topic is a prerequisite to PS2.A.	60-67
2 Motion with Constant Acceleration	This topic is a prerequisite to PS2.A.	68-74
3 Free Fall	This topic is a prerequisite to PS2.A.	75-87
Chapter 4 • Forces in One Dimension		
1 Force and Motion	PS2.A	90-99
2 Weight and Drag Force	PS2.A	100-105
3 Newton's Third Laws	PS2.A	106-119
Chapter 5 • Displacement and Force in Two Dimensions		
1 Vectors	PS2.A	122-129
2 Friction	PS2.A, PS2.B	130-135
3 Forces in Two Dimensions	PS2.A	136-149

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Chapter 6 • Motion in Two Dimensions

1 Projectile Motion	PS2.A	152-158
2 Circular Motion	PS2.A	159-163
3 Relative Velocity	PS2.A	164-175

Chapter 7 • Gravitation

1 Planetary Motion and Gravitation	PS2.B	178-185
2 Using the Law of Universal Gravitation	PS2.B	186-201

Chapter 8 • Rotational Motion

1 Describing Rotational Motion	This topic is an extension of PS2.A.	204-207
2 Rotational Dynamics	This topic is an extension of PS2.A.	208-218
3 Equilibrium	This topic is an extension of PS2.A.	219-233

Chapter 9 • Momentum and Its Conservation

1 Impulse and Momentum	PS1.A, PS2.B	236-243
2 Conservation of Momentum	PS1.A, PS2.B	244-261

Chapter 10 • Work, Energy, and Machines

1 Work and Energy	PS3.A	264-273
2 Machines	This topic is an extension of PS3.A.	274-289

Chapter 11 • Energy and Its Conservation

1 The Many Forms of Energy	PS3.A, PS3.B	292-300
2 Conservation of Energy	PS3.A, PS3.B	301-317

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Chapter 12 • Thermal Energy

1 Temperature, Heat, and Thermal Energy	PS3.A, PS3.B	320-329
2 Changes of State and Thermodynamics	PS3.A, PS3.B, PS3.D	330-345

Chapter 13 • States of Matter

1 Properties of Fluids	PS1.A	348-355
2 Forces Within Liquids	PS1.A	356-358
3 Fluids at Rest and in Motion	PS1.A	359-366
4 Solids	PS1.A	367-379

Chapter 14 • Vibrations and Waves

1 Periodic Motion	PS3.B, PS4.A	382-387
2 Wave Properties	PS4.A	388-393
3 Wave Behaviour	PS4.A	394-407

Chapter 15 • Sound

1 Properties and Detection of Sound	PS3.A, PS4.A	410-417
2 The Physics of Music	PS3.A, PS4.A	418-435

Chapter 16 • Fundamentals of Light

1 Illumination	PS3.A, PS4.B	438-446
2 The Wave Nature of Light	PS4.A, PS4.B	447-461

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Chapter 17 • Reflection and Mirrors		
1 Plane Mirrors	This topic is an application of PS4.A.	464-470
2 Curved Mirrors	This topic is an application of PS4.A.	471-489
Chapter 18 • Refraction and Lenses		
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2 Convex and Concave Lenses	This topic is an application of PS4.A.	500-507
3 Applications of Lenses	This topic is an application of PS4.A.	508-519
Chapter 19 • Interference and Diffraction		
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2 Diffraction	PS4.A, PS4.B	531-545
Chapter 20 • Static Electricity		
1 Electric Charge	PS1.A, PS2.B	548-552
2 Electrostatic Force	PS1.A, PS2.B	553-567
Chapter 21 • Electric Fields		
1 Measuring Electric Fields	PS1.A, PS2.B	570-576
2 Applications of Electric Fields	PS2.B, PS3.B	577-595
Chapter 22 • Electric Current		
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Chapter 23 • Series and Parallel Circuits		
1 Simple Circuits	This topic is an application of PS3.A.	624-634
2 Applications of Circuits	This topic is an application of PS3.A.	635-647

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1 Understanding Magnetism	PS1.A, PS2.B	650-657
2 Applying Magnetic Forces	PS2.B, PS3.C	658-673
Chapter 25 • Electromagnetic Induction		
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2 Applications of Induced Currents	PS2.B, PS3.B, PS3.C, PS3.D	684-699
Chapter 26 • Electromagnetism		
1 Electric and Magnetic Forces on Particles	PS1.A, PS2.B, PS4.C	702-709
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Chapter 27 • Quantum Theory		
1 A Particle Model of Waves	PS1.A, PS3.B, PS4.B, PS4.C	728-740
2 Matter Waves	PS4.B	741-749
Chapter 28 • The Atom		
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2 The Quantum Model of the Atom	PS1.A, PS2.B, PS3.B, PS4.C	765-775
Chapter 29 • Solid-State Electronics		
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2 Electronic Components	PS1.A, PS2.B, PS4.C	787-799
Chapter 30 • Nuclear and Particle Physics		
1 The Nucleus	PS1.A, PS1.C, PS2.B, PS3.A	802-707
2 Nuclear Decay and Reactions	PS1.A, PS1.C, PS2.B	808-817
3 The Building Blocks of Matter	PS1.A, PS1.C	818-833