

Alignment Between the Indiana REPA Educator Standards for Science—Physics and state and national student and teacher standards for Science—Physics

The alignment notations below indicate the content included in state and national standards that is addressed, in whole or in part, by each of the REPA Educator Standards for Science—Physics.

Standard 1: The Nature and Processes of Science	
Physics teachers have a broad and comprehensive understanding of the nature of science and the processes of scientific inquiry.	
Indiana Academic Standards for Science – Physics I (2016)	<p>SEPS.1 Posing questions SEPS.2 Developing and using models and tools SEPS.3 Constructing and performing investigations SEPS.4 Analyzing and interpreting data SEPS.5 Using mathematics and computational thinking SEPS.6 Constructing explanations SEPS.7 Engaging in argument from evidence SEPS.8 Obtaining, evaluating, and communicating information</p> <p>LST.1: Learning Outcome for Literacy in Science/Technical Subjects (Reading, Writing): 11-12.LST1.1 LST.2: Key Ideas and Textual Support (Reading): 11-12.LST2.1, 11-12.LST2.2, 11-12.LST2.3 LST.3: Structural Elements and Organization (Reading): 11-12.LST3.1, 11-12.LST3.2, 11-12.LST3.3 LST.4: Synthesis and Connection of Ideas (Reading): 11-12.LST4.1, 11-12.LST4.2, 11-12.LST4.3 LST.5: Writing Genres (Writing): 11-12.LST.5.2</p> <p>Standard 1: Constant Velocity: PI.1.1-3 Standard 2: Uniform Acceleration: PI.2.1-5 Standard 3: Forces: PI.3.2-3,5 Standard 4: Energy: PI.4.1,4,6 Standard 5: Linear Momentum in One Dimension: PI.5.1-2,6 Standard 6: Simple Harmonic Oscillating Systems: PI.6.1-4 Standard 7: Mechanical Waves and Sound: PI.7.3-4 Standard 8: Simple Circuit Analysis: PI.8.1-4</p>
Indiana Academic Standards for Science – Physics II (2016)	<p>SEPS.1 Posing questions SEPS.2 Developing and using models and tools SEPS.3 Constructing and performing investigations SEPS.4 Analyzing and interpreting data SEPS.5 Using mathematics and computational thinking SEPS.6 Constructing explanations SEPS.7 Engaging in argument from evidence SEPS.8 Obtaining, evaluating, and communicating information</p> <p>LST.1: Learning Outcome for Literacy in Science/Technical Subjects (Reading, Writing): 9-10.LST1.1 LST.2: Key Ideas and Textual Support (Reading): 9–10.LST2.1, 9–10.LST2.2, 9–10.LST2.3</p>

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	<p>LST.3: Structural Elements and Organization (Reading): 9–10.LST3.1, 9–10.LST3.2, 9–10.LST3.3 LST.4: Synthesis and Connection of Ideas (Reading): 9–10.LST4.1, 9–10.LST4.2, 9–10.LST4.3 LST.5: Writing Genres (Writing): 11–12.LST.5.2</p> <p>Standard 2: Temperature and Thermal Energy Transfer: PII.2.1, PII.2.4–6 Standard 3: Fluids: PII.3.1 Standard 4: Electricity: PII.4.2–4 Standard 5: Simple and Complex Circuits: PII.5.2–3 Standard 6: Magnetism: PII.6.2 Standard 7: Electromagnetic Induction: PII.7.2 Standard 8: Geometric Optics: PII.8.1–3 Standard 9: Particle and Wave Nature of Light: PII.9.3–6</p>
Next Generation Science Standards (NGSS) (2013)	Science and Engineering Practices: SEP.1, SEP.2, SEP.3, SEP.4, SEP.5, SEP.6, SEP.7, SEP.8
NSTA Standards for Science Teacher Preparation (2012)	Standard 4: Safety: 4a–b
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.10 Physics Table B: B.21
Standard 2: Central Concepts and Connections in Science	
Physics teachers have a comprehensive understanding of the core ideas in other science disciplines and of the relationships between science, engineering, technology, and society.	
Indiana Academic Standards for Science – Physics I (2016)	
Indiana Academic Standards for Science – Physics II (2016)	Standard 6: Magnetism: PII.6.5
Next Generation Science Standards (NGSS) (2013)	<p>HS-PS1 Matter and Its Interactions: PS1.A, PS1.B HS-PS4 Waves and Their Applications in Technologies for Information Transfer: PS4.C HS-LS1 From Molecules to Organisms: Structures and Processes: LS1.A, LS1.B, LS1.C HS-LS2 Ecosystems: Interactions, Energy, and Dynamics: LS2.A, LS2.B, LS2.C, LS2.D HS-LS3 Heredity: Inheritance and Variation of Traits: LS3.A, LS3.B HS-LS4 Biological Evolution: Unity and Diversity: LS4.A, LS4.B, LS4.C, LS4.D HS-ESS1 Earth’s Place in the Universe: ESS1.A, ESS1.B, ESS1.C HS-ESS2 Earth’s Systems: ESS2.A, ESS2.B, ESS2.C, ESS2.D, ESS2.E HS-ESS3 Earth and Human Activity: ESS3.A, ESS3.B, ESS3.C, ESS3.D HS-ETS1 Engineering Design: ETS1.A, ETS1.B, ETS1.C Science and Engineering Practices: SEP.1, SEP.2 Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7</p>

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NSTA Standards for Science Teacher Preparation (2012)	Standard 1: Content Knowledge: 1b
NSTA Secondary Science Content Analysis Form (2012)	Chemistry Table A: A.1-15 Chemistry Table B: B.26 Earth/Space Science Table A: A.1-12 Earth/Space Science Table B: B.19-20 Biology Table A: A.1-13 Biology Table B: B.17-18 Physics Table A: A.11 Physics Table B: B.19-20, B.22
Standard 3: Motion and Forces	
Physics teachers have a broad and comprehensive understanding of motion, forces, and Newton's laws in one and two dimensions.	
Indiana Academic Standards for Science – Physics I (2016)	Standard 1: Constant Velocity: PI.1.1-4 Standard 2: Uniform Acceleration: PI.2.1-5 Standard 3: Forces: PI.3.1-7
Indiana Academic Standards for Science – Physics II (2016)	Standard 3: Fluids: PII.3.1-5
Next Generation Science Standards (NGSS) (2013)	HS-PS2 Motion and Stability: Forces and Interactions: PS2.A, PS2.B Science and Engineering Practices: SEP.2, SEP.5 Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.2-3
Standard 4: Energy and Momentum	
Physics teachers have a broad and comprehensive understanding of the conservation of energy and momentum.	
Indiana Academic Standards for Science – Physics I (2016)	Standard 4: Energy: PI.4.1-6 Standard 5: Linear Momentum in One Dimension: PI.5.1-6
Indiana Academic Standards for Science – Physics II (2016)	Standard 1: Energy and Momentum in Two Dimensions: PII.1.1-4 Standard 4: Electricity: PII.4.7
Next Generation Science Standards (NGSS) (2013)	HS-PS2 Motion and Stability: Forces and Interactions: PS2.A, PS2.B HS-PS3 Energy: PS3.A, PS3.B, PS3.C, PS3.D Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.1, A.4 Physics Table B: B.14

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Standard 5: Thermodynamics and Kinetic Theory	
Physics teachers have a broad and comprehensive understanding of the laws of thermodynamics and the kinetic theory of matter.	
Indiana Academic Standards for Science – Physics I (2016)	
Indiana Academic Standards for Science – Physics II (2016)	Standard 2: Temperature and Thermal Energy Transfer: PII.2.1-6
Next Generation Science Standards (NGSS) (2013)	HS-PS3 Energy: PS3.A, PS3.B, PS3.D Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.1, A.6 Physics Table B: B.12
Standard 6: Electricity and Magnetism	
Physics teachers have a broad and comprehensive understanding of electricity and magnetism.	
Indiana Academic Standards for Science – Physics I (2016)	Standard 8: Simple Circuit Analysis: PI.8.1-9
Indiana Academic Standards for Science – Physics II (2016)	Standard 4: Electricity: PII.4.1-7 Standard 5: Simple and Complex Circuits: PII.5.1-5 Standard 6: Magnetism: PII.6.1-5 Standard 7: Electromagnetic Induction: PII.7.1-3 Standard 9: Particle and Wave Nature of Light: PII.9.1-4
Next Generation Science Standards (NGSS) (2013)	HS-PS2 Motion and Stability: Forces and Interactions: PS2.B HS-PS3 Energy: PS3.A, PS3.C, PS3.D HS-PS4 Waves and Their Applications in Technologies for Information Transfer: PS4.A, PS4.B, PS4.C Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.9 Physics Table B: B.18, B.22
Standard 7: Vibrations and Waves	
Physics teachers have a broad and comprehensive understanding of vibrations and waves and the application of wave properties to sound and light.	
Indiana Academic Standards for Science – Physics I (2016)	Standard 6: Simple Harmonic Oscillating Systems: PI.6.1-5 Standard 7: Mechanical Waves and Sound: PI.7.1-7
Indiana Academic Standards for Science – Physics II (2016)	Standard 8: Geometric Optics: PII.8.1-4 Standard 9: Particle and Wave Nature of Light: PII.9.5-6

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Next Generation Science Standards (NGSS) (2013)	HS-PS2 Motion and Stability: Forces and Interactions: PS2.A, PS2.B HS-PS3 Energy: PS3.A, PS3.B HS-PS4 Waves and Their Applications in Technologies for Information Transfer: PS4.A, PS4.B Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.8 Physics Table B: B.17
<u>Standard 8: Modern Physics</u>	
Physics teachers have a broad and comprehensive understanding of the fundamental ideas of modern physics.	
Indiana Academic Standards for Science – Physics I (2016)	
Indiana Academic Standards for Science – Physics II (2016)	Standard 9: Particle and Wave Nature of Light: PII.9.2 Standard 10: Modern Physics: PII.10.1-5
Next Generation Science Standards (NGSS) (2013)	HS-PS1 Matter and Its Interactions: PS1.A, PS1.C HS-PS3 Energy: PS3.A, PS3.B, PS3.C, PS3.D HS-PS4 Waves and Their Applications in Technologies for Information Transfer: PS4.A, PS4.B, PS4.C Crosscutting Concepts: CCC.1, CCC.2, CCC.3, CCC.4, CCC.5, CCC.6, CCC.7
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Physics Table A: A.6, A.7 Physics Table B: B.15-17, B.20
<u>Standard 9: Science Instruction and Assessment</u>	
Physics teachers have a broad and comprehensive understanding of content-specific instruction and assessment in science.	
Indiana Academic Standards for Science – Physics I (2016)	
Indiana Academic Standards for Science – Physics II (2016)	
Next Generation Science Standards (NGSS) (2013)	
NSTA Standards for Science Teacher Preparation (2012)	
NSTA Secondary Science Content Analysis Form (2012)	Standard 1: Content Knowledge: 1.a, 1c Standard 2: Content Pedagogy: 2a-c Standard 3: Learning Environment: 3a-d Standard 4: Safety: 4a-c Standard 5: Impact on Student Learning: 5c