LAB-AIDS Alignment to

Science High School Course Maps for Earth and Space Sciences Courses

Regents Examination in Science[1]

The New York State P-12 Science Learning Standards are based on guiding documents (*A Framework for K-12 Science Education* and the Next Generation Science Standards) grounded in the most current research in science and scientific learning. They reflect the importance of every student's engagement with natural scientific phenomena at the nexus of three dimensions of learning: Science and Engineering Practices, Disciplinary Core Ideas, and Cross-Cutting Concepts. Performance expectations are the way to integrate the three dimensions guiding student sense-making of science as discussed in the New York State P-12 Science Learning Standards Introduction.

Key Notes: Diagram 1 (p. 3) provides visual representation:

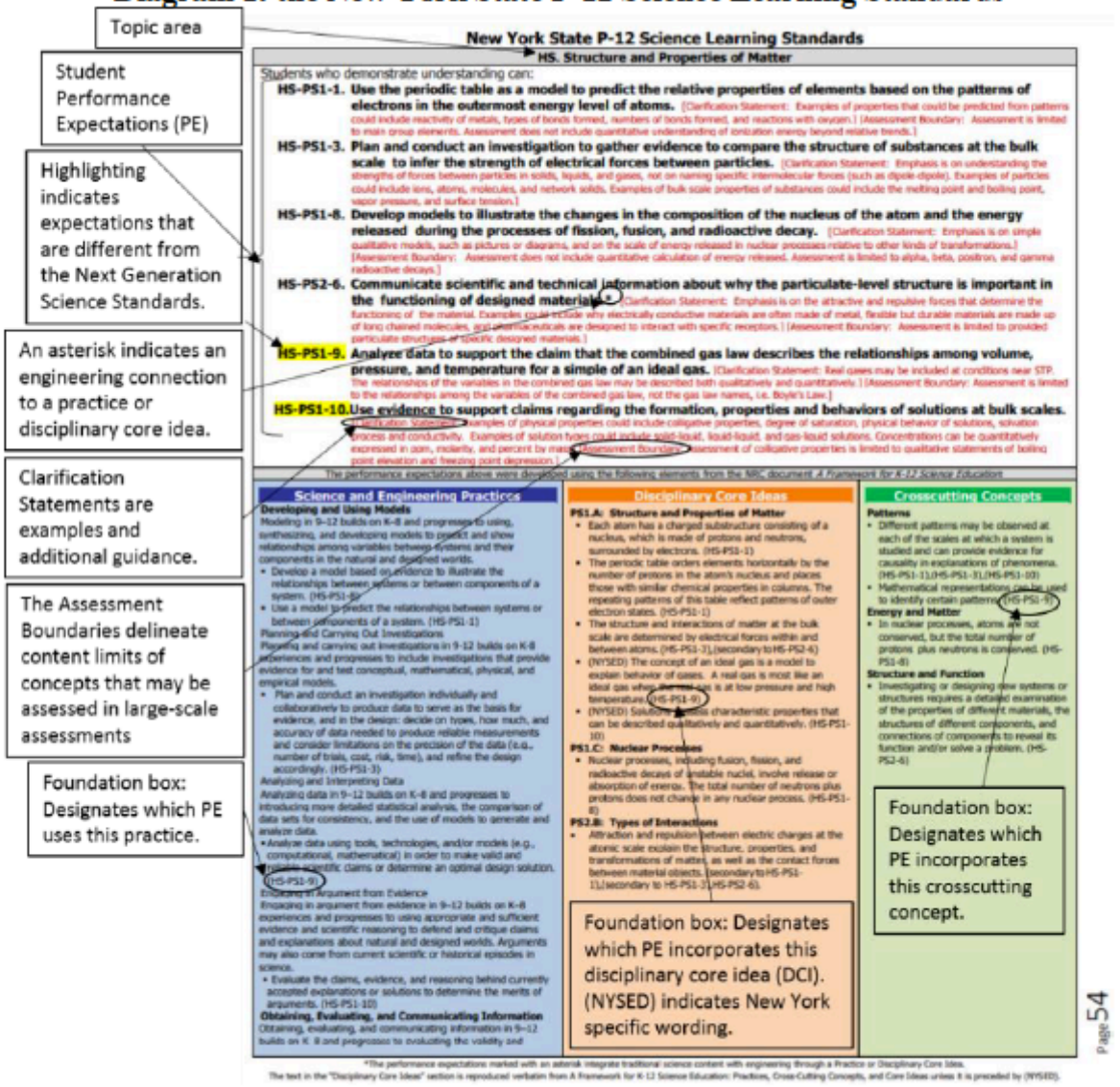
1. In order to eliminate potential redundancy, seek an appropriate grain size, and seek natural connections among the Disciplinary Core Ideas (DCIs) identified within A Framework for K-12 Science Education. New York State arranged the performance expectations into topics.
2. Student performance expectations (PEs) may be taught in any sequence or grouping within a course.
3. The highlighted performance expectations are performance expectations that are unique to New York State.
4. An asterisk (*) indicates an engineering connection to a practice, core idea, or crosscutting concept.
5. The Clarification Statements are examples and additional guidance for the instructor. (NYSED) or a highlight indicates New York specific statement/wording.
6. The Assessment Boundaries delineate content limits of concepts that may be assessed in large-scale assessments.
7. Within the standards, the section entitled "foundation boxes" is reproduced verbatim from A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, except for statements that contain (NYSED). The material is integrated and reprinted with permission from the National Academy of Sciences.
8. Within the standards, Three Connection Boxes (not shown in the diagram), located below the Foundation Boxes, are designed to support a coherent vision of the standards by showing how the performance expectations in each standard connect to other PEs in science, as well as to Common Core State Standards.

[1] http://www.nysed.gov/common/nysed/files/programs/curriculum-instruction/ess.pdf

The three boxes include:

- Connections to other DCIs in this grade level. This box contains the names of science topics in other disciplines that have related disciplinary core ideas at the same grade level. For example, both Physical Science and Life Science performance expectations contain core ideas related to Photosynthesis and could be taught in relation to one another.
- Articulation of DCIs across grade levels. This box contains the names of other science topics that either 1) provide a foundation for student understanding of the core ideas in this set of performance expectations (usually at prior grade levels); or 2) build on the foundation provided by the core ideas in this set of PEs (usually at subsequent grade levels).
- Connections to the New York State Next Generation Learning Standards. This box contains the coding and names of New York State Next Generation Mathematics Learning Standards (2017), and New York State Next Generation English Language Arts Learning Standards (Revised 2017) that align to the performance expectations. An effort has been made to ensure that the mathematical skills students need for science were taught in a previous year where possible.

Diagram 1: the New York State P-12 Science Learning Standards



Topic	PE #	K-12 Science Education Framework: Scientific and Engineering Practices	K-12 Science Education Framework: Disciplinary Core Ideas	K-12 Science Education Framework: Crosscutting Concepts	Location in EDC Earth Science (Revised 2022) Chapter and pages
Systems	HS-ESS1-1	Developing and Using Models	ESS1.A: The Universe and Its Stars; PS3.D: Energy in Chemical Process and Everyday Life	Scale, Proportions and Quantity	8: 200-203, 212-215
HS. Space Systems	HS-ESS1-2	Constructing Explanations and Designing Solutions	ESS1.A: The Universe and Its Stars;		8: 200-206
			PS4.B: Electromagnetic Radiation	Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering and Technology; Energy and Matter; Connection to Nature of Science Scientific Knowledge Assumes an Order and Consistency in Natural Systems	
HS. Space Systems	HS-ESS1-3	Obtaining, Evaluating and Communicating Information	ESS1.A: The Universe and Its Stars	Energy and Matter;	8: 200-201

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HS. Space Systems	HS-ESS1-4	Using Mathematics and Computational Thinking	ESS1.B: Earth and The Solar System	Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering and Technology; Scale, Proportions and Quantity	8: 208-209
HS. History of Earth	HS-ESS1-5	Engaging in Argument from Evidence	ESS1.C: The History of Planet Earth; ESS2.B: Plate Tectonics and Large-Scale System Interactions; PS1.C: Nuclear Processes	Patterns	10: 256-260 12: 342-347 14: 399-401, 415-426
HS. History of Earth	HS-ESS1-6	Constructing Explanations and Designing Solutions; Connection to Nature of Science: Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena	ESS1.C: The History of Planet Earth	Stability and Change	9: 195-199, 203-206 14: 415-426

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HS. Space Systems	HS-ESS1-7	Constructing Explanations and Designing Solutions;	ESS1.B: Earth and The Solar System	Patterns	
HS. History of Earth	HS-ESS2-1	Developing and Using Models	ESS2.A: Earth Materials and Systems; ESS2.B: Plate Tectonics and Large-Scale System Interactions	Stability and Change	9: 241-244 10: 250-279 11: 289-322 12: 336-345, 350-352 13: 363-389 14: 415-426
HS. Earth's Systems	HS-ESS2-2	Analyzing and Interpreting Data	ESS2.A: Earth Materials and Systems	Stability and Change; Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering, and Technology	3: 66-70, 72-76 4: 102-106 5: 115-135 6: 155-1649: 241-244 11: 317-319 12: 342-352
Earth's Systems	HS-ESS2-3	Developing and Using Models; Connection to Nature of Science Scientific Knowledge is Based on Empirical Evidence	ESS2.A: Earth Materials and Systems; ESS2.B: Plate Tectonics and Large-Scale System Interactions; PS4.A: Wave Properties	Energy and Matter; Connections to Engineering, Technology, and Applications of Science Interdependence of Science, Engineering, and Technology	9: 241-244 11: 317-319 12: 342-352

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HS. Earth's Systems	HS-ESS2-5	Planning and Carrying Out Investigations	ESS2.C: The Roles of Water in Earth's Surface Processes	Structure and Function	2:24-35 3: 58-76 4: 99-103 5: 116-124, 133-135 6: 165-175
HS. Earth's Systems	HS-ESS2-6	Developing and Using Models	ESS2.D: Weather and climate	Energy and Matter Physical and chemical aspects of the geochemical cycling of carbon.	5: 124-135 6: 160-163
HS. Earth's Systems	HS-ESS2-7	Engaging in Argument from Evidence	ESS2.D: Weather and climate; ESS2.E: Biogeology	Stability and Change Changes in the atmosphere from plants and other organisms along with feedback mechanisms.	2: 36-40 5: 127-135 6: 165-178 13: 387-389 14: 425-426 15: 447-453 16: 479-485
HS. Weather and Climate	HS-ESS2-4	Developing and Using Models; Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence	ESS2.A: Earth Materials and Systems; ESS2.D: Weather and climate; ESS1.B: Earth and The Solar System	Cause and Effect	3: 66-76 4: 94-98 5: 115-123 6: 165-178
HS. Weather and Climate	HS-ESS2-8	Obtaining, Evaluating, and	ESS2.D: Weather and climate	Patterns; Cause and Effect	4: 97-98, 102-103, 104-106

Topic	PE #	K-12 Science Education Framework: Scientific and Engineering Practices	K-12 Science Education Framework: Disciplinary Core Ideas	K-12 Science Education Framework: Crosscutting Concepts	Location in EDC Earth Science (Revised 2022) Chapter and pages
		Communicating Information			
HS. Weather and Climate	HS-ESS3-5	Analyzing and Interpreting Data; Connections to Nature of Science Scientific Investigations Use a Variety of Methods; Scientific Knowledge is Based on Empirical Evidence	ESS3.D: Global Climate Change	Stability and Change	6: 165-178
HS. Human Sustainability	HS-ESS3-1	Constructing Explanations and Designing Solutions	ESS3.A: Natural Resources; ESS3.B: Natural Hazards	Cause and Effect; Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering, and Technology on Society and the Natural World	2: 18-20, 38-40 10: 250-253, 283-284 11: 290-292, 321-322 13: 358-361, 387-389 15: 432-435, 444-456 16: 461-468, 479-485
HS. Human Sustainability	HS-ESS3-2	Engaging in Argument from Evidence	ESS3.A: Natural Resources; ETS1.B: Developing Possible Solutions	Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering, and Technology on	16: 482-484

Topic	PE #	K-12 Science Education Framework: Scientific and Engineering Practices	K-12 Science Education Framework: Disciplinary Core Ideas	K-12 Science Education Framework: Crosscutting Concepts	Location in EDC Earth Science (Revised 2022) Chapter and pages
				Society and the Natural World; Connections to Nature of Science Science Addresses Questions About the Natural and Material World	
HS. Human Sustainability	HS-ESS3-3	Using Mathematics and Computational Thinking	ESS3.C: Human Impacts on Earths Systems	Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering, and Technology on Society and the Natural World; Connections to Nature of Science Science is a Human Endeavor;	2:18-23 5: 127-132 6: 165-178 16: 463-467
HS. Human Sustainability	HS-ESS3-4	Constructing Explanations and Designing Solutions	ESS3.C: Human Impacts on Earths Systems	Stability and Change; Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering,	2: 38-40 13: 387-389 16: 479-481

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				and Technology on Society and the Natural World	
HS. Human Sustainability	HS-ESS3-6	Using Mathematics and Computational Thinking	ESS3.D: Global Climate Change; ESS2.D: Weather and climate	Systems and System Models	5: 127-135 6: 165-175
HS. Engineering Design	HS-ETS1-1	Asking Questions and Defining Problems	ETS1.A: Defining and Delimiting Engineering Problems	Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering, and Technology on Society and the Natural World	
Design	HS-ETS1-2	Constructing Explanations and Designing Solutions	ETS1.C: Optimizing the Design Solution		
HS. Engineering Design	HS-ETS1-3	Constructing Explanations and Designing Solutions	ETS1.B: Developing Possible Solutions	Connections to Engineering, Technology, and Applications of Science Influence of Science, Engineering, and Technology on Society and the Natural World	

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HS. Engineering Design	HS-ETS1-4.	Using Mathematics and Computational Thinking	ETS1.B: Developing Possible Solutions	Systems and System Models	