A Correlation of

Pearson
Oregon High School Science Program
Biology, Chemistry, Physics, and Earth Science
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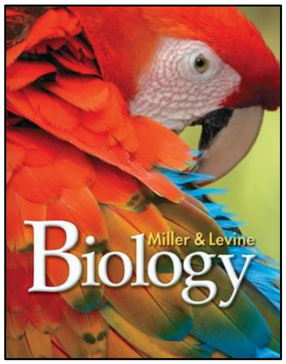

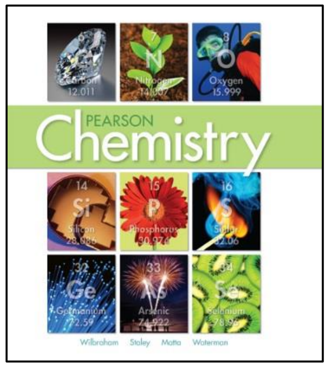

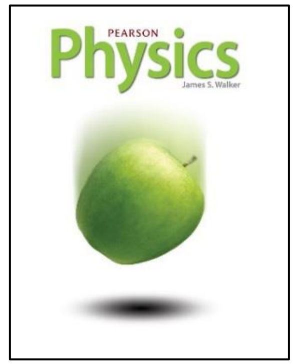

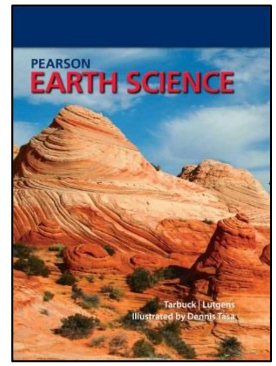

To the

Oregon Instructional Materials Evaluation Tool (OR-IMET)
for Alignment in Science
Grades 9-12

Pearson

IMET, OREGON SCIENCE GRADES 9–12
Miller Levine Biology
Pearson Chemistry
Pearson Physics
Pearson Earth Science

SECTION I: Alignment to the 2014 Oregon Science Standards

Criterion 1: FOCUS
Materials focus on in-depth learning of the NGSS disciplinary core ideas while engaging students in the scientific and engineering practices and connecting to crosscutting concepts in the context of authentic and content-appropriate science, and facilitate students developing a deeper understanding and application of scientific knowledge and the ability to think and reason scientifically while investigating complex ideas and solving problems.

Pearson has long-standing relationships with contributors and authors who have been involved with the development and review of the Next Generation Science Frameworks and the subsequent Next Generation Science Standards. As such, the spirit and pedagogical approach of the NGSS initiative is present in all programs. Throughout each program students make connections to concepts that cross disciplines, practice science and engineering skills, and build on their foundational knowledge of the disciplinary core ideas as they investigate complex ideas and solve problems.

Miller & Levine Biology

Miller & Levine Biology is fully aligned to the NGSS. As in *Physics*, the program features extensive support for all three dimensions of the NGSS in both student and teacher materials. The Teacher Edition includes a **Teacher Guide** before each chapter which "Spotlights" a core idea, a practice, and a crosscutting concept addressed in the chapter, and provides a "Building Scientific Literacy" feature that suggests ways to incorporate them into instruction. Further suggestions are provided in the "Chapter Planner."

In the Student Edition, each unit begins by presenting a **Problem-Based Learning Activity**. These activities engage students in fully three-dimensional learning by integrating multiple practices with a "Spotlighted" core idea and crosscutting concept over the course of the unit. Each chapter within a unit begins with a **Building Scientific Literacy** feature that highlights connections to the NGSS and a **Chapter Mystery** that engages student thought and curiosity. **Quick Labs**, **Visual Analogies**, and **Analyzing Data** provide further opportunities for students to engage in the practices through modeling and inquiry, while **Biology&...** features challenge students to make thoughtful connections between core ideas and technology, history, careers, and society.

Online materials for *Miller & Levine Biology* include **Chapter Labs** and **Virtual Labs**, which provide additional opportunities for students to deepen their understanding through the practices, and **STEM Activities** for each chapter that present students with a research or design challenge. **Interactive Art** simulations and animated **Visual Analogies** use modeling to enhance student understanding of the core ideas, while **Untamed Science Videos** provide real-world context.

Pearson Chemistry

The *Pearson Chemistry* program is designed with the same pedagogical approach as the NGSS. The text is aligned to the NSES and correlations to the NGSS are available online. The core ideas, practices, and crosscutting concepts are integrated throughout program materials. The following student-centered activities give a sampling of what is available:

Chapter Mysteries (CHEMysteries) present students with a problem or puzzle related to the chapter's Big Idea. Students use the core ideas and crosscutting concepts such as Cause and Effect to solve a mystery and explain a phenomenon. **Quick Labs** and **Small-scale Labs** provide students with hands-on opportunities to engage in science practices while developing their understanding of the core ideas, and **Interpret Graphs** and **Interpret Data** provide further opportunities for students to develop these skills. **Chemistry&You** features contextualize ideas and concepts in real-world situations, challenging students to extend their understanding through research and application. Likewise, **21st Century Learning** engages students in projects or challenges that draw on many of the practices and crosscutting concepts.

Pearson Chemistry enhances student learning through the PearsonChem digital platform, where students can develop the practices through **Virtual Labs** and **Kinetic Art** or extend their understanding of the core ideas in a real-world context through **Concepts in Action** and **Untamed Science Videos**.

Pearson Physics

Pearson Physics features extensive support for all three dimensions of the NGSS in both student and teacher materials. The Teacher Edition includes a **Teacher Guide** before each chapter which “Spotlights” a core idea, a practice, and a crosscutting concept addressed in the chapter, and provides a “Building Scientific Literacy” feature that suggests ways to incorporate them into instruction. Further suggestions are provided in the “Chapter Planner.” Each chapter's instructional material begins with an **Inquiry Lab** that engages students with a simple demonstration modeling a central concept or core idea, followed by questions that encourage them to construct explanations or analyze patterns to make predictions. The text makes extensive use of **Examples** and analogies to deepen understanding, develop skills, and connect concepts. **Physics&You** features contextualize ideas and concepts into real-world situations, and challenge students to extend their understanding through research and application. Each chapter closes with a **Physics Lab** in which students apply the practices to investigate and understand phenomena.

In addition to print resources, *Pearson Physics* features the MasteringPhysics online interface. This platform provides digital resources to enhance student understanding and facilitate engagement with the practices, such as **Demonstration Videos** and **ActivPhysics** interactive simulations.

Pearson Earth Science

Pearson Earth Science features are similar to the above programs, including **Try It!** inquiries that engage students at the beginning of each chapter through simple hands-on demonstrations or activities, in-depth **Exploration Labs** at the end of each chapter, and **21st Century Learning** features that engage students in projects or challenges that draw on many of the practices and crosscutting concepts. Unique to *Earth Science* are **Map It!** activities that require students to actively analyze some of the maps used throughout the program and to connect their interpretations to concepts and explanations presented in the text.

Criterion 1 Quality Indicators	Specific Evidence from Materials
1a. In each 9-12 grade level, both student and educator materials, when used as designed, provide opportunities to develop and use specific elements of the practice(s) to make sense of phenomena and to design solutions to problems. *The Framework for K12 Science Education (NRC 2012): pp. 41 – 48 and the Science and Engineering Practices progressions identified in Appendix F.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	See the following pages for examples: *Biology*: SE/TE page 299 (Checking Your Scientific Literacy) SEP.HS.2: Developing and Using Models *Chemistry*: SE/TE page 254 SEP.HS.3: Planning and Carrying Out Investigations *Physics*: SE/TE page 258 SEP.HS.5: Using Mathematics and Computational Thinking *Earth Science*: TE page 167 (Build Science Skills) SEP.HS.3: Planning and Carrying Out Investigations

Criterion 1 Quality Indicators	**Specific Evidence from Materials**
1b. In each 9-12 grade level, both student and educator materials, when used as designed, provide opportunities to develop and use specific elements of the crosscutting concept(s) to make sense of phenomena and to design solutions to problems. *The Framework for K12 Science Education (NRC 2012): pp. 84 – 101 and the Crosscutting Concepts progressions identified in Appendix G.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* ***Choose different performance expectations than previously reviewed.*	See the following pages for examples: *Biology*: Chapter 9 STEM Activity, "Cellular Respiration and Energy" CCC.HS.5: Energy and Matter, CCC.HS.6: Structure and Function *Chemistry*: SE/TE pages 593, 641 (CHEMystery); Kinetic Art 18.1, "Collision Theory" CCC.HS.2: Cause and Effect, CCC.HS.7: Stability and Change *Earth Science*: TE page 330 (21^{st} Century Learning); SE/TE page 271 (Exercise #6) CCC.HS.7: Stability and Change
1c. In each 9-12 grade level, both student and educator materials, when used as designed, provide opportunities to develop and use specific elements of the disciplinary core idea(s) to make sense of phenomena and to design solutions to problems. *The Framework for K12 Science Education (NRC 2012:) pp. 103 – 214 and the Disciplinary Core Ideas progressions identified in Appendix E.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* ***Choose different performance expectations than previously reviewed.*	See the following pages for examples: *Biology*: Chapter 22 STEM Activity, "Fruits as Models for Containers" DCI.HS-PS2.A: Forces and Motion, DCI.HS-ETS1.A: Defining and Delimiting an Engineering Problem, DCI.HS-ETS1.C: Optimizing the Design Solution *Chemistry*: TE page 845 (Explore) DCI.HS-LS1.C: Organization for Matter and Energy Flow in Organisms *Physics*: SE/TE page 696; ActivPhysics 11.1, "Electric Force: Coulomb's Law" DCI.HS-PS2.B: Types of Interactions

Criterion 1 Quality Indicators	Specific Evidence from Materials
1d. In each 9-12 grade level, in student and educator materials, when used as designed the three-dimensions work together to support students to make sense of phenomena and to design solutions to problems. *The Framework for K12 Science Education (NRC 2012): pp. 217 – 240.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	See the following pages for examples: *Chemistry*: TE pages 212 (Connect to Engineering); 213 (Performance Task); 434 (Connect to Technology) HS-PS2-6: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. (DCI.HS-PS1.A; SEP.HS.8; CCC.HS.6) *Physics*: SE/TE page 842 HS-PS2-5: Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current. (DCI.HS-PS2.B; SEP.HS.4; CCC.HS.3) *Earth Science*: TE page 696 (Performance-Based Assessment) HS-ESS2-4: Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (DCI.HS-ESS1.B; SEP.HS.2; CCC.HS.4)

Criterion 2: RIGOR
Materials support and guide in-depth instruction in the three intertwined NGSS dimensions, support the integration of conceptual understanding linked to explanations and empirical investigations that allow students to evaluate knowledge claims and develop procedural skills while engaging in authentic and content-appropriate scientific inquiry and engineering design learning experiences, and provide opportunities for students to engage in practice, discourse, and reflection in multiple interconnected and social contexts.* *The three intertwined NGSS dimensions refer to the Disciplinary Core Ideas, Crosscutting Concepts, and Science and Engineering Practices.

In Pearson's high school science programs, authentic and rigorous inquiry is a central facet of developing student understanding of the core ideas. Although the precise names of the labs and activities vary from program to program, the overall architecture of building understanding through inquiry and connecting concepts is consistent. Each chapter begins with a **Chapter Mystery** or **Lab** activity that presents a central concept from the chapter as a subject of inquiry. Within the chapter itself, **Quick Labs** and **Demonstrations** provide further experiential learning opportunities while analogies and examples direct student attention to their own experiences of science and technology outside the classroom. Each chapter closes with a longer lab that requires the application of several practices to develop or enhance the student's understanding of a core idea or concept. *Chemistry*'s end-of-chapter **Small-scale Labs** have an additional component, “You're the Chemist,” in which students design and carry out their own experiments. Further opportunities for inquiry are included in **Performance-Based Assessments** and Teacher Edition features such as “Build Science Skills.”

These programs also support the development of the student's understanding of the designed world through activities in which students actively define and solve problems through the engineering practices and the application of the core ideas and crosscutting concepts. For example, in *Chemistry* students apply their understanding of pH and other abiotic factors to design a garden suited to their local soil; in a *Pearson Physics* **STEM Activity**, students use principles of energy transfer and transformation to design, build, test, and refine a solar oven for use in situations with limited electrical or fuel access. Many of the **Problem-Based Learning Activities** in the *Biology* program involve designing solutions, from exercise plans to green roofs, and each chapter has an associated **STEM activity** available online.

Across the programs, students have ample opportunities to communicate their findings and engage in evidence-based argument and critique. **21st Century Learning** activities, for example, provide frequent opportunities to address these practices in *Chemistry* and *Earth Science*. In each program, features such as **Physics&You** and **Chemistry&You** engage students in research, evaluation, synthesis, and presentation of science concepts and technological applications, and in approaching controversies involving science or technology with well-reasoned arguments founded in a solid understanding of the core ideas and crosscutting concepts.

Criterion 2 Quality Indicators	**Specific Evidence from Materials**
2a. Materials support the development of students' conceptual understanding of the natural world through experiential investigations by providing three-dimensional opportunities to fully engage and interpret scientific explanations. *The Framework for K12 Science Education (NRC 2012): pp. 41 – 53 and Appendix F.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE page 264 DCI.HS-LS1.C; SEP.HS.4; CCC.HS.2, CCC.HS.5 *Chemistry*: SE/TE page 887 DCI.HS-PS1.C; SEP.HS.2, SEP.HS.4; CCC.HS.4 *Physics*: SE/TE page 376 DCI.HS-PS3.B; SEP.HS.5; CCC.HS.5 *Earth Science*: SE/TE page 181 DCI.HS-ESS2.C; SEP.HS.2; CCC.HS.4
2b. Materials support the development of students' conceptual understanding of the designed world through authentic engineering practices to define and solve problems by providing three-dimensional opportunities to fully engage and apply scientific knowledge. *The Framework for K12 Science Education (NRC 2012): pp. 41 – 53, Appendix F and Appendix I.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE page 1036, "Hydroponics" DCI.HS-ETS1.C; DCI.HS-LS1.C; SEP.HS.1, SEP.HS.3; CCC.HS.5 *Chemistry*: TE page 663 (21st Century Learning) DCI.HS-ETS1.B; SEP.HS.1, SEP.HS.7; CCC.HS.6 *Physics*: SE/TE pages S3-S4, STEM Activity, "Solar Oven" DCI.HS-PS3.A; DCI.HS-ETS1.C; SEP.HS.6; CCC.HS.5 *Earth Science:* SE/TE page 731, STEM Activity "Space Weather Readiness" DCI.HS-ETS1.A; SEP.HS.1; CCC.2

Criterion 2 Quality Indicators	Specific Evidence from Materials
2c. Materials include authentic and content-appropriate practices for student-generated claims with scientific evidence to make sense of phenomena and engineering design through evaluating and developing procedural skills. *The Framework for K12 Science Education (NRC 2012): Appendix F and Appendix H.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE pages 187a–187b *Chemistry*: SE/TE page 717 *Physics*: SE/TE pages 969–970 *Earth Science*: TE pages 150–151
2d. Materials are designed so that educators and students spend sufficient time engaging in the science and engineering practices to better understand the nature and development of scientific knowledge in multiple interconnected and social contexts through student-generated discourse. *The Framework for K12 Science Education (NRC 2012): What it means to learn science pp. 251-255.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: TE page 354 (Performance Tasks); Chapter 24 Lab, “Plant Hormones and Leaves” *Chemistry*: TE page 502 (21st Century Learning); SE/TE pages 502–503 *Physics*: SE/TE pages 520–521 *Earth Science*: SE/TE page 552 (21st Century Learning)

Criterion 3 & 4: COHERENCE
Learning experiences form a coherent learning progression in which each K-5 student builds competencies in the performance expectations through actively engaging in Science and Engineering Practices and applying crosscutting concepts to continually build on and revise their knowledge and skills in disciplinary core ideas. Student opportunities are directly connected to the grade-level performance expectations to develop and use specific grade-appropriate elements of three-dimensional learning that are integrated to develop and support students' sense-making of phenomena and design solutions to problems.

Across the programs, instructional materials are arranged in a careful sequence that integrates activities involving the three NGSS dimensions to build student competency by relating new material to previously taught core ideas, practices, and crosscutting concepts. To maintain a coherent learning progression, each chapter opens with a Big Idea, typically in the form of a question, and lessons within the chapter are oriented toward Key Questions or learn Key Concepts that cumulatively lead the student toward answering the question posed at the beginning of the chapter. At a larger scale, core ideas develop in complexity and sophistication between chapters and over the course of a year-long program, as exemplified by each progression described below.

The *Miller & Levine Biology* program's progression in addressing the Life Science disciplinary core idea of Structure and Function begins with an overview of structure, function, and homeostasis in individual cells, emphasizing general concepts such as the difference between prokaryotic and eukaryotic cells, the similarities and differences between plant and animal cells, and the hierarchical organization of cells into systems that maintain homeostasis at all levels. Students develop their skill in modeling through a **Quick Lab** ("Making a Model of a Cell") and by creating a flowchart showing the steps in protein assembly in response to an **In Your Notebook** prompt. They also develop their quantitative skills with an **Analyzing Data** feature ("Mitochondria Distribution in the Mouse").

In later chapters, students focus their inquiry on particular instances of structure and function in multicellular organisms. In one example from Chapter 23, they address the structures and adaptations of leaves in the context of a plant's need to regulate transpiration in order to maintain homeostasis. The **Quick Lab** "Examining Stomata" challenges them to collect and analyze data about the number of stomata on different types of leaves, and then to develop a hypothesis that would explain their observations. This knowledge of different tissues and systems is brought together in Chapter 28 with an examination of how all body systems work together to maintain homeostasis for the whole organism, and a summative **Performance Task** in which students develop a website that uses both text and illustrations to communicate information about a specific animal's body systems and maintenance of homeostasis.

When chemical reactions are first introduced in *Pearson Chemistry*, program materials focus on a broad understanding of the mechanisms of different types of reactions, modeling reactions with balanced equations, and the observation of patterns in reactants. As students progress to the study of stoichiometry, they refine their theoretical understanding of chemical reactions with practical considerations such as limiting reagents and percentage yield. This section provides an opportunity for students to integrate and apply data analysis, computational thinking, and the crosscutting concept of energy and matter. Finally, students use system models to understand the principles of establishing and changing equilibrium, and discuss its application in the design of industrial processes.

Understanding and designing systems requires a strong foundation in forces and motion. In *Pearson Physics*, after reviewing basic concepts such as velocity and acceleration, students begin the study of Newtonian mechanics. Chapter 5 begins with an **Inquiry Lab** that engages students in a demonstration of action and reaction forces before moving on to formal definitions of Newton's Laws. **Conceptual** and **Guided Examples** throughout the text further develop these concepts along with students' mathematical thinking and modeling skills. Chapters 6, 7, and 8 introduce the concepts of Work and Energy, Linear Momentum and Collisions, and Rotational Motion and Equilibrium through text, examples, and increasingly challenging labs. With these concepts solidly in place, students are able to apply them to understanding the more challenging concepts of circular motion and centripetal force. Chapter 9, and the section on classical mechanics, ends with a **Physics Lab** in which students collect and analyze data to construct an explanation of the relationship between centripetal force and mass. Finally, students synthesize their knowledge about how forces affect motion to analyze the design of a bicycle as a system of simple machine in a **STEM Activity**.

Pearson Earth Science follows a similar structure of increasing complexity from concepts to application. The central role of energy from the sun in driving Earth's weather and climate is first presented in the context of the basic thermodynamic cycles and flows relating Earth's systems and features. In the **Exploration Lab** “Heating Land and Water,” students develop their understanding of these foundational ideas through modeling and analyzing the effect of solar energy on different Earth surfaces. At the end of the section on weather and climate, students must use system modeling and engage in argument from evidence to answer a compelling question: “Write an article that explains at least three effects that an increase in Earth's surface temperature might have on the climate of your area.”

The Biology and Physics programs provide direct links to grade-level performance expectations, many of which can be usefully “bundled” to enhance the development of ideas, practices, and crosscutting concepts. An example of one such “bundling” opportunity from *Biology* is found with Performance Expectations HS-ETS1-1 and HS-ETS1-3, both of which involve understanding complex real-world problems in the context of criteria and constraints. The Chapter 17 **STEM Activity** entails designing a farm that minimizes problems from pollen drift; this practice in ecological design naturally leads to and supports students in completing the Unit 6 **Problem-based Learning Activity**, “A Living Roof.” Similarly, *Physics* shows how Kepler's laws describing the motion of objects in motion follow logically from Newton's Law of Gravity.

Criterion 3 & 4 Quality Indicators	Specific Evidence from Materials
3a. Materials provide strong integration of science and engineering practices, disciplinary core ideas, and crosscutting concepts **within each and across grade levels**. *The Framework for K12 Science Education (NRC 2012): Appendix E, Appendix F and Appendix G.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Chemistry*: SE/TE pages 374, 399, 612–615 DCI-HS-PS1.B *Earth Science*: SE/TE pages 483–487, 496–497, 610 (Writing in Science) DCI-HS-ESS2.D
3b&c. Materials **within each unit and course** provide coherent learning experiences that help students develop proficiency on a targeted set of three-dimensional performance expectations by intentionally linking prior knowledge and skills as a basis of engagement. *The Framework for K12 Science Education (NRC 2012): Appendix E, Appendix F and Appendix G.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE pages 571a–571b; Chapter 17 STEM Activity, "Pollination or Contamination?" HS-ETS1-1, HS-ETS1-3 *Physics*: SE/TE pages 307–312, 328–330 HS-PS2-4, HS-ESS1-4

Criterion 3 & 4 Quality Indicators	Specific Evidence from Materials
3d. Materials **within each unit and course** focus on the application of authentic and content-appropriate knowledge, skills, and reasoning. *The Framework for K12 Science Education (NRC 2012): Appendix E, Appendix F and Appendix G.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE pages 727a–727b, Problem-Based Learning, "Biomimicry" *Chemistry:* SE/TE page 909, STEM Activity, "Producing Sulfuric Acid" *Physics*: SE/TE pages S5-S6, STEM Activity, "Seismic Mapping" *Earth Science:* SE/TE page 728, STEM Activity, "The Bycatch Problem"
4. Materials are directly connected to the appropriate grade-level performance expectations to develop and use specific science and engineering practices, disciplinary core ideas, and crosscutting concepts that are integrated to develop and support students' sense-making of phenomena and design solutions to problems. *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *Next Generation Science Standards: 9-12 Evidence Statements.*	*Biology*: SE/TE pages 859a–859b, Problem-based Learning, "Body Mechanics" HS-ETS1-3 *Chemistry:* SE/TE page 906, STEM Activity, "Periodic Patterns" HS-PS1-1 *Physics*: SE/TE pages S1-S2, STEM Activity, "Skateboarding and Newton's Second Law of Motion" HS-PS2-1 *Earth Science*: page 729, STEM Activity, "Design to Reduce Waste" HS-ESS3-4

Criterion 6 & 7: COHERENCE
The interdependence and the influence of science, engineering and technology on society and the natural world along with the understanding of the nature of science are interconnected to the content being addressed.

Each program includes numerous full-page "Science&…" features (e.g., **Technology&Biology**, **Chemistry&You**, **Physics&You: Technology**) that make explicit connections between the core ideas, crosscutting concepts, and real-world applications of science, engineering, and technology in society and the natural world. For example, the **Physics&You** feature "X-ray Diffraction" connects the core idea of wave properties to the real-world problem of understanding structure and function at the submicroscopic level, and to the resulting technology's applications in biochemistry and nanoengineering. Likewise, the performance expectations are integrated into content and related to real-world applications within society. For example, the *Biology* **STEM Activity** "Malaria and Fungi" challenges students to design a mosquito net enhanced with fungal spores, working within the constraints of effective use and WHO/CDC standards.

Materials also integrate understandings about the nature of science and the relationship between science, technology, and society with the concepts and core ideas. For example, in the **Physics&You** feature "Atmospheric Modeling and Weather Prediction," the concepts of modeling and the scientific understanding of consistency in natural systems are addressed in the context of atmospheric science and the influence of science and technology on each other and society.

Numerous learning experiences involve students developing and extending their understanding of the nature of science and how to think scientifically. Each program includes a lesson or lessons near the beginning of the program which explicitly describes the nature of science and scientific habits of mind; *Chemistry's* "Introduction to Chemistry" chapter provides a typical example. The discussion of Wegener and the "continental drift" hypothesis in *Earth Science* serves as an extended example of the fundamental principle that scientific explanations must be based on evidence, with **Lesson Assessment** questions that require students to understand both the evidence in favor of this explanation and the reasons that ultimately led to its rejection. In the **Biology&Society** feature "Should Antibiotic Use Be Restricted?", students are challenged to think not only scientifically, but also as responsible citizens; they must recognize and address an ethical question that the core science idea of natural selection can inform, but cannot answer.

Criterion 6 & 7 Quality Indicators	Specific Evidence from Materials
6a. Materials integrate the **interdependence** of science, engineering, and technology as significant elements in learning experiences. *The Framework for K12 Science Education (NRC 2012): pp. 203, 210-212 and Appendix J.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Physics*: SE/TE pages 338–339 (Exercises #95–103, 112; HS-ESS1-4); 880 (Writing About Science, HS-PS4-5) *Earth Science*: SE/TE page 730 (STEM Activity, "Plate Tectonics: Measuring Plate Movement", HS-ESS1-5)
6b. Materials demonstrate the **influence** of engineering, technology, and science on society and the natural world as significant elements in learning experiences. *The Framework for K12 Science Education (NRC 2012): pp. 203, 210-212 and Appendix J.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Physics*: SE/TE pages 665 (HS-PS4-5) *Chemistry*: SE/TE pages 52 (21st Century Learning; HS-ETS1-3) *Biology*: SE/TE pages 153, 183, (Chapter Mystery; HS-ESS3-1); Chapter 21 STEM Activity, "Malaria and Fungi" (HS-ETS1-1) *Earth Science*: 107 (Exercises #1, 4; HS-ESS3-2); SE/TE page 472 (Performance-Based Assessment; HS-ESS3-4)
7. Materials integrate understandings about the nature of science as significant elements in learning experiences. *The Framework for K12 Science Education (NRC 2012): Appendix H.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE page 493 *Chemistry*: SE/TE pages 14–19 *Physics*: SE/TE page 35 *Earth Science*: SE/TE pages 248–253

Criterion 5, 8 & 9: COHERENCE
Instructional sequence provides multiple approaches to achieve proficiency of the performance expectations and a logical progression of diverse instructional strategies for student learning.

Pearson's high school science materials are designed with multiple and inclusive approaches to facilitate the success of all students. **Differentiated Instruction** is a regular point-of-use feature in the Teacher Editions, and provides modifications and extensions for students at all levels, including less-proficient readers, struggling students, and gifted or advanced students. Extensive support is also provided for English Language Learners at all levels of proficiency, both in Differentiated Instruction and specific **Focus on ELL** features.

In addition to providing instructional supports for a wide range of students, materials are deliberately designed to be inclusive and supportive for non-dominant student groups such as students with disabilities, students from different cultural backgrounds, and (in the case of the sciences) girls. In addition to commonsense steps like ensuring that illustrations and examples include diverse representations of culture, race, ability, and gender, Pearson materials provide both implicit and explicit support for inclusion. An example of implicit support is the **Physics&You** feature "X-ray Diffraction," which by featuring Nobel-winning biochemist Ada Yonath "[promotes] images of successful females in science" as recommended by Appendix D of the *NRC Framework*. Explicit support is demonstrated in a **Differentiated Instruction** example from *Pearson Physics*, in which teachers are reminded that students from other cultural backgrounds may not be familiar with the sports-related examples of collisions, and to re-frame their examples with culturally-familiar sports to ensure inclusion.

The materials also provide learning activities that support diverse learning styles with multiple opportunities for students to practice skills and develop understandings. Each program features unique activities developed to facilitate student success with domain-specific content. For example, *Physics* uses four distinct type of **Examples** (Guided, Active, Conceptual, and Quick) developed to support different learning styles and paces. *Pearson Chemistry* uses **Teacher Demos** and **Student Activities** to support the experiential learning and model-building that helps many students understand structure and interactions at the atomic scale. *Biology* uses numerous **Visual Analogies** to help students understand complex systems and concepts through familiar processes or ideas. *Earth Science* has an especially strong emphasis on cross-curriculum development and interdisciplinary learning with **Build Skills** and **Integrate** features on most pages of the Teacher Edition.

The Teacher Edition materials use either the Plan, Teach, Assess and Remediate model (*Physics*, *Biology*), the Engage, Explain, Explore, Extend, Evaluate model (*Chemistry*) or the Focus, Instruct, Assess model (*Earth Science*). Regardless of the instructional model used, the pacing and presentation is appropriate to the ideas, practices, and concepts being presented, with clear links to prior knowledge when appropriate. For example, in *Miller & Levine Biology*'s presentation of the evidence supporting the theory of evolution, each piece of reasoning and evidence is presented step-by-step in a logical order with a thorough discussion of how it contributes to the larger understanding. *Pearson Physics* presents the simpler concept of power at a faster pace while still maintaining logical order, supporting examples, and pauses to check understanding and integrate new ideas through inline **Practice Problems**.

Criterion 5, 8 & 9 Quality Indicators	Specific Evidence from Materials
5. Materials provide learning opportunities that include instructional strategies to facilitate three-dimensional learning. *The Framework for K12 Science Education (NRC 2012): Appendix D with the Case Studies and Appendix K.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: TE page 295 (Use Visuals/Differentiated Instruction) *Chemistry*: TE page 242 (Differentiated Instruction) *Physics*: TE page 237 (Differentiated Instruction); SE/TE page 665 *Earth Science*: TE page 309 (Differentiated Instruction)
8. Instructional sequence consistently provides multiple opportunities and adequate time for student learning. *The Framework for K12 Science Education (NRC 2012): Appendix E.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: For each chapter, the Teacher's Edition provides an NGSS Planning Guide that lists the multiple learning opportunities available. At the end of each chapter, NGSS Smart Guide pages summarize the Inquiry Assets and digital assets teachers and students can use to reinforce learning of the chapter content. For examples, please see TE pages 448a-448b and SE/TE pages 474-475. *Chemistry*: The Teacher's Edition provides a Planning Guide for each chapter that lists the multiple print and learning opportunities available. For example, please see TE pages 157A-157B. *Physics*: The Teacher's Edition provides a NGSS Planning Guide and Pacing Guide that list the multiple learning opportunities available for each chapter. For example, please see TE pages 188A-188B. *Earth Science*: In addition to an overall Pacing Guide the Teacher's Edition provides Planning Guide and a Pacing Guide that list the multiple learning opportunities available for each chapter. For example, please see TE pages 246A-246B.

Criterion 5, 8 & 9 Quality Indicators	**Specific Evidence from Materials**
9a. Materials use diverse instructional strategies that provide clear purposes for learning experiences (e.g., elicit preconceptions, teach new knowledge, build skills and abilities, and connects to prior knowledge). *The Framework for K12 Science Education (NRC 2012): Appendix A and Appendix D with the Case Studies.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: SE/TE page 785 (Visual Analogy) *Chemistry*: TE page 129 (Teacher Demo) *Physics*: SE/TE pages 402–404 (Examples) *Earth Science*: TE pages 189–192 (Build Skills, Integrate...)
9b. Materials use instructional strategies in a logical progression that provides clear purposes for learning experiences (e.g., elicit preconceptions, teach new knowledge, build skills and abilities, and connect to prior knowledge). *The Framework for K12 Science Education (NRC 2012): Appendix D with the Case Studies.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.*	*Biology*: TE pages 286–290 (Teach, Assess and Remediate) *Chemistry*: TE pages 226–238 (Engage, Explain, Explore, Extend, Evaluate) *Physics*: TE page 674B (Plan) *Earth Science*: TE pages 7–10 (Focus, Instruct, Assess)

Criterion 3 & 10: COHERENCE
Materials support and guide in-depth instruction in the three intertwined NGSS dimensions, with relevant and clear connections to multiple science disciplines, the Common Core State Standards (CCSS) in Mathematics, English Language Arts & Literacy, and the Oregon English Language Proficiency Standards.

The Pearson high school programs demonstrate clear connections among multiple disciplinary core ideas and cross-cutting concepts in the explanation of phenomena. For example, the ideas of "Conservation of Energy and Energy Transfer," "Energy in Chemical Processes and Everyday Life," and "The Role of Water in Earth's Surface Processes," and concepts of "Systems and System Models" and "Energy and Matter" are connected in a constellation that regularly appears in whole or in part across the programs. In Physics, the context is thermodynamics and the transfer of heat. In Chemistry, the context is thermochemistry and specific heat. In Biology, the focus shifts to the transformations and transfer of energy within ecosystems, and in Earth Science the focus is on weather and climate.

Students are provided with frequent opportunities to develop their skills in intersecting Mathematical Practices and English Language Capacities at a range of complexity levels. For example, in the **Physics&You** feature "Cryogenics" students "Obtain, synthesize, and report findings clearly and effectively" (E.3), while in the *Earth Science* feature **21st Century Learning** students are required not only to obtain and communicate information, but also to "Construct viable arguments…" (MP.3, E.4) while "Reading, writing, and speaking grounded in evidence" (E.5). The *Pearson Chemistry* **Performance Task** "Naturally Impulsive" is one of many examples that use mathematical modeling to describe scientific concepts or processes, and every **Problem-based Learning Activity** from the *Biology* program requires students to produce a final project or presentation.

Pearson Physics and *Miller & Levine Biology* provide grade-appropriate connections and correlations to the Common Core State Standards for Math and English Language Arts & Literacy. These correlations can be found in the **Chapter Planners** of the Teacher Edition for each program, as well as in the front matter and online. In addition, *Biology* calls out Common Core connections with an icon at the point-of-use in both the Student Edition and the Teacher Edition.

The *Pearson Chemistry* and *Pearson Earth Science* programs are similarly rich with opportunities to make connections with the CCSS-M and CCSS-ELA. For example, in *Chemistry,* the cited discussion and sample problem for rate laws correlates strongly to F-IF.B.4 and F-IF.B.6. In *Earth Science*, the "Writing in Science" exercise cited in criterion 10b below correlates to WHST.9-10.1 and WHST.9-10.4.

The programs also provide extensive point-of-use leveled ELL support which emphasizes the development of speaking, listening, and writing skills through contextualized and content-focused activities and scaffolds.

Criterion 3 & 10 Quality Indicators	Specific Evidence from Materials
3e. Materials **across and throughout grades 9-12** build coherent learning progressions by integrating science and engineering practices, disciplinary core ideas, and crosscutting concepts. *The Framework for K12 Science Education (NRC 2012): pp. 33-34, Chapter 5-8 and Appendix E.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *9-12 NGSS grade-level standards: Connections to other disciplinary core ideas at the grade band and Articulation of disciplinary core ideas across grade band.*	*Biology*: SE/TE pages 197–217, 680–684, 827–832 DCI.HS-LS1.A *Physics*: SE/TE pages 151–160, 320–326, 334 DCI.HS-PS2.A
3f. Where appropriate, materials **across and throughout grades 9-12** provide multiple disciplinary core ideas and cross-cutting concepts that are used together to explain phenomena. *The Framework for K12 Science Education (NRC 2012): Appendix E, Appendix F and Appendix G.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *9-12 NGSS grade-level standards: Connections to other disciplinary core ideas at the grade band and Articulation of disciplinary core ideas across grade band.*	*Biology*: SE/TE pages 69–78 DCI.HS-PS3.D, DCI.HS-LS1.C, DCI.HS-LS2.B; CCC.HS.4, CCC.HS.5 *Chemistry*: SE/TE pages 556–561 DCI.HS-PS1.B, DCI.HS-PS3.B, DCI.HS-ESS2.C; CCC.HS.4, CCC.HS.5 *Physics*: SE/TE pages 350–365, 397–399 DCI.HS-PS3.B, DCI.HS-PS4.B, DCI.HS-ESS2.C; CCC.HS.4, CCC.HS.5 *Earth Science*: SE/TE pages 483–493 DCI.HS-PS3.B, DCI.HS-PS4.B, DCI.HS-ESS2.C, DCI.HS-ESS2.D; CCC.HS.4, CCC.HS.5

Criterion 3 & 10 Quality Indicators	Specific Evidence from Materials
3g. Where appropriate, materials **across and throughout grades 9-12** include science and engineering practices that are integrated with other content area practices. *The Framework for K12 Science Education (NRC 2012): Appendix F* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *9-12 NGSS grade-level standards: Connection Boxes and the Commonalities Among Practices in Science, Mathematics, English Language Arts and English Language Proficiency (NSTA Venn and Understanding Language Venn Diagram).*	*Biology*: SE/TE pages 61a–61b SEP.HS.7; MP.3; E.2, E.4, E.5 *Chemistry*: TE page 636 (Performance Task) SEP.HS.2, SEP.HS.8; MP.4; E.3 *Physics*: SE/TE page 407 SEP.HS.8; E.3 *Earth Science*: TE page 470 (21st Century Learning) SEP.HS.2, SEP.HS.7, SEP.HS.8; MP.3; E.2, E.3, E.4, E.5
10a. Materials provide relevant grade-appropriate connection(s) to the Common Core State Standards (CCSS) in Mathematics. *The Framework for K12 Science Education (NRC 2012): Appendix L (pp. 27-35).* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *9-12 NGSS grade-level standards: Connection Boxes, Common Core State Standards-Mathematics.*	*Biology*: TE pages 632b (Teach); 633 (Building Scientific Literacy) *Chemistry*: TE pages 605–607 (Rate Laws, Foundations for Math, Reaction Mechanisms) *Physics*: TE page 414B (Teach) *Earth Science*: TE page 15 (Integrate Math); SE/TE pages 118–119 (Inquiry Exploration Lab)

Criterion 3 & 10 Quality Indicators	Specific Evidence from Materials
10b. Materials provide relevant grade-appropriate connection(s) to the Common Core State Standards (CCSS) in English Language Arts & Literacy. *The Framework for K12 Science Education (NRC 2012): Appendix M.* *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *9-12 NGSS grade-level standards: Connection Boxes, Common Core State Standards- English Language Arts (Science & Technical Subjects).*	*Biology*: SE/TE pages 95 (Building Scientific Literacy); 123–127 (Exercises #11, 13, 19, 25, 33, 37–38; Chapter Mystery; Analyzing Data) *Chemistry*: SE/TE page 217 (Write About Science) *Physics*: TE pages 342A–342B (Building Scientific Literacy, Teach) *Earth Science*: SE/TE page 184 (Writing in Science)
10c. Materials provide relevant grade-appropriate connection(s) to the Oregon English Language Proficiency Standards. *Next Generation Science Standards: For States, By States (NGSS Lead States 2013): 9-12 Performance Expectations.* *The Framework for English Language Proficiency Development Standards: pp. 26-30 and English Language Proficiency Standards: pp. 31- 34.*	*Biology*: TE pages 393, 422 (Focus on ELL) *Chemistry*: TE page 337 (Focus on ELL) *Physics*: TE page 533 (Differentiated Instruction) *Earth Science*: TE page 348 (Differentiated Instruction)

SECTION II: Instructional Supports
Supporting Criteria

II - INDICATORS OF QUALITY: Student Engagement	**Evidence**
11. Engages students in authentic and meaningful learning experiences that reflect real-world science and engineering practices in the NGSS performance expectations and are grounded in students' experiences to provide a context for making sense of phenomena and/or designing solutions to problems through the following indicators:	
a. The context of learning experiences, including relevant phenomena, questions, or problems, engages students in three-dimensional learning.	See the following pages as examples for each program: *Biology*: SE/TE pages 117–121 (Key Questions) *Chemistry*: SE/TE pages 188–189 (Exercises #64–66, 71–81) *Physics*: SE/TE page 217 *Earth Science*: SE/TE pages 606–607
b. Provides relevant firsthand experiences or models that allow students to make sense of the physical and natural world.	See the following pages as examples for each program: *Biology*: Chapter 22 Lab, "Exploring Plant Diversity" *Chemistry*: SE/TE page 787; Chapter 15.1 Kinetic Art, "Hydrogen Bonding" *Physics*: SE/TE page 218 *Earth Science*: SE/TE pages 692–693
c. Engages students in multiple practices that are integrated into relevant disciplinary core ideas and crosscutting concepts to support making sense of phenomena and designing solutions to problems through inquiry <u>and</u> engineering design experiences.	See the following pages as examples for each program: *Biology*: Chapter 4 STEM Activity, "Research Mutualism" *Chemistry*: SE/TE page 52 (21st Century Learning) *Physics*: SE/TE page 484 *Earth Science*: SE/TE page 500 (Performance-Based Assessment)

II - INDICATORS OF QUALITY: **Student Engagement**	**Evidence**
d. Provides opportunities for students to connect their explanation of a phenomenon and/or their design solution to a problem to their own experience.	See the following pages as examples for each program: *Biology*: SE/TE pages 1a–1b *Chemistry*: SE/TE page 700 *Physics*: SE/TE page 267 (Inquiry Lab) *Earth Science*: SE/TE pages 118–119
e. Provides relevant applications for students to relate science to life, home, school, and various careers, and to apply their knowledge and skills as scientifically literate citizens.	See the following pages as examples for each program: *Biology*: SE/TE page 934 *Chemistry*: SE/TE pages 532–533 *Physics*: SE/TE page 941 *Earth Science*: TE page 212 (21^{st} Century Learning)
12a. Facilitates deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts by building upon prior knowledge.	See the following pages as examples for each program: *Biology*: TE page 450 (Activate Prior Knowledge) *Chemistry*: TE page 436 (Activate Prior Knowledge) *Physics*: SE/TE page 243 (Connecting Ideas) *Earth Science*: TE pages 362D, 378 (Use Prior Knowledge)

II - INDICATORS OF QUALITY: **Student Engagement**	**Evidence**
12b. Facilitates deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts by identifying and correcting misconceptions.	See the following pages as examples for each program: *Biology*: TE page 456 (Address Misconceptions) *Chemistry*: TE page 383 (Introduce the Chapter) *Physics*: TE page 138 (Common Misconceptions) *Earth Science*: TE pages 246C–246D, 266 (Address Misconceptions)
13. Through scientific discourse in oral, visual, and/or written form, materials provide frequent opportunities for students to express, clarify, justify, interpret, represent their ideas, and respond to peer and teacher feedback.	See the following pages as examples for each program: *Biology*: SE/TE pages 435, 447a–447b *Chemistry*: TE page 397 (21st Century Learning) *Physics*: SE/TE page 141 *Earth Science*: TE page 388 (21st Century Learning)

SECTION II: Instructional Supports
Key Criteria

II - INDICATORS OF QUALITY: Differentiated Instruction	**Evidence**
14. Provides guidance for teachers to support differentiated and culturally responsive (i.e., purposefully represents diverse cultures, linguistic backgrounds, learning styles, and interests) instruction in the classroom so that every student's needs addressed by including:	
a. Suggestions for how to promote equitable instruction by making connections to culture, home, neighborhood, and community, as appropriate.	See the following pages as examples for each program: *Biology*: SE/TE 874 *Chemistry*: TE 285 (Focus on ELL) *Physics*: TE 368 (Real World) *Earth Science*: TE page 358 (21st Century Learning)
b. Appropriate scaffolding, Interventions, and supports, including integrated and appropriate reading, writing, listening, and speaking alternatives (e.g., translations, picture support, graphic organizers) that neither sacrifice science content nor avoid language development for English language learners, special needs, or below grade level readers.	See the following pages as examples for each program: *Biology*: TE pages 111–112 (Differentiated Instruction, Focus on ELL) *Chemistry*: TE pages 490–491 (Differentiated Instruction, Focus on ELL) *Physics*: TE page 348 (Differentiated Instruction); SE/TE page 470 (Reading Support) *Earth Science*: TE page 370 (Build Reading Literacy, Differentiated Instruction)

II - INDICATORS OF QUALITY: Differentiated Instruction	**Evidence**
c. Digital and print resources that provide various levels of readability (e.g., based on the CCSS three part model for measuring text complexity).	*Biology:* The digitally-available Foundations Edition of the text is written at a lower reading level and includes embedded reading support. *Chemistry:* The digitally-available Foundations Edition of the text is written at a lower reading level and includes embedded reading support. *Physics:* Reading Support margin features throughout the text address etymology and multiple meanings to reinforce understanding of scientific terms. *Earth Science:* The Earth Science program is on-level in readability and text complexity. To support reading skills, each lesson opens with a Vocabulary list and Reading Strategy. The Teacher's Edition includes Build Reading Literacy support for each chapter.
d. Modifications and extensions for all students, including those performing above their grade level, to develop deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts.	See the following pages as examples for each program: *Biology*: TE pages 280–285 (Differentiated Instruction) *Chemistry*: TE page 577 (Differentiated Instruction) *Physics*: TE pages 175, 202 (Differentiated Instruction) *Earth Science*: TE pages 430–431 (Differentiated Instruction)
e. Technology and digital media to support, extend, and enhance learning experiences.	Each program uses a variety of technology and digital media resources to extend and enhance learning, including virtual labs, video demonstrations, interactive simulations, and animated explanations. See digital interfaces for *Physics*, *Chemistry*, and *Biology*. See Virtual Earth Science Lab and GEODe CD-ROMs for *Earth Science*.

II - INDICATORS OF QUALITY: Differentiated Instruction	**Evidence**
f. Materials in multiple language formats.	The print and online Glossaries for each program contain full definitions in English and Spanish. Selected instructional materials from *Biology* and *Earth Science* are also available in Spanish.
15. Includes grade-level appropriate academic and content-specific vocabulary in the context of the learning experience that is accessible, introduced, reinforced, reviewed and augmented with visual representations when appropriate.	See the following pages as examples for each program: *Biology*: SE/TE pages 418–419 *Chemistry*: SE/TE pages 664–665 *Physics*: SE/TE pages 396–397 *Earth Science*: SE/TE pages 292–293

SECTION II: Instructional Supports
Supporting Criteria

II - INDICATORS OF QUALITY: **Extensions & Educator Supports**	**Evidence**
16. Provides guidance for teachers throughout the unit for how learning experiences build on each other to support students in developing deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts.	See the following pages as examples for each program: *Physics*: TE pages 452A–452B (Teacher Guide) *Chemistry*: TE page 727 (Teach for Understanding) *Biology*: TE pages 248a–249, 267 (Teacher Guide, Building Scientific Literacy) *Earth Science*: TE pages 92C–92D (Before You Teach)
17. Provides scaffolded supports for teachers to facilitate learning of the practices so that students are increasingly responsible for making sense of phenomena and/or designing solutions to problems.	In all four programs, each chapter begins with a short lab or Chapter Mystery to engage students in the process of making sense of a particular phenomenon and ends with a Chapter Lab that requires thoughtful application of the practices. Additional in-text labs, examples, and Lesson Checks, along with TE-only features such as “Build Science Skills,” provide scaffolded support as students build their competence in the practices. See the following representative chapter progression: *Physics*: SE/TE pages 73–76, 89–91, 98–99, 102–103

II - INDICATORS OF QUALITY: Extensions & Educator Supports	**Evidence**
18. Provide digital and print materials are consistently formatted, visually focused, and uncluttered for efficient use.	Materials are consistently formatted within each program and have strong similarities in layout across programs, leading to efficient use for both teachers and students. The layout of online materials mirrors that of print materials for further consistency across platforms. See the following pages as examples from each program: *Physics*: SE/TE pages 612–618 *Chemistry*: SE/TE pages 289–297 *Biology*: SE/TE pages 274–278 *Earth Science*: SE/TE pages 66–74
19. Provide virtual labs, simulations, and video-based learning experiences.	*Physics*, *Chemistry*, and *Biology* offer a wide range of virtual labs, simulations, interactive visuals, and video-based learning experiences at their respective digital interfaces. See: Physics: www.masteringphysics.com Chemistry: www.pearsonrealize.com Biology: www.pearsonrealize.com *Earth Science* includes the Virtual Earth Science Lab and GEODe CD-ROMs, which provide similar resources.
20. Allow teachers to access, revise, and print from digital sources (e.g., readings, labs, assessments, rubrics).	Teachers can access, edit, and print resources available at the digital interface for each program.
21. Supplies and equipment, when provided, are high quality (e.g., durable, dependable) and organized for efficient use.	Supplies and equipment for these programs are not provided.

II - INDICATORS OF QUALITY: **Extensions & Educator Supports**	**Evidence**
22. Provide thorough lists that identify by learning experience all consumable and non-consumable materials aligned for both instruction and assessment.	See Materials Lists: *Chemistry*: TE pages T19–T24, 382B *Biology*: TE pages T47–T48 *Earth Science*: TE pages T41–T43, 124B
23. Use scientifically accurate and grade-appropriate scientific information, vocabulary, phenomena, models, and representations to support students' three-dimensional learning.	All programs use scientifically accurate and grade-appropriate information, vocabulary, phenomena, and models. See the following examples: *Physics*: "Physics Refresher" at MasteringPhysics *Chemistry*: TE pages 594–603 (Engage, Explain, Explore, Extend) *Biology*: SE/TE pages 546–552 *Earth Science*: TE pages 334C–334D
24. Adhere to safety laws, rules, and regulations and emphasize the importance of safety in science.	Consistent safety icons and cautions are listed at the beginning of all applicable activities and reinforced at hazard points. For program-specific safety, see: *Physics*: SE/TE pages R72–R73 *Chemistry*: SE/TE pages R49–R50; Chapter 1 Virtual Lab, "Laboratory Safety" *Biology*: SE/TE pages A-11–A-13 *Earth Science*: SE/TE pages 732–733

II - INDICATORS OF QUALITY: **Extensions & Educator Supports**	**Evidence**
25. Make available ongoing and embedded professional development for implementation and continued use of the instructional materials.	See the following examples: *Physics*: A "Physics Refresher" professional development feature is available for each chapter in the Instructor Resources section of MasteringPhysics. *Chemistry*: TE pages 249–250 (Professional Development Notes) *Biology*: TE pages 97–103 (Biology In-Depth, How Science Works, Quick Facts) *Earth Science*: TE pages 392C–392D, 396–397 (Facts and Figures)

SECTION III: Monitoring Student Progress
Supporting Criteria

II - INDICATORS OF QUALITY: **Monitoring Student Progress**	**Evidence**
The instructional materials support monitoring student progress:	
26. Elicits direct, observable evidence of three-dimensional learning using practices with core ideas and crosscutting concepts to make sense of phenomena and/or to design solutions that have been covered adequately in the instructional materials.	Program materials elicit evidence of three-dimensional learning through a variety of Lab activities, Performance Tasks, Problem-based Learning Activities, and Performance-Based Assessments. *Physics*: SE/TE page 942 (Lab Activity) *Chemistry*: TE page 150 (Performance Task) *Biology*: SE/TE pages 571a–571b (Problem-based Learning) *Earth Science*: SE/TE page 418 (Performance-Based Assessment)

II - INDICATORS OF QUALITY: **Monitoring Student Progress**	**Evidence**
27. Includes editable and aligned rubrics, scoring guidelines, and exemplars that provide guidance for assessing student performance along all three NGSS dimensions to support teachers in (a) planning instruction and (b) providing ongoing feedback to students.	The Teacher Editions of *Physics*, *Chemistry*, and *Earth Science* include answer keys for all problems and sample answers or short guidelines for extended response questions and projects. For NGSS-aligned rubrics, see: *Biology*: SE/TE pages 446, 726
28. Uses varied modes (selected, constructed, project-based, extended response, and performance tasks) of instruction-embedded pre-, formative, summative, peer, and self-assessment measures of three-dimensional learning.	The following citations are representative of the varied modes of assessment in all four programs: *Chemistry*: SE/TE pages 344–345 (Chapter Opener), 352–353 (Sample Problems), 367 (Lesson Check), 374 (Small-Scale Lab), 375 (Performance Tasks), 377–380 (Assessment)
29. Provides multiple opportunities for students to demonstrate and receive feedback on performance of practices connected with their understanding of disciplinary core ideas and crosscutting concepts.	See the following activities: *Physics*: SE/TE page 408 (Lab Activity) *Chemistry*: TE page 584 (Performance Tasks) *Biology*: SE/TE pages 61a–61b (Problem-based Learning) *Earth Science*: TE page 442 (21st Century Learning)

II - INDICATORS OF QUALITY: **Monitoring Student Progress**	**Evidence**
30. Assesses student proficiency using methods, vocabulary, representations, models, and examples that are accessible and unbiased for all students.	See Lesson Check and Chapter Assessments: *Physics*: SE/TE pages 260–264 *Chemistry*: SE/TE pages 298–302, 524 *Biology*: SE/TE pages 412–414 *Earth Science*: SE/TE pages 303–304
31. Digital assessments are easy to manipulate and customize, are linked to Common Core State Standards, and have large problem banks.	For *Physics*, *Chemistry*, and *Biology*, teachers can use each program's online interface to assign included assessments as-written, edit them to fit their requirements, or upload their own. The programs offer a variety of methods for tracking student progress in relation to standards. *Earth Science* does not include an online interface, however digital assessments can be created using the associated ExamView question banks.
32. Digital assessment platform allows teachers to easily access student work and provide feedback.	Assessments and assignments for *Physics*, *Chemistry*, and *Biology* can be assigned online. Teachers can easily access student work. Students can complete assignments online and submit them digitally for review or, when appropriate, print them out.
33. Provides teachers with a range of data to inform instruction that can interface with multiple electronic grade book platforms.	Data is made available to teachers on the digital interfaces for *Physics*, *Chemistry*, and *Biology*. Teachers can easily view assignments and test scores to track student progress.
34. Provides print and digital assessments that are platform- and device-independent.	All programs include print assessments. Digital assessments for *Physics* are available at www.masteringphysics.com. Digital assessments for *Chemistry* and *Biology* are available at www.pearsonrealize.com. These websites are also available on mobile devices.