Myriad Sensors Conceptual Academy Physics

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Executive Summary

Section 1. Science-Related Texas Essential Knowledge and Skills (TEKS) and English Language Proficiency Standards (ELPS) Alignment

TEKS Student %	TEKS Teacher %	ELPS Student %	ELPS Teacher %
100%	100%	100%	100%

Section 2. Instructional Anchor

- The materials are somewhat designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.
- The materials anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

Section 3. Knowledge Coherence

- The materials are somewhat designed to build knowledge systematically, coherently, and accurately.
- The materials provide educative components to support teachers' content and coherence knowledge.

Section 4. Productive Struggle

- The materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

Section 5. Evidence-Based Reasoning and Communicating

- The materials promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.
- The materials provide some teacher guidance to support student reasoning and communication skills.

Section 6. Progress Monitoring

- The materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.
- The materials include some guidance that explains how to analyze and respond to data from assessment tools.
- The assessments are clear and easy to understand.

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Section 7. Supports for All Learners

- The materials provide guidance on fostering connections between home and school.
- The materials include listening, reading, writing, and speaking supports to help Emergent Bilinguals meet grade-level science content expectations.
- The materials include some research-based instructional methods that appeal to a variety of learning interests and needs.
- The materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

Section 8. Implementation Supports

- The materials include year-long plans with practice and review opportunities that support instruction.
- The materials include some classroom implementation support for teachers and administrators.
- The materials provide implementation guidance to meet variability in program design and scheduling.

Section 9. Design Features

- The visual design of materials is clear and easy to understand.
- The materials are intentionally designed to engage and support student learning with the integration of digital technology.
- The digital technology or online components are developmentally and grade-level appropriate and provide support for learning.

Section 10. Additional Information

- The publisher submitted the technology, price, professional learning, and additional language supports.

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Indicator 2.1

Materials are designed to strategically and systematically integrate scientific and engineering practices and course-level content as outlined in the TEKS.

1	Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices as outlined in the TEKS.	M
2	Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level or course as outlined in the TEKS.	M
3	Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations and to engage in problem-solving to develop an understanding of science concepts.	PM

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials integrate some scientific and engineering practices and course-level content as outlined in the TEKS.

Materials provide opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices as outlined in the TEKS. Materials develop some students' content knowledge and skills as appropriate for the concept and grade level or course as outlined in the TEKS. Materials include some opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations and to engage in problem-solving to develop an understanding of science concepts.

Evidence includes but is not limited to:

Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices as outlined in the TEKS.

- Materials provide students with opportunities to practice or show mastery of grade-level scientific and engineering practices. For example, Chapter 5, "Energy," provides students with opportunities for lab investigations or virtual simulations for sections like Work and Power, Mechanical Energy, and Potential Energy. Materials allow students to develop explanations and solutions by analyzing heat transfer between the body and liquid water, holding their fingers in cold and hot water. In their own words, students define heat, temperature, and thermal energy.
- Chapter 4 offers four phenomena sections, two sensor activities, and a PhET lab. The phenomena sections take a closer look at real-life phenomena and provide many questions and suggestions to lead a discussion on this phenomenon as it relates to the content. The sensor activities provide more hands-on activities to explore the topics. The PhET lab provides a quick way to use a simulator to reinforce these concepts. Within one chapter, seven activities are provided to give a varying level of investigative learning opportunities. The materials also offer a field journal to aid in collecting data.
- The "Handbook of Class Activities," located in the "About this Course Section," lists the individual activities provided in the materials for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices. For example, "Next-Time Questions" are used for the development of skills by having students first think through a problem with the

answer supplied by the teacher in the next class. Lesson-Level Phenomena are activities that ask students questions by introducing them to a phenomenon and guide students to describe the phenomena based on content knowledge. Writing activities allow students to show mastery of content by producing an authentic answer based on content knowledge.

Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level or course as outlined in the TEKS.

- On the landing page for the course, materials strategically and systematically develop students' content knowledge. For example, Chapter 11 investigates wave behavior and relates it to sound. Chapter 12 systematically adds content to the topic of waves by exploring light and color, beginning in 12.1 with the electromagnetic spectrum. By relating back to the previous unit, Chapter 12 builds systematically on content knowledge. Chapter 11 has individual activities related to the scientific and engineering practices (SEPs), such as 11.1 "Phenomenon."
- In Chapter 9, the materials strategically and systematically integrate the scientific and engineering practices (SEPs) with the concept of electricity. Materials first show students the underlying concept that electricity relies on two charges (9.1). Next, the material has students investigate the phenomena of lightning by using the SEPs. Next, the materials provide context and mathematical quantification of the force of electricity by investigating and calculating Coulomb's Law (9.2). Materials then provide context and calculation for the components of Ohm's Law in terms of circuitry (9.3–9.8). The materials allow for student investigation using SEPs to design circuits (9.7–9.8). Materials provide content and calculation for the uses of Ohm's Law (9.7–9.8).
- Strategic implementation of TEKS is found within the third column of the Lesson and Activity Pacing Guide. The lessons in the material contain an outline of some, but not all of the TEKS as they progress through the materials. The materials address appropriate concepts and grade-level knowledge as outlined in the TEKS. For example, Chapter 4.8 is presented in a strategic and systematic way. The sample chapter included in the materials provides students with many video and reading checks embedded in each section. Each chapter includes a "Concept Check" at the end to allow students to check their mastery.

Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations and to engage in problem-solving to develop an understanding of science concepts.

- Materials allow students to engage in problem solving where they can make connections and develop conceptual understanding. For example, in Lesson 3.4: "Tug of War," there is an activity where students stretch a rubber band between their fingers and thumb. Questions like "Which pulls stronger: Your finger or your thumb?" follow an opportunity for students to discuss why forces only occur in pairs.
- Chapter 4 offers four Phenomena sections, two sensor activities, and a PhET lab. In addition to all of these activities, which offer many opportunities for questions and investigating, the chapter also features five "next time questions," which pose a question and encourage group discussions to enhance the understanding of the topic, as well as promote problem-solving. The chapter presented many of these opportunities, but it did not offer any field investigations.
- In Chapter 9.1, "Phenomenon- Building Connections," materials for the teacher give students the opportunity to engage in problem-solving by asking the question, "Propose how this

problem can be solved using a lightning rod.” However, conducting an experiment or field investigation was not observed.

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Indicator 2.2

Materials anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

1	Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices and course-level content as outlined in the TEKS.	M
2	Materials intentionally leverage students' prior knowledge and experiences related to phenomena and engineering problems.	M
3	Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials anchor learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices and course-level content as outlined in the TEKS. Materials intentionally leverage students' prior knowledge and experiences related to phenomena and engineering problems. Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.

Evidence includes but is not limited to:

Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices and course-level content as outlined in the TEKS.

- In Chapter 5, the materials provide six in-depth looks at phenomena that relate to energy. All six of these looks provide a deeper connection to the topics that help build knowledge and mastery. The sections also provide a chance to work on and investigate the phenomena in a hands-on activity. Section 5.4 contains a "Try It and See (Your Turn)" section that gives instructions for students to explore a smaller-scale version of the phenomena. Section 5.3 contains a "Think About It (Your Turn)" section that encourages students to explore these phenomena further.
- In Chapter 7.2, the materials offer a Sensor Activity that gives an in-depth exploration of water pressure. The activity starts by relating common experiences, such as being in a pool and snorkeling, to the concepts of water pressure. The materials then present a series of guiding questions and a video on the topic. It then builds to a series of hands-on activities and a sensor activity where the student measures, collects, and graphs real data concerning water pressure.
- The materials relate phenomena to concepts being covered and to everyday experiences but do not relate them to engineering problems. Activities offer clear correlations between the concepts and goals and the phenomenon.

- In Chapter 11.1, “Phenomenon,” materials support students by exploring period motion. Materials provide authentic application by requiring students to use disciplinary knowledge in problem-solving. For example, materials ask students the question, “[h]ow can a pendulum be used to show the rotation of Earth?” Although there is one solution to the problem, the path to this solution is authentic.

Materials intentionally leverage students’ prior knowledge and experiences related to phenomena and engineering problems.

- Materials elicit and leverage students’ background knowledge and experience to adequately address potential areas of misunderstanding. For example, during Chapter 5, “Energy,” Lesson 5.1 intentionally asks students to reflect on previous experiences, like lifting weights, to connect with the concept of work. With this activity, students lay the foundational understanding of power when work is actually done.
- In Chapter 4.4, the materials discuss the phenomenon of bungee jumping. The materials relate the concepts being covered to prior knowledge and experiences of the learner. The materials leverage this knowledge as it relates to engineering practices. The section thoroughly covers a relatable topic like bungee jumping to reinforce the concepts of bouncing and impulse.
- In Chapter 7.2, the materials offer a Sensor Activity that gives an in-depth exploration of water pressure. The activity starts by relating common experiences, such as being in a pool and snorkeling, to the concepts of water pressure. The materials give many opportunities to relate the concepts to prior knowledge but do not offer engineering opportunities.
- In the "Instructor Resources," there is a link to a document called “Teaching Tips" that contains misconceptions. For example, In “Teaching Tips for Chapter 13,” a misconception states, [a] prism changes (rather than separates) white light into colors.” Materials provide misconceptions based on students’ prior knowledge and experience of prisms and light.

Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.

- In Chapter 7.2, the materials offer a Sensor Activity that gives an in-depth exploration of water pressure. The activities cover the concept of water pressure thoroughly, and the materials outline the goals and concepts that are being covered by this series of activities. The teacher and learner must make these connections on their own throughout the series of activities.
- The materials provide support to the teacher for all of the objectives and goals listed. Support for the explanations behind the goals can be found in the Teaching Tips section, which includes goals designated by bullet points and includes possible student misconceptions. This section specifically outlines teaching tips for each section of the chapter. Each lesson also includes an “About this Lesson” section that lists the learning goals for the lesson. For example, in Chapter 11, all the sound and wave phenomena are listed in correlation with the objectives for that chapter, such as the phenomenon of slinky waves, with the correlating objective “to distinguish between transverse and longitudinal waves.”

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Indicator 3.1

Materials are designed to build knowledge systematically, coherently, and accurately.

1	Materials are designed for students to build and connect their knowledge and skills within and across units.	PM
2	Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding.	PM
3	Materials clearly and accurately present course-specific core concepts and science and engineering practices.	PM
4	Mastery requirements of the materials are within the boundaries of the main concepts of the course.	PM

Partial Meets | Score 3/6

The materials partially meet the criteria for this indicator. Materials are designed to build some knowledge systematically, coherently, and accurately.

Materials are somewhat designed for students to build and connect their knowledge and skills within and across units. Materials are sometimes intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding. Materials sometimes clearly and accurately present course-specific core concepts and science and engineering practices. Mastery requirements of the materials are sometimes within the boundaries of the main concepts of the course.

Evidence includes but is not limited to:

Materials are designed for students to build and connect their knowledge and skills within and across units.

- Most chapters of the materials contain learning objectives. Some chapters do not have learning objectives, such as Chapters 4 and 5. The following lessons (Lesson 6.1: Newton's Insights, Lesson 6.2: Inverse Square Law, Lesson 6.3: The Mass of Earth, and Lesson 6.4: Projectile Motion) contain several lesson objectives such as "Explain Newton's idea that the Moon falls toward the Earth like an apple does. Explain why the Moon does not fall into the Earth and the planets do not fall into the sun. State Newton's law of universal gravitation."
- Materials present content in a way that builds in complexity within the unit; for example, Lesson 2.1, Acceleration, starts analyzing balls rolling down inclined planes where balls gain the same amount of velocity in equal time intervals. This analysis helps students build a conceptual understanding of acceleration. Later in the unit, students compare accelerated and non-accelerated motion, finally culminating with a problem/practice of uniformly accelerated motion.
- In Chapter 4, the materials put each core concept into its own section and supply activities to support the concepts. The concepts themselves are explained clearly, and there are plenty of questions, videos, concept checks, etc. The materials lack connections between topics. Some sections go right to the new material. For example, in Chapter 4.3, the materials do not state any connections to previous material or any learning objectives. Instead, the materials start explaining the concept of changing momentum right away. The concepts lack context. They are often presented in isolation without context or guidance. The materials present the concepts in

a logical sequence that builds knowledge, such as the chapters progressing from Newton's First Law to the Second Law and then the Third Law, but the materials do not make it clear which concepts or skills are being covered. Each section simply has a title and then presents information. Each concept seems to be presented in isolation. For example, in Lesson 2.1, the lesson is titled "Acceleration," and the following Lesson 2.2 is titled "Net Force Causes Acceleration," which implies a progression of knowledge. However, no explicit connections, statements, or recalls to the previous chapter are made, leading the reader to potentially miss opportunities to make connections between the chapters.

- In the About this Program section, the Lesson and Activity Pacing Guide shows the progression of topics that the materials will cover. Each topic has activities and lessons connected. This sequence of lessons and activities is structured to help the students build their knowledge of the concepts. The guide does not show connections within units or across units.
- In Chapter 9, materials provide for students to connect their knowledge across the unit and to previous knowledge/experiences. For example, materials begin with familiar situations, such as rubbing a balloon on hair or interactions with plastic wrap, even using the term electron. After presenting these everyday situations, materials present Coulomb's Law in 9.2, Quantifying Charges. Next, in 9.3, materials present other phenomena caused by these charges (current and voltage) to build knowledge systematically. Materials did not present connections to future learning goals or across future units
- In Chapter 11, materials connect the students' knowledge across the unit and to previous knowledge/experiences. For example, in 11.1, materials present students with the vocabulary word wave in context to a bug or leaf on water. Materials link this familiar pattern created by this object to a wave. Materials further explain sound and light are other examples of waves. In 11.2, materials provide specific vocabulary and parts of waves. Materials provide for subsequent sections to explain wave behaviors based on 11.1 and 11.2 content to build knowledge systematically. Materials did not present connections to future learning goals or across future units.

Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding.

- When presenting concepts, materials include a progression of concrete, then representational, before arriving at abstract reasoning; for example, Lesson 1.1, Motion of a Rolling Ball, starts with the concept of push or pull, then goes into Galileo's discovery where he shows that a force is needed to keep an object moving (when friction is present). Students finally arrive at Galileo's reasoning that a ball moving horizontally would move forever if friction were entirely removed.
- Materials sequence instruction in a way that activates or builds prior knowledge before explicit teaching occurs, but sometimes explicit scaffolding is missing. For example, Chapter 9: Electricity, starts by addressing the concept of electric charge and how like charges repel one another and unlike charges attract one another. The concept of electric charge, as a quality of matter, opened the door to learning about subatomic particles and the charges of protons and electrons. Lesson 9.1 ends with static charge, a building block for the understanding of electric force, which will be studied in the following lesson.
- In Chapter 4.2, the materials give the necessary information about impulse and then state the correlating formulas. The sequence allows for building toward understanding, but there is a lack of scaffolding and guidance beyond the text, formulas, and questions.
- In Chapter 4.5, the materials present all of the necessary concepts for conservation. But the information is presented in one large chunk. All concepts are present, but there is no

scaffolding. It is all presented in text and diagrams with concept checks at the end. There does not appear to be a progression or building toward the concept check.

- In "Teaching Tips for Chapter 9," materials present teachers with many concrete examples and demonstrations to show the phenomena of electricity. Materials present concepts in Chapter 9 before formulas are introduced to build knowledge coherently. For example, in 9.1, materials present electric charge before 9.2 Coulomb's law. In 9.4, materials present a PhET simulation showing the relationship between voltage, current, and resistance, although the formula with calculations is presented first. Materials use Ohm's Law in subsequent sections
- In "Teaching Tips for Chapter 11," materials present teachers with many concrete examples and demonstrations to show the phenomena of waves. Materials present some concepts before formulas. For example, in 11.1, a brief explanation of the inverse nature of period and frequency is discussed before explaining the wave velocity formula, and there is a connection to the real world with the vibrations of strings of musical instruments. The wave speed formula is used in subsequent sections.

Materials clearly and accurately present course-specific core concepts and science and engineering practices.

- Materials clearly provide instruction in course-specific core concepts; for example, Chapter 3 contains a document in the Instructor Resources section called Hands-On Activities Instructor Notes. The document only makes two explicit references to science and engineering practices, one in Section 03.06, Catenaries, and the second in Section 07.02, Spout Altitude. No other reference to science and engineering practices (SEPs) is found in the course document.
- Materials clearly and accurately present course-specific core concepts; for example, Lesson 3.1, Interactions, presents a Quick Activity where students interact with a rubber band, stretching it with two fingers. This activity is an entryway to the course-specific core concept of action-reaction.
- On the course landing page, materials lay out core-specific concepts by unit. SEPs are not clearly lined out and vary by unit. For example, in "Hands-on Activity 10.3," the purpose is to "[b]build a simple motor and test the effect of stronger magnets." However, this is not clearly found when presented with the overall unit plan.
- In the "Field Journal Approach" section within the "About this program" section, materials provide teachers with instructions on how to use the embedded field journal for students to "document your observations, experiences, ideas, questions, and reflections within an accompanying composition notebook." Materials do not provide a clear or concise list of these activities, but they are embedded within each unit. In addition, most, but not all, of these activities are investigatory. For example, in "Phenomenon 13.4," students are asked to "[r]esearch and then write formal definitions for: diffraction, dispersion and interference" without any additional scientific processes.

Mastery requirements of the materials are within the boundaries of the main concepts of the course.

- Materials and learning activities align with the assessment and practice throughout the lesson; for example, in Chapter 4, Momentum, the Instructor Resources section has a Draft Letter to Parents and Caregivers where the only stated objective is to learn that momentum is equal to mass times velocity. None of the lessons contained in Chapter 4 provide clear learning objectives.

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- Mastery requirements of the materials are within the boundaries of the main concepts; for example, Lesson 1.1, Motion, presents the concepts of motion and inertia using text and videos. After each video, there is a question that requires only the video to answer. There is also a concept check; a ball rolling on a pool table slowly comes to a stop. Students must imagine how Galileo would explain it and how the student would explain it, using only the concepts explored during the lesson.
- In the Chapter 2 instructor resources, the materials link to a document called “Teaching Tips.” This document states: “After studying this chapter, students will be able to,” and it lists the concepts students will learn and the skills they will master. These mastery requirements are explicitly stated, and the rest of the document offers support on how to guide the students to mastery of these concepts and skills. This document explains the boundaries and illustrates how the following chapter stays within these boundaries.
- In Chapter 2, the materials contain learning objectives but do not explain the boundaries of the course in student-facing materials. The teaching tips document explains the boundaries of the course and includes the learning goals as well. For example, the teaching tip documents for Chapter 2 state, “In Chapter 1, the concept of inertia was introduced—the property of matter wherein changes in motion are resisted. Things at rest tend to remain at rest; things moving tend to remain moving—if no forces are exerted. Now we learn about acceleration—the change in velocity that objects experience when a force is exerted.” This statement explains the boundaries of Chapter 2 and connects it back to Chapter 1.

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Indicator 3.2

Materials provide educative components to support teachers' content and knowledge coherence.

1	Materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices.	M
2	Materials contain explanations and examples of science concepts, including course-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS.	M
3	Materials explain the intent and purpose of the instructional design of the program.	M

Meets| Score 6/6

The materials meet the criteria for this indicator. Materials provide educative components to support teachers' content and knowledge coherence.

Materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices. Materials contain explanations and examples of science concepts, including course-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS. Materials explain the intent and purpose of the instructional design of the program.

Evidence includes but is not limited to:

Materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices.

- Instructional materials include guiding documents that support teachers in understanding how new learning connects to previous and future learning across the course; for example, the "About This Course" section has a link to a document that explains how concepts progressively dive into deeper knowledge. In the beginning, this concept progression deals with basic topics such as motion, energy, electricity and magnetism, light, sound, and nuclear processes, all providing a necessary foundation from which a student can reach for his or her potential.
- There is a Curriculum Map provided to teachers that supports their understanding of the curriculum and how each chapter connects and relates to the other chapters within the materials.
- Materials include a Vertical Alignment Grid that shows the post-secondary content across high school courses in the resource. Red arrows show which concept "sets the stage for," and blue arrows show which concepts the materials "reinforce."
- In the "About this Program" section, the materials provide an outline of the concepts covered and the order in which they are covered. For example, in Chapter 4, the materials state learning goals and connections to prior knowledge or lessons. The materials make it clear which concepts

or skills are being covered. This information can be found in the teaching tips documents under the teacher resources tab at the beginning of each chapter.

Materials contain explanations and examples of science concepts, including course-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS.

- Materials include information for teachers about common course-level misconceptions; for example, Teaching Tips, located in Chapter 6, Gravity, provide a list of possible misconceptions to correct, such as “Not so! Newton discovered gravity rather than discovering that gravity is universal.” Later in the same teaching tips document, there is information about gravity as universal to support the teacher in correcting the misconception.

- In Chapter 3, Newton's Third Law, only one of several lessons elicits background information. Lesson 3.1 starts by reminding students what has been considered in the previous chapters where force was referenced simply as a push or a pull. This information is useful in the current chapter to learn that Newton realized that a force is more than just a single push or pull.

- In Chapter 4, Instructor Resources, the materials offer a Teaching Tips document that has a list of possible misconceptions. The document then gives a thorough sequence of concepts to teach with explanations of how to disseminate information. Many example suggestions are given in this section to support the teacher and help the students build knowledge. The teaching tips also offer guidance on “points of confusion” with explanations of concepts. It states: “Point of confusion: In boxing, one ‘follows through’ whereas in karate one ‘pulls back’. But this is not so—a karate expert does not pull back upon striking his target. He or she strikes in such a way that the hand is made to bounce back, yielding up to twice the impulse to the target (just as a ball bouncing off a wall delivers nearly twice the impulse to the wall than if it stuck to the wall).”

- In Chapter 4.2, the materials offer text explanations and examples, video checks and examples, examinations of phenomena, and questions to consider. The lessons do not have explanations of misconceptions embedded within. The materials only provide them in the instructor resources.

- Materials provide a list of misconceptions for teachers in the “Instructor Resources” for each unit. For example, in “Teaching Tips for Chapter 9,” the instructor is provided with a list of misconceptions. Additional barriers to concept development are not supplied.

Materials explain the intent and purpose of the instructional design of the program.

- The materials explain the rationale for the program in the About This Program section, where it states that the structure of the program blends the traditional textbook text with video lessons complementing the text. In the same section, they explain that there is a library of hundreds of activities to allow students multiple opportunities to explore physics concepts.

- Materials provide a purpose or rationale for the structure and design of the learning activities; for example, Teaching Tips, located in Chapter 1, Newton's First Law, provides a rationale for the design of the learning activities, stating that when they show a demonstration to illustrate a particular concept, there is almost always more than one concept involved, similar to what happens with the tablecloth demo, illustrating impulse and momentum in Chapter 4.

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- In the About this Program section, the materials provide a letter to instructors that explicitly state the purpose and intent of the design of these resources. The letter states: “[The program] blends the traditional textbook paragraph with video lessons complementing those very same paragraphs. The paragraphs allow students to read. The videos allow them to watch and listen. Working together, these two formats optimize learning and set the stage for classroom activities emphasizing best science and engineering practices as well as cross-cutting concepts.”
- In the About this Program section, the materials link to a document called “Handbook of 'Just in Time' Activities.” This document gives an analysis of the activities, including the type, the value, and the implementation. The document gives a description of the type of activity and when/how to use it.

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Indicator 4.1

Materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

1	Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers.	M
2	Materials provide multiple opportunities for students to engage with course-level appropriate scientific texts to gather evidence and develop an understanding of concepts.	M
3	Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts.	M
4	Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.	M

Meets | Score 4/4

The materials meet the requirements of this indicator. Materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

Materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers. Materials provide multiple opportunities for students to engage with course-level appropriate scientific texts to gather evidence and develop an understanding of concepts. Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

Evidence includes but is not limited to:

Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers.

- In Lesson 1.1, Motion, the concept check section asks, "A ball rolling on a pool table slowly comes to a stop. How would Aristotle explain this behavior? How would Galileo explain it? How would you explain it?" This question provides the student a sense-making opportunity because they can arrive at the right explanation by passing through the misconception cemented by Aristotle about the nature of motion.
- In Chapter 4.6, the materials give a variety of activities to explore the concept of momentum conservation. This includes sections of reading, writing, thinking, and discussion. It also includes a PhET simulation to allow students to act as a scientist to explore the concept. This chapter includes meaningful sensemaking through the full range of methods.
- Chapter 5 gives nine sections of reading, two dedicated writing sections, three thought/discussion sections, ten simulator/hands-on/phenomena activities, plus many practice

problems. There is a large variety and frequency of meaningful sensemaking approaches throughout the entire chapter.
- In “Phenomenon 9.1: Lightning,” materials provide for a student introduction to a familiar topic, then they watch a video looking at lightning. Next, materials guide students in using sticky tape to investigate positive and negative charges. Materials provide additional questions that engage students in thinking about parallels for the activity. Materials provide for written responses.

Materials provide multiple opportunities for students to engage with course-level appropriate scientific texts to gather evidence and develop an understanding of concepts.

- Materials provide opportunities for students to engage with scientific texts to develop an understanding of concepts and offer opportunities beyond the content of the lesson. For example, Lesson 2.1, Acceleration, provides students the opportunity to engage with text within the lesson to learn about how the early work of Galileo, experimenting with inclined planes, paved the road to the understanding of how velocity changes over time under the influence of gravity. There are links to other scientific texts that allow students to explore other topics related to the chapter.
- Materials provide opportunities for students to engage with scientific texts that include activities, such as pre-reading and vocabulary, to help them develop an understanding of concepts. For example, Chapter 5, Writing 5.1: Energy Map (Before), has a pre-reading activity to gauge the current level of understanding where students complete a thinking map about energy, then students go over the definition of energy, forms of energy, energy units, and what can be done with energy. All these activities are in preparation for the understanding of energy.
- Materials provide definitions for words within the text; materials also provide for students to research words. For example, in “Phenomenon 13.4: Diffraction,” materials ask students to, “[r]esearch and then write the formal definitions for diffraction, dispersion, and interference.”

Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts.

- Materials provide more opportunities for students to communicate thinking on scientific concepts in writing rather than in graphic modes. Lessons often ask students to respond to questions communicating their thinking in writing. For example, in Chapter 3, Lesson 3.2, Deer Stuck on Ice, in the section Think About It (Your Turn), there is a question about a strongman pushing apart two initially stationary freight cars of equal mass before he alone drops straight to the ground. Students must explain if it is possible for him to give either of the cars a greater speed than the other. Why or why not? This opportunity allows students to communicate in written form but not graphically or using models.
- In Chapter 4.1, the materials provide a sensor activity to measure and collect data on a crash cushion using a toy car and ramp. The activity provides many prompts for thinking and discussion. It also gives students a chance to create and analyze their data in graph form. The materials provide graphical examples and a section to practice graphical data analysis.
- In “Hands-On Activity 9.3,” materials provide for students to engage in written, graphical modes of communication to support students in developing scientific concepts. For example, materials ask students to graph battery numbers versus voltage and create a best-fit line. Materials also state, “[t]think about the following…” as students evaluate their materials, the material's properties, and the effect they have on the data as a written prompt. Lastly, materials provide

an array of questions to answer in a conclusion sentence. One question states, “[h]ow might you remove the zinc from a post-1982 copper penny?”

Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

- Students often face misconceptions, and through guided questions or activities, they form their own thesis/antithesis to arrive at a new conceptual understanding. For example, Lesson 4.3, Snap Lab Mass and Weight, prompts students to use a bathroom scale to investigate mass and weight, first by challenging a common misconception in physics by asking them, “What do bathroom scales measure?” Students are confronted with the concepts of mass and weight and how the scale provides measurements in mass units. The cognitive struggle takes students to the conclusion that scales detect weight but are calibrated to display mass.
- Materials offer students the opportunity to learn from engaging in phenomena, supporting them as they make sense of new concepts. For example, Chapter 6.5, Satellites, offers students the opportunity to learn how satellites have different periods (the time for a complete orbit about the Earth) depending on the distance from the Earth, comparing the period of the Moon with the period of satellites around the equator.

Myriad Sensors Conceptual Academy Physics

Indicator 5.1

Materials promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.

1	Materials prompt students to use evidence to support their hypotheses and claims.	M
2	Materials include embedded opportunities to develop and utilize scientific vocabulary in context.	M
3	Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and course.	M
4	Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.

Materials prompt students to use evidence to support their hypotheses and claims. Materials include embedded opportunities to develop and utilize scientific vocabulary in context. Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and course. Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations of phenomena and/or solutions to problems using evidence acquired from learning experiences.

Evidence includes but is not limited to:

Materials prompt students to use evidence to support their hypotheses and claims.

- Lesson 2.4, Mass Resists Acceleration, asks students to imagine they apply the same amount of force to two carts, one cart with a mass of 4 kg and the other with a mass of 8 kg. Students then explain which cart will accelerate more and how much greater the acceleration will be. This question demands that students use the inverse reciprocity nature of mass and acceleration in these types of scenarios.
- In Lesson 3.5, Horse-Cart Problem, the concept check question prompts students to explain if after the horse gets the cart moving at the desired speed, the horse must continue to exert a force on the cart. The answer requires students to gather evidence from previously studied concepts, like action-reaction pairs and the concept of friction. Students can demonstrate deep conceptual understanding with their written or verbal responses.
- The sensor activity in Chapter 6.4 instructs students to set up a ramp to create a projectile. The students then collect and analyze data and use the appropriate formulas to confirm the landing spot of the projectile.

- In “Hands-on 11.3,” materials provide for students to use evidence to support claims. For example, materials ask, “Conclusion: Summarize what you have learned about the creation of sound. Explain why adding water to a singing wine glass changes the pitch as it does.” Materials provide for students to conduct an experiment to see this trend. In order to answer the question, students would use observations/evidence to support their answers, although that requirement is not specifically stated.

Materials include embedded opportunities to develop and utilize scientific vocabulary in context.

- Materials allow students to use the acquired vocabulary. For example, in Lesson 2.2, Net Force Causes Acceleration, the Concept Check questions ask students to generate answers that require them to use acceleration and deceleration in the context of the effect of applied forces on objects.
- In the Look at Phenomena in Chapter 5, the materials ask students, “In your own words and in your own way of thinking, write definitions for the following terms: kinetic energy and potential energy.” The materials also provide the definitions for these terms. The chance to use the vocabulary is embedded into an activity.
- The materials provide a field journal. Throughout all chapters, the materials prompt students to use this journal to write and practice the formal definitions of key terms. It also gives students chances to put these into their own words.
- In “Phenomena 13.4,” materials provide opportunities for students to develop and utilize scientific vocabulary. Materials provide support in describing terms, followed by students writing their own definitions. Finally, students look up the definition.

Materials integrate argumentation and discourse throughout to support students’ development of content knowledge and skills as appropriate for the concept and course.

- Materials allow students the opportunity for argumentation. For example, Lesson 6.5, Satellites, invites students to reflect on what would happen If a stone is thrown fast enough so that its curve matches the Earth’s curvature. Students bring discourse and reasoning to explain why it will become a satellite.
- In the activity in Chapter 6.4, the materials prompt the students to discuss their results: “Discuss results of this activity including possible sources of error.” It then gives the students a follow-up question to discuss: “If you have the ‘half-pipe’ ramp from the Acceleration and Ramps activity, then where should this half-pipe ramp be placed (upside right) in order to catch the cups? Why might it actually be impossible for the cups not to ride out of this ramp? Think in terms of potential and kinetic energy.”
- In Chapter 6.3, the materials prompt the students to write a letter to Albert Einstein to discuss gravity. The materials suggest writing what you understand and what you don't. It encourages students to ask him questions about the things they don't understand.
- In “Writing, 9.2,” materials provide for argumentation and discourse to support the development of content knowledge. For example, the materials state, “If your last name begins with A - K, write a paragraph in support of electric cars. If your last name begins with L - S, write a paragraph in support of gasoline combustion cars. Be prepared to use your paragraph as the basis of a class presentation. Be prepared to present scientific explanations for respectful class discussions.”

Myriad Sensors Conceptual Academy Physics

Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.

- In Lesson 1.3, The Law of Inertia, students explain why a slow continuous increase in the downward force breaks the string above a massive ball, but a sudden increase breaks the lower string. This question demands a justification from students and allows them the opportunity to provide it in writing or verbally using the concept of inertia.
- In Chapter 4.3, materials prompt the students to use reason to justify the design of a runaway truck ramp: “Ask students why truck runaway ramps tend to be so long. Why can't a short one work just as well? Why is it useful for the runaway ramp also to be inclined uphill?” The materials then give the students a video and activity to reinforce the concept before discussing it again.
- In Chapter 6.3, the materials prompt the student to list all instances of gravity they have witnessed since waking up. It also encourages students to create a poem and also a fantasy story where gravity doesn’t exist. It asks students to predict what the consequences would be and to integrate these consequences into their stories.
- In “Phenomena 13.4,” materials provide opportunities for students to construct written arguments that justify explanations of phenomena. For example, the materials state, “[w]hen driving through the mountains, why are AM radio signals easier to receive than FM radio signals?” and “[w]hy do shadows tend to have blurred edges?” Materials lead students to use what they have learned to justify the phenomena.

Myriad Sensors Conceptual Academy Physics

Indicator 5.2

Materials provide teacher guidance to support student reasoning and communication skills.

1	Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking.	M
2	Materials include teacher guidance on how to scaffold and support students' development and use of scientific vocabulary in context.	M
3	Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims.	PM
4	Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions.	M

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials provide some teacher guidance to support student reasoning and communication skills.

Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking. Materials include teacher guidance on how to scaffold and support students' development and use of scientific vocabulary in context. Materials provide some teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions.

Evidence includes but is not limited to:

Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking.

- In Chapter 4, the Teaching Tips section provides guidance on the possible misconceptions and how to correct them: "Possible Misconceptions to Correct • Not so! Impulse equals momentum rather than a change in momentum. • Not so! Momentum is conserved only when a collision is elastic. • Not so! Impact force and impulse are the same."
- In Chapter 4, the Teaching Tips section provides guidance on questions to ask to deepen students' understanding: "After stating that a cement truck will always have more inertia than an ordinary roller skate, ask if a cement truck will always have more momentum than a roller skate."
- In "Teaching Tips for Chapter 13," materials provide correct answers for student responses and questioning for deeper thinking. For example, the materials state, "CHECK YOUR NEIGHBOR: Why are interference colors not seen from gasoline spilled on a dry surface? [Only one plane reflecting the surface is present. The lower surface of the gasoline film is also not plane, but as irregular as the road surface it rests upon.]." In addition, misconceptions are provided at the beginning of the section, which could be implied as anticipated student responses.

Myriad Sensors Conceptual Academy Physics

Materials include teacher guidance on how to scaffold and support students' development and use of scientific vocabulary in context.

- Materials provide embedded support for the teacher in how to scaffold students' development of scientific vocabulary and also provide explicit teacher guidance. For example, Lesson 4.1, Inertia in Motion, uses questioning as a form to scaffold the understanding of the new term, momentum. The question used is, "Why are the engines of a supertanker normally cut off 25 km from port? And why do they need tugboats to safely navigate into the port?" The topic of study is momentum, and the example lays the foundation for the integration of the new vocabulary word.
- Lesson 6.4, Projectile Motion, provides a thought experiment to support and scaffold students' development of vocabulary. The materials suggest for the teacher to use this activity to scaffold student understanding of the words horizontal in the context of horizontal projectile motion. The scenario is as follows: "At the instant a horizontal cannon fires a cannonball from atop a high cliff, another cannonball is simply dropped from the same height. Which hits the ground below first, the one fired downrange or the one that drops straight down?" This question provides support for the development of the projectile motion concept, horizontal velocity, and vertical velocity.
- In "Teaching Tips for Chapter 13," materials provide teacher instructions for the use of scientific vocabulary and supply guidance on how to scaffold vocabulary; for example, materials state, "Discuss how light travels in bunches of light—photons, whose energies are directly proportional to their frequencies— E ~ f. Conventional thinking about light is that it is wavelike in traveling from place to place, but particle-like when incident upon matter, as evident in various double-slit experiments." Materials provide teachers with an opportunity to introduce vocabulary and provide guidance about creating a "Word Window" for the class. All vocabulary words for the entire course are included in the Word Window scaffolding document.

Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims.

- In Chapter 5.3, the materials provide a look at the phenomenon of roller coasters. The materials give group work to think and discuss, and then they give a chance to write independently. The materials give students opportunities for discourse and writing but do not offer guidance on how to do so.
- Materials provide teacher guidance on preparing for student discourse. For example, the Next Time Question in Lesson 6.1, Earth Plank, allows students to dive into a thought experiment where they consider a giant flat plane that touches the Earth at one point and extends out into space. Students analyze what would happen if a push is given to an object sitting in the frictionless plank. The activity provides the teacher with the correct answer, its explanation, but also possible teacher responses to address misconceptions. The activity goes as far as modifying the original thought experiment to make the original more understandable.
- In "Writing 9.2: Electricity," materials provide the opportunity for students to engage in discourse but do not give any teacher support. Materials state, "If your last name begins with A - K, write a paragraph in support of electric cars. If your last name begins with L - S, write a paragraph in support of gasoline combustion cars. Be prepared to use your paragraph as the basis of a class presentation. Be prepared to present scientific explanations for respectful class discussions." Although materials state "respectful class discussion," materials do not provide

specific teacher guidance on using evidence to construct written and verbal claims for this exercise.

- In the "Activity Handbook," materials provide guidance on how to prepare students for discourse by guiding teachers on creating a class culture of learning. For example, materials provide sections called "A Culture of Learning," which explains the rationale of class culture, and "Initiating a Culture of Learning," which describes when to implement. Specific guidance on how to do this, given any circumstances, or other techniques, is not supplied.

Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions.

- In Lesson 2.6, Friction, students are provided with the opportunity to learn about friction while reflecting on a thought experiment about forces acting on a crate. The experiment starts with a small pull that doesn't generate movement, up to a constant force that makes the crate accelerate. The lesson then encourages teachers to have students discuss and share their thinking with their classmates until understanding and consensus is reached.
- In Chapter 5.4, the Next Time Question section offers a question about energy in a roller coaster. The materials encourage teachers to have students discuss the solution: "Think about the following question. Better yet, discuss this question with others. The answer will be revealed 'next time' we meet." The students are given a chance to discuss and make verbal arguments. The guidance for teachers allows students plenty of time to process and think about their answers and gives them a chance to make sense of the topic before the answers are simply stated to them as a class.
- In "Teaching Tips for Chapter 9," materials provide for students to share thoughts and find solutions. For example, the materials state, "CHECK YOUR NEIGHBOR: When turning the key to start a car, electrons migrate from the negative battery terminal through the electric network to the starter motor and back to the positive battery terminal. Estimate the time required for electrons to leave the negative terminal, go through the circuit, and return to the battery. Less than a millisecond? Less than a second? About a second or two? Or about a day? (Class interest should be high when you announce the latter answer!)." This guidance for teachers engages students in real-world scenarios and gets students prepared to share their thinking with others while working collaboratively to find solutions.

Myriad Sensors Conceptual Academy Physics

Indicator 6.1

Materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.

1	Materials include a range of diagnostic, formative, and summative assessments to assess student learning in a variety of formats.	M
2	Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment.	M
3	Materials include assessments that integrate scientific concepts and science and engineering practices.	M
4	Materials include assessments that require students to apply knowledge and skills to novel contexts.	M

Meets | Score 2/2

The materials meet the critieria for this indicator. Materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.

Materials include a range of diagnostic, formative, and summative assessments to assess student learning in a variety of formats. Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. Materials include assessments that integrate scientific concepts and science and engineering practices. Materials include assessments that require students to apply knowledge and skills to novel contexts.

Evidence includes but is not limited to:

Materials include a range of diagnostic, formative, and summative assessments to assess student learning in a variety of formats.

- Lesson 1.1, Motion, includes questions after reading activities and after each of the three videos used in the lesson. Additionally, there are assessment opportunities after thought experiments and as concept checks. Some of the questions listed include a constructed response, “How did Aristotle classify motion?” a multiple choice question, “According to this video, ancient scholars reasoned a cannonball continues to fly because…,” and a reflection question, “Does a force keep pushing a hockey puck across the ice?”
- Chapter 2 Review has 20 questions, mostly open-ended responses and fill in the blank. Additionally, there are ten questions labeled as “Independent Work,” all of them open-ended responses. This summative assessment is delivered at the end of the chapter. Some of the questions listed are: “What is the acceleration of free fall?” A fill-in-the-blank example is “Shake something to-and-fro, and you're measuring its _____. Lift it against gravity, and you're measuring its _____.” Finally, an example of an independent work question is “If the net force acting on a sliding block is tripled, by how much does the acceleration increase?”
- Chapter 4.3 offers multiple formative assessments in various formats. Embedded into the reading are reading checks, video checks, and concept checks. The materials provide an activity where students examine a phenomenon as well as a practice page to support learning. The Chapter Review for Chapter 4 has multiple summative assessments. The materials provide

interactive flashcards, 20 free response questions, and 20 independent work questions with answers provided.

Materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment.

- In the About this Program section, the materials provide a spreadsheet that covers all TEKS that will be covered. It includes the core concepts and the TEKS for every chapter, broken down by section and time.
- Materials indicate which student expectations are assessed. For example, the program provides a CAP test bank document where all the questions are classified by chapter along with the respective TEKS and/or ELPS relevant to each question item. Additionally, each question has its correct answer and unique question ID.
- Every activity, reading section, or lab has the associated TEKS listed in a blue oval directly to the right of the corresponding activity. Chapter 3, Lesson 3.2, contains a blue bubble to the right of each learning activity, including questions, indicating the student expectation related to the question item. The questions, “Can you identify the action and reaction forces in the case of an object that is falling in a vacuum?” and “Which exerts more force, the Earth pulling on the Moon, or the Moon pulling on the Earth?” are both tagged with TEKS 5.G.i.

Materials include assessments that integrate scientific concepts and science and engineering practices.

- In Sensor Activity 4.1: Crash Cushion Design and Investigation, students work on an investigation design challenge prompted by the questions, “How should crash cushions on highways be designed? In the event of a car crash, how can these crash cushions change the momentum of the car more gradually?” Students pretend to work as engineers from the highway department, and their mission is to make highways safer. Working with the Pocket Lab GForce, hot wheels track, bocks (for a ramp), and a variety of materials to test (paper, cups, staples, etc.). Students collect data from controlled collisions. They later discuss the design of another group and use the information to improve their own crash cushion design.
- The materials offer multiple opportunities for the integration of science concepts and engineering. Chapter 5 looks at phenomena with “try it and see” sections. It also offers a hands-on activity where students investigate mechanical energy.
- Sensor Activity 6.2: Investigating Gravitational Interactions sets students on an experimentation journey with the question, “Are gravitational forces always attractive? How does mass affect them?” To answer these questions, students embark on the construction of a Gravity Well using only a 32-inch hula hoop, spandex tablecloth, clamps, bocce balls, and marbles. Students model how gravity bends space resulting in an “attractive only” type of force, and learn how mass affects it.
- Within the “Hand-On Activity 10.3,” students build a motor, and assessment questions are posed based on scientific concepts and observations. For example, “Build additional armatures with different numbers of loops. How does the number of loops affect the speed of the armature? Why? Use a more powerful magnet. How does the strength of the magnet affect the speed of the armature? Does the orientation of the magnet matter? Use your circuit schematic to explain.”

Myriad Sensors Conceptual Academy Physics

Materials include assessments that require students to apply knowledge and skills to novel contexts.

- In Chapter 1, the materials provide a “next time question.” In this question, the materials give the students a novel scenario with a pendulum and ask the students to make a prediction about its behavior, to be discussed the next time they meet.
- The Think About It questions located in Lesson 2.5 require students to use the acquired concepts of force and acceleration. To answer the questions, “If you push a movable mass twice as hard, what do you know about its acceleration? If the mass is doubled, what then do you know about its acceleration,” students must apply the concepts of acceleration and force in the context of a given mass in order to predict what will happen in the scenarios listed above.
- The concept check questions from Lesson 5.1 require students to apply the recently acquired concepts of work and power, along with their formulas, in order to solve some problems. Examples of the questions include “How much work is needed to lift an object that weighs 500 N to a height of 4 m?” Students use the formula Work = Force x distance to find the solution. “How much work is needed to lift a 1000 N to a height of 8 m?” Again, students use the formula Work = Force x distance.
- In Writing 9.2, students are asked to “Write the plot of a children's book that focuses on the ideas of Coulomb's law.” In Writing 11.4, materials provide for students to “Write a poem or limerick about the reflection and/or refraction of sound. (In a limerick there must be five lines. Lines 1, 2, and 5 rhyme, as should lines 3 and 4.).”

Myriad Sensors Conceptual Academy Physics

Indicator 6.2

Materials include guidance that explains how to analyze and respond to data from assessment tools.

1	Materials include information and/or resources that provide guidance for evaluating student responses.	M
2	Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.	M
3	Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension.	M
4	Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.	PM

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. The materials include some guidance that explains how to analyze and respond to data from assessment tools.

Materials include information and/or resources that provide guidance for evaluating student responses. Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level. Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension. Materials sometimes provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.

Evidence includes but is not limited to:

Materials include information and/or resources that provide guidance for evaluating student responses.

- The Field Journal Approach, located in About this Program, provides a rubric with best practices that will help students and instructors to assess the quality of the information documented in the field journal. The rubric of best practices is in student-friendly language and provides indicators for three categories, "Excellent, Satisfactory, and Needs Improvement." This rubric provides guidance on the quality of text, pictures, data tables, data analysis, graphs, and conclusions.
- In the instructor resources section, the materials provide practice worksheets with answers provided. It also says: "Below are the links to the Practice Page worksheets and worksheet answer keys. These might be printed for use in class or uploaded to your LMS for student use at home."
- In Chapter 6.1, the materials offer a hands-on lab. The materials give teachers guidance on the questions to ask to support student learning. It also gives guidance on what to look for in their field journals and their analysis.
- In Hands-on Activity 8.3, Chilling Extrapolation, students collect data consistent with kinetic molecular theory to estimate the value of absolute zero. The Hands-on activities Instructor Notes provide some considerations about what teachers could do in case of wrong answers, like "The correct temperature should be -273°C, but with experimental error due to our method of measuring volume and also differences in temperature can make this number vary wildly.

Consider any answer between -200°C – -350°C as a good calculated value. The difference in their value vs. the known value can be a jump-off point to talk about the experimental error and ways to reduce it."

- Materials provide sample answers that may be interpreted as guidance for student evaluation. For example, in Chapter 11 Instructor resources, materials provide the teacher with Chapter 11 Review Questions and Chapter 11 Review Questions and Answers.

Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.

- In the About this Program section, the materials provide a spreadsheet that covers all TEKS that will be covered. Teachers can use this information when planning for lessons and assessments.
- Materials support teachers' analysis of assessment data. For example, Chapter 1, Instructor Resources, contains a Test Bank link to a spreadsheet with questions, option choices, and correct answers. The test bank includes a tag with the TEKS tested on each question item. This information can support teachers in analyzing assessment results and planning for interventions. The following are examples of the questions one can find in the test bank: "TEKS 5.G; TEKS 5.E. A rock dropped from a height of 5 meters accelerates at 10 m/s per second. When dropped from 2.5 meters, its acceleration is… TEKS 1.D; TEKS 5.F. While skydiving, your velocity of fall increases, which means your acceleration…"
- Chapter 3 Review section contains 20 questions, provides answers to the odd-numbered questions, and gives support in the analysis of student responses. Some of the questions located in the review section are: "In the simplest sense, a force is a push or a pull. In a deeper sense, what is a force? Answer: A force is an interaction between one thing and another. When you push against a wall with your fingers, they bend because they experience a force. Identify this force. Answer: When you push on the wall, the wall pushes on you. It is the force of the wall on your fingers that bends them." Guidance on responding to student needs and data is found in the assessment guide.
- The materials offer questions to ask, provide responses to look for, and ways to shape the discussion. For example, Chapter 7 offers a chapter review with multiple question types and guidance on how to implement the activities, and it offers guidance on how to evaluate student data/responses using the program.

Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension.

- Instructional materials provide questions aligned with the lesson objectives and the learning materials that teachers may use to plan instruction. For example, Chapter 2, Acceleration, offers a quick multiple-choice question to test conceptual understanding after a video (mini-lesson). The instructor can make decisions about instruction depending on how students respond to the question "Acceleration is the rate at which you change... (a) How far. (b) in time. (c) How fast. (d) How soon."
- Materials provide questions to assess deep conceptual understanding with peer-to-peer interactions. These types of questions/discussions provide teachers with relevant information that can be used to plan for extension activities. For example, Lesson 4.1 includes an activity called Check Your Neighbor. This activity prompts students to engage in deep discussions generated by the statement, "After stating that a cement truck will always have more inertia

than an ordinary roller skate, ask if a cement truck will always have more momentum than a roller skate."

- In Lesson 11.1, assessment questions are asked about readings, videos, and concepts. Teachers can use the results of these assessments to tailor instruction. Specific questions include: "What is a wave?" "The pendulum is an example of… "If the frequency of a wave is 100 Hz, its period is…" and "1. An electric toothbrush completes 90 cycles every second. What are (a) its frequency and (b) its period? 2. Gusts of wind cause the Sears Building in Chicago sway back and forth, completing a cycle every ten seconds. What are (a) its frequency and (b) its period?"
- The materials offer Next Time Questions (NTQ) at the ends of most sections. These questions give students something to think about, and teachers can use student responses to tailor their instruction and lessons. The question asks about gravity and escape velocity, and the materials give guidance on explaining each answer and why it is correct or not. It also suggests things to say about wrong answers and the thought processes that go into each answer to help guide discussions with students.

Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.

- Materials do not provide teacher guidance about how to respond to student performance data. For example, Chapter 5, Instructor Resources section, does not provide guidance on how teachers may use resources for reviewing after direct instruction or action plans for small group instruction in response to student data. To the prompt "CHECK YOUR NEIGHBOR: Does a car hoisted for lubrication in a service station have PE? How much work will raise the car twice as high? Three times as high? How much more PE will it have in these cases?" There is no guidance on how instructors can respond to different scenarios and variations on student responses.
- Materials do not provide guidance on what activities teachers may assign to struggling students. For example, the NTQ provided in Chapter 6 contains only explanations for the right answers, but there are no suggestions on what to do with struggling students. All the NTQ can be found hyperlinked in the Instructor Resources. One such question is, "When at rest on the launching pad, the force of gravity on the space shuttle is quite huge - the weight of the shuttle. When in orbit, some 200 km above Earth's surface, the force of gravity of the shuttle is: (a) nearly as much (b) about half as much. (c) nearly zero (microgravity). (d) zero." Materials provide detailed explanations of why the right answer is (a), but there is no guidance on what to do with struggling students.
- Chapter 7 offers a chapter review with multiple question types, and it provides answers, but none of the activities have guidance on how they can be used in correlation with student data. The materials do offer some activities that could be leveraged in conjunction with student data analysis, but nothing is explicit, and there is no guidance.
- Although a variety of assessment options are provided, no teacher guidance is supplied on how to leverage different activities to respond to student data. For example, in the "Hands-On Activity Guide," materials provide answers for activities in the form of an answer key, but no guidance on the use of student data is provided.

Myriad Sensors Conceptual Academy Physics

Indicator 6.3

Assessments are clear and easy to understand.

1	Assessments contain items that are scientifically accurate, avoid bias, and are free from errors.	M
2	Assessment tools use clear pictures and graphics that are developmentally appropriate.	M
3	Materials provide guidance to ensure consistent and accurate administration of assessment tools.	M
4	Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Assessments are clear and easy to understand.

Assessments contain items that are scientifically accurate, avoid bias, and are free from errors. Assessment tools use clear pictures and graphics that are developmentally appropriate. Materials provide guidance to ensure consistent and accurate administration of assessment tools. Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals.

Evidence includes but is not limited to:

Assessments contain items that are scientifically accurate, avoid bias, and are free from errors.

- Instructional materials contain assessment items that are scientifically accurate, avoid bias, and are free from errors. For example, Lesson 1.2, Speed and Velocity, contains questions that are accurate and free from errors. Some examples of such questions are: “What is the average speed of a cheetah that sprints 100 m in 4 s? How about if it sprints 50 m in 2 s? Provided answer: In both cases, the answer is 25 m/s” and “The speedometer on a bicycle moving east reads 50 km/h. It passes another bicycle moving west at 50 km/h. Do both bikes have the same speed? Do they have the same velocity? Provided answer: Both bicycles have the same speed, but they have opposite velocities because they move in opposite directions.”
- Chapter 2 Review Questions provide items with scientific context for the questions and accurate answers without errors. Some of these questions are: “Distinguish between velocity and acceleration: Suggested answer: Velocity is speed in a given direction, and acceleration is the time rate of change of velocity. The change can be in speed, direction, or both. What is the acceleration of free fall? Suggested answer: The acceleration of free fall is provided only by gravity. On Earth, it has the value 10 m/s2. 5. What relationship does mass have with inertia? Suggested answer: Mass is a measure of inertia. The greater the mass, the greater the resistance to changes in motion.”
- In the instructor resources for Chapter 3, the materials provide both questions and answers: “Distinguish between velocity and acceleration. When are you most aware of motion in a moving vehicle—when it is moving steadily in a straight line or when it is accelerating?” Answers: “Velocity is speed in a given direction, and acceleration is the time rate of change of

velocity. The change can be in speed, direction, or both." and "When the vehicle is accelerating because then you feel a lurching sensation."

- The materials provide questions that are scientifically accurate, avoid bias, and are free from errors. In the Next Time Question for Chapter 4, the materials provide both a question for discussion and the answer for the teachers to lead the discussion.
- Materials provide assessment items that are scientifically accurate, avoid bias, and are free from errors. For example, in Chapter 10, Instructor Resources, materials provide review questions and answers that are accurate and free of bias.

Assessment tools use clear pictures and graphics that are developmentally appropriate.

- The instructional materials use visuals in the assessment items, and the pictures and graphs are developmentally appropriate. For example, Lesson 3.2, Next Time Question: Rock Drop, uses a visual depicting the physics scenario described in the question, which is about the action-reaction forces of a rock in free fall due to the gravitational pull from Earth.
- The instructional materials don't often use visuals in the assessment items, but when present, the pictures and graphs are developmentally appropriate. For example, Lesson 4.1, Phenomenon Building Connections, has an assessment item about a real-life situation at the beach; the picture used is appropriate for the grade level. The question reads, "How is it that we can be so easily knocked over by an ocean wave when in the water along a beach?" In the Next Time Question for Chapter 4, the materials provide pictures depicting tug-of-war to provide context for the question.
- The materials provide numerous graphics and clear pictures. For example, in 9.3, multiple forms of visuals are given for the lesson; however, an area in need of improvement is the assessments. Adding more graphics to the assessments would be beneficial.

Materials provide guidance to ensure consistent and accurate administration of assessment tools.

- Materials provide guidance to ensure consistent and accurate administration of assessment tools. There is a reference to assessment tools within the reference section of a hyperlinked document in the About This Program section. There is a document that explains the types of assessments the program uses and how to administer these assessments.
- The materials provide tips about using the review questions in Chapter 4, About These Review Questions. Review questions are designed to help the student review the main ideas of the chapter. Ideally, the student tries to answer the question on their own before looking at the answer key provided below as well as within a flash card format. The answers, however, are only provided for the odd-numbered questions. For deeper assessment, the even-numbered questions are made available in a "Short Answer" format that may be submitted for credit. The teaching tips in Chapter 4 provide tips for the lessons within; in addition, this section provides tips for assessments, such as how long to give, how many questions to assign, and whether the assessments are meant to be independent or collaborative.
- Chapter 5 Instructor Resources makes a short reference to assessment implementation by providing a link to a spreadsheet of test bank questions for all chapters of the program. Instructors might use these questions for quizzes and exams. Instructors might also reformat this spreadsheet for upload to a learning management system.

Myriad Sensors Conceptual Academy Physics

Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals.

- The materials provide guidance on the implementation of accommodations. The Chapter Review section in Chapter 4 has four review sections, and recommended accommodations to provide are suggested in the CAP Accommodations document . For example, Chapter 4, Instructor Resources, provides assessment items and answers to some of them, and there are options to shorten the assessment as an accommodation.
- Materials do not include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with learning goals. For example, Lesson 6.2, Inverse-Square Law, has several assessment items, but there are no options for accommodations at any point during the lesson.
- Accommodations such as shortening of tests, text-to-speech (directly from the publisher), etc., are available to teachers to implement should their students need these accommodations.

Myriad Sensors Conceptual Academy Physics

Indicator 7.1

Materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

1	Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved mastery.	M
2	Materials provide enrichment activities for all levels of learners.	M
3	Materials provide scaffolds and guidance for just-in-time learning acceleration for all students.	M

Meets | Score 2/2

The materials meet the requirements for this indicator. Materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved mastery. Materials provide enrichment activities for all levels of learners. Materials provide some scaffolds and guidance for just-in-time learning acceleration for all students.

Evidence includes but is not limited to:

Materials provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved mastery.

- Materials provide targeted instruction and activities to scaffold learning for students who still need to achieve mastery of the concept. For example, Chapter 2, Acceleration, Teaching Tips section, guides teachers on how to progressively build up the acceleration concept, starting with defining acceleration to later engaging in examples like falling objects. Materials support students with numerical examples of acceleration and its units.
- In Chapter 3.6, the materials offer several types of activities that allow for scaffolding and building toward a targeted objective. In 3.6, the lesson culminates in a hands-on activity involving the forces in catenaries. The lesson starts with reading sections and video checks and uses diagrams and worked examples before giving students the activity.
- In Chapter 4, in the Teaching Tips document, the materials provide a sequence for the entire chapter. In this sequence, the materials offer targeted instruction for the main concepts of each section. It provides discussion points, demonstrations, and scaffolds for practice and activities.
- In the “Pacing Guide,” materials provide for multiple forms of differentiation, although they are not explicitly listed per type of learner, so this information must be inferred. For example, a list of “Hands-on guided” activities, “Writing or Presentation” activities, and “PhET simulation” activities are listed for each chapter. The overview video does state these can be used for differentiation, but materials are not as explicit as how they can be used to differentiate.

Materials provide enrichment activities for all levels of learners.

- Phenomenon 1.2, What in the World, is a descriptive investigation emphasizing scientific practices. In moving around the world in this simulated video, it's important to be able to track

one's progress to know where you are heading and when you might get there. The concept included in this activity includes displacement, speed, velocity, direction, and vector quantities. Students analyze the video and maps to conclude the final destination.

- In Chapter 3, the materials provide a range of activities for all levels of learners. The materials provide numerous video checks, worked-out examples, and practice problems embedded in the lessons. Outside the lessons, the materials link to phenomena and hands-on activities as well for support.
- Lesson 5.1, Next Time Question: Long Cannon, students explain the reason why a longer cannon barrel yields a cannonball with a larger velocity. Students also get to discuss with others and share their thoughts.
- Chapter 7 provides three hands-on activities, two sensor activities, one PhET simulation, and three looks at phenomena. These activities are supplemental to support the lessons, which also include videos and smaller activities. Every section has at least one supplemental way to support learning outside the lesson.
- Materials produce enrichment activities through the use of a field journal. As materials suggest in the “Field Journal Approach” section, a field journal is similar to a portfolio of scientific investigations in the field. Students regularly write and record their thoughts and observations according to prompts from the materials.

Materials provide scaffolds and guidance for just-in-time learning acceleration for all students.

- In the About this Program section, the materials provide an Activity Handbook. This handbook outlines “just in time” activities and ranks them by ease and significance. Each activity has a guide for its purpose and tips for its implementation.
- In the “Pacing Guide,” materials provide for multiple forms of differentiation; each type of scaffold is explicitly listed for the type of learner. For example, a list of “Hands-on guided” activities, “Writing or Presentation” activities, and “PhET simulation” activities are listed for each chapter, and they are accompanied by an icon that corresponds to a scaffold key. The overview video does state these can be used for differentiation, and the assessment guide gives guidance on how to use the activities for acceleration or catching students up.
- In Chapter 4.2, there is an explicit reference to the materials offering a series of activities that scaffold and provide acceleration for students. The materials provide numerous video checks, worked-out examples, and practice problems in the lessons. Outside the lesson, the materials link to phenomena and extra activities as well for support.
- Materials produce enrichment activities through the use of a field journal. As materials suggest in the “Field Journal Approach” section, a field journal is similar to a portfolio of investigative field work. Students regularly write and record their thoughts and observations according to prompts from the materials. Materials provide prompts that show critical thinking, problem-solving, and creativity. Guidance as to what acceleration means is not provided.

Myriad Sensors Conceptual Academy Physics

Indicator 7.2

Materials include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.

1	Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content.	M
2	Materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one).	M
3	Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation.	M
4	Materials represent a diversity of communities in the images and information about people and places.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.

Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content. Materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one). Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation. Materials represent a diversity of communities in the images and information about people and places.

Evidence includes but is not limited to:

Materials include a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content.

- The “Pacing Guide” is a list of hands-on guided activities, writing or presentation activities, and PhET simulation activities for each chapter. Materials provide these activities to engage students with mastery of the content.
- Lesson 1.1 starts by taking students, via scientific text, to the idea that motion requires a force (a push or a pull) goes back to the fourth century BC. The following activity, an instructional video about ideas of motion and inertia, comes with a series of questions in a video check activity. These, and the learning activities that follow, are all developmentally appropriate and offer opportunities for students to engage in learning in a variety of ways.
- Instructional approaches to the instructional materials are developmentally appropriate. For example, in Lesson 2.1, Acceleration, where students learn via scientific text that a ball gains the same amount of velocity each second as it rolls down an incline, is followed by a scenario analysis where there is a change in velocity. Later, students watch a video to improve their understanding of acceleration to finally look into some free fall examples.
- Chapter 7 provides three hands-on activities, two sensor activities, one PhET simulation, and three looks at phenomena. These activities are supplemental to support the lessons, which also

include videos and smaller activities. Every section has at least one supplemental way to support learning outside the lesson.

Materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one).

- Materials have a native platform that allows teachers major flexibility in the grouping. For example, when the instructor is within any lesson and selects the "+" symbol, it opens a menu of choices that allows for additional text, PhEt simulations, group discussions, class discussions, as well as additional content and videos that can be assigned to work individually or in groups.
- In Lesson 3.1 Interactions, students first engage with the scientific text to learn that a force is part of a mutual action—an interaction—between one thing and another. This reading could be individual to later discuss or share thinking in groups with the use of guided questions presented to students to deepen their understanding. The concept check section is one more example of activities that allow for flexible grouping, where students respond to three different questions. The same lesson also has a video that allows for the same flexibility.
- In "Minds-on Activity 9.8," materials provide for individual and group work, but grouping numbers are not suggested. For example, materials provide prompts 1 and 2 as "Group Work," whereas the culminating writing says "Independent Work."

Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation.

- The "About This Program: Organizing a Curriculum using a Double Helical Model" section explains how lessons are organized, and it provides guidance about implementation and order for activities. It also shows that resources are organized around a "Double Helical" model. Briefly, core concept development is surrounded by learning activities emphasizing scientific "ways of doing" as well as scientific "ways of viewing." Following this model within the classroom helps to assure standards are being implemented properly.
- In the "Field Journal Approach," materials provide teachers with guidance and structures of how and when to use the field journal. Materials provide prompts within the field journal sections (within each chapter) for students to think and reflect on learning.
- In the "Handbook of Class Activities," materials provide teachers with guidance and structures of how and when to use the numerous class activities. Materials provide explanations, teacher instructions, student questions, and additional information as needed (within each chapter) for students to observe or participate in the activity.
- Chapter 2, Teaching Tips, contains a detailed guide for each of the parts of the lessons where teachers receive suggestions about how to introduce the concept of inertia, how to provide numerical examples for units of accelerations, prompts for discussions in pairs, and how to proceed with demonstrations.
- Chapter 7 provides three hands-on activities, two sensor activities, one PhET simulation, and three looks at phenomena. These activities are supplemental to support the lessons, which also include videos and smaller activities. Every section has at least one supplemental way to support learning outside the lesson.

Myriad Sensors Conceptual Academy Physics

Materials represent a diversity of communities in the images and information about people and places.

- In Chapter 2, the materials use a photograph of girls playing soccer. The photograph has racial diversity. The rest of the chapter displays mostly cartoon-style clip art. The videos in this chapter have a few lecturers who appear to be white men.
- The cover for Chapter 2 is a picture depicts an African-American girl and a Hispanic girl playing sports.
- Phenomenon 4.2: Karate Chop, located in Chapter 4, depicts an African American person in a video showing a karate demonstration.
- In Chapter 6, the materials provide many pictures and diagrams, but all are clip-art-style cartoons.
- There are not many photographs of people in the materials; most of the art and illustrations are not of people but cartoons and clip-art animals, but when there are photographs, they display the diversity of communities around the world.

Myriad Sensors Conceptual Academy Physics

Indicator 7.3

Materials include listening, speaking, reading, and writing supports to assist emergent bilingual students in meeting course-level science content expectations.

1	Materials include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS.	DNM
2	Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English.	M

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials include some listening, speaking, reading, and writing supports to assist emergent bilingual students in meeting course-level science content expectations.

Materials do not include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS. Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English.

Evidence includes but is not limited to:

Materials include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS.

- Materials do not include guidance for linguistic accommodations. For example, in Lesson 2.1, Acceleration, there is no guidance for linguistic accommodations.
- Throughout Chapter 5, the materials make no mention of ELPS or language standards at all. There is no guidance on how to accommodate emergent bilingual students.
- Although materials provide a list of ELPS-containing activities, the actual materials did not provide guidance for linguistic accommodations. For example, "Practice Page 9.4: Ohm's Law in a Series Circuit" has fill-in-the-blank answers with pictures and no instruction on ELPS implementation or accommodation.

Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English.

- Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. For example, Lesson 3.1, Interactions, contains opportunities for students to use their first language.
- In 11.2 d, materials provide for strategic use of the student's first language as it provides closed captioning for videos in another language.This allows the students to listen to the content in their first language and then students have the option to then translate into English.

- In 11.2 a, materials provide for short, simplistic use of the English language which may be beneficial for English learners. In addition, the program also utilizes a “Word Window” activity that has Spanish and English translations.

Myriad Sensors Conceptual Academy Physics

Indicator 7.4

Materials provide guidance on fostering connections between home and school.

1	Materials provide information to be shared with students and caregivers about the design of the program.	M
2	Materials provide information to be shared with caregivers for how they can help reinforce student learning and development.	M
3	Materials include information to guide teacher communications with caregivers.	M

Meets | Score 2/2

The materials meet the critieria for this indicator. Materials provide guidance on fostering connections between home and school.

Materials provide information to be shared with students and caregivers about the design of the program. Materials provide information to be shared with caregivers for how they can help reinforce student learning and development. Materials include information to guide teacher communications with caregivers.

Evidence includes but is not limited to:

Materials provide information to be shared with students and caregivers about the design of the program.

- The information about the design of the program is located in the “About This Program” section. It describes how the program blends the traditional textbook with video lessons and how this format optimizes learning. The About This Program section also contains a PDF file with the table of contents of the digital textbook, a link to the correlations to the TEKS and ELPS, and lastly, the Texas Edition of the Physics Lesson and Activity Pacing Guide.
- In Chapter 00, About Science, the materials give a letter to caregivers that outlines the course. Overall goals are mentioned along with the mention of updates being provided to caregivers during the year. Caregivers are given access to a summary of the first unit and an example video lesson.
- In Chapter 00, there is a link to an orientation to the course that gives caregivers an outline of the program. The link given provides a six-minute orientation video. Teachers are advised to share the link with students and families. This link helps the teacher make connections with families and caregivers and helps the families and caregivers get involved with their student’s learning.

Materials provide information to be shared with caregivers for how they can help reinforce student learning and development.

- In Chapter 00, the materials give suggestions to caregivers to reinforce the course materials. The materials suggest doing investigations at home as a modified “flipped classroom” which they call a “flipped laboratory.” These flipped laboratories are short experiments and activities meant to be done at home to help reinforce the student’s learning in the classroom.

- Chapter 3, Instructor Resources, contains several pieces of information that can be shared with parents and caregivers in order to reinforce student learning, such as example video lessons (Horse and Cart Problem & Difference Masses), Chapter 3 Next Time Questions, How to Study Effectively, and Chapter 3 Review Questions. These activities help caregivers understand what their students are learning in class.
- In Chapter 5, the materials give students homework practice sessions. The first practice session is an online game. The game is meant to be played with others or alone, at home with family or friends. The materials provide the game and rules for gameplay: “Game Rules 1. Points you earn are only temporary and not identifiable to yourself. 2. Refresh the page: the points will vanish and all is reset. 3. Your short answers are not recorded anywhere and are not graded. 4. Truly attempting each short answer question will help you learn. 5. Don't randomly guess the multiple choice. 6. Go for platinum, Pt. Be happy with copper, Cu, which means you're on your way. 7. Being on the curve is far more important than where you land on the curve. 8. Congratulate each other for being on the curve. 9. Playing a sports game can be fun, but requires effort. No one is exempt 10. Learning can be fun but also requires effort. No one is exempt. 11. The HPS questions are challenging by design. Expect to be challenged. 12. You may learn more from your wrong answers than your right answers. (See rules 7 and 8) 13. Practicing on your own is good. Practicing with others is better. 14. There are many questions in a session. Don't do them all. Do what you can.” This activity allows students to share their learning in a fun and engaging way with their friends, family, and caregivers.

Materials include information to guide teacher communications with caregivers.

- In Chapter 1, the Instructor Resources include a letter template to send to caregivers with information about Chapter 1. It is explained that the program begins with a study of Newton's Laws of Motion. An explanation is given for Newton’s First Law. Caregivers are also provided with an example video lesson.
- The Instructor Resources in Chapter 4 guides communication with parents and caregivers with a letter template containing information about the chapter. An explanation of the concept of momentum is given along with real-life examples to help with understanding. This guidance helps the teacher to foster a relationship with families and caregivers and get families and caregivers involved in their student’s learning.
- The materials provide caregivers with letters about the course content. For example, in chapter 12, Instructor Resources, a letter to the caregiver states, “Dear Parents and Caregivers, Having studied waves in the last unit, we are now set to study electromagnetic waves, also known as light. Light generally arises from vibrating electrons. When they vibrate at just the right frequency, the retinas of our eyes are stimulated, and what we see we call light. Of course, there are many other frequencies of light we do NOT see. All those frequencies together we call the electromagnetic spectrum. For this unit, we'll be exploring light-related concepts such as transparency, reflection, refraction, and, importantly, color. Below is an excerpt from this unit, along with an example video lesson explaining the color of water. Thank you for your continued support!” Materials provide caregivers with letters about course content and direct guidance for teachers for communications. For example, in chapter 10, Instructor Resources, a letter to the caregiver states, “Dear Parents and Caregivers, After exploring electricity, we're now set up to explore magnetism. The term magnetism comes from the region of Magnesia, a province of Greece where magnetic stones were found by the early Greeks. Today much of modern industry—from motors to computers—relies on magnetism. Below is an excerpt from this unit

along with an example video lesson exploring the history of direct and alternating currents.” This letter suggests how to implement the curriculum at home.

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Indicator 8.1

Materials include year-long plans with practice and review opportunities that support instruction.

1	Materials are accompanied by a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials.	M
2	Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices.	M
3	Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include year-long plans with practice and review opportunities that support instruction.

Materials are accompanied by a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials. Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices. Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.

Evidence includes but is not limited to:

Materials are accompanied by a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials.

- The section “About This Program” includes a hyperlink to a document that correlates TEKS and ELPS to each section of the materials. Included in this section is a pacing guide for the year.
- The document lists each instance of each of the TEKS throughout the entire curriculum and denotes whether it is found in an activity or a narrative. The document includes citation URLs that link to the curriculum materials as well as a detailed description of the location of the TEKS within the materials.

Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices.

- In “Phenomena 4.2: Karate Chop,” materials provided to the teacher instruct the teacher to have the students use the scientific practices of predicting and calculating evidence across the core concepts of momentum and impulse. Later, materials give teachers guidance to have students use evidence to connect these findings to real-world examples, such as a diver in a swimming pool.
- In “Hands-On Activity 10.3: Safety Pin Motor,” materials provide teacher and student directions for students to engineer a motor with given materials, keeping a record of their performance in their field journal. “Hands-on Activity: Safety Pin Motor” also allows for additional extension questions and more opportunities for students to demonstrate their knowledge.

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Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.

- In Chapter 1.1, materials provide an “About Science Review” containing fourteen questions about the section, including flashcards and vocabulary review for student use. Odd answers are supplied to students to support mastery and retention.
- In Chapter 1.2, the lesson inserts checks for understanding after every few paragraphs of information. After covering Newton's first law, students can be given a reading check (1.3b), a video (1.3c), and a video check (1.3d). The concept that follows includes a hands-on check for understanding as well as a written concept check.
- In Chapter 6, homework practice sessions contain questions for students to complete in a game fashion. Correct answers to questions are provided to students after answering to support mastery and retention. In addition, there is also a review section containing twenty open-ended and computational questions at the end of the chapter to help students review their knowledge.

Myriad Sensors Conceptual Academy Physics

Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

1	Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning.	M
2	Materials include standards correlations, including cross-content standards, that explain the standards within the context of the course.	PM
3	Materials include a comprehensive list of all equipment and supplies needed to support instructional activities.	PM
4	Materials include guidance for safety practices, including the course-appropriate use of safety equipment during investigations.	M

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials include some classroom implementation support for teachers and administrators.

Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning. Materials do not include standards correlations, nor cross-content standards, that explain the standards within the context of the course. Materials include a list of all equipment and supplies needed to support some instructional activities. Materials include guidance for safety practices, including the course-appropriate use of safety equipment during investigations.

Evidence includes but is not limited to:

Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning.

- Materials provide a navigation video sent by the publisher with the login and password information. The teacher guiding video includes instructions for clicking on the tile for each unit in the book, the breakdown of each section (core lesson) in the book, and navigating various sections. For example, the title labeled “About the Program” provides another link to a spreadsheet listing multiple activities by topic/implementation need, including the practice page, next time question, phenomena, hands-on guided, writing/presentation, sensor activity, and others. The video supports and guides teachers and administrators to activities while recommending a selection of activities based on the needs of students.
- In Chapter 4, “Instructor Resources,” the materials provide an overview of the topics covered and guidance on how to implement these topics. The “Conceptual Academy Physics Teaching Tips” provides a link to a document that outlines the learning objectives, possible misconceptions, and teaching tips for the main topics in each section. This document contains a broad view of the main topics and the ways to teach them, whereas the individual sections provide more specific guidance.
- On the Chapter 11 landing page, a tab called “Chapter 11 Instructor Resources” precedes each section number and title. In this tab, each section for teacher guidance is explained by text. For

example, in the “Conceptual Physics Practice Page Worksheets” section, guidance is provided by the materials with the statement “[t]hese might be printed for use in class or uploaded to your LMS [Learning Management System] for student use at home.” Additional sections (“Complete Test Bank,” “Conceptual Academy Physics Teaching Tip,” “Draft Letter to Parents and Caregivers,” “Chapter 11 Next-Time Questions,” “Hands-On Activities Instructor Notes,” “Handbook of Class Activities,” and “How to Study Effectively” all contain written recommendations for guiding teachers regarding their use in the classroom.

Materials include standards correlations, including cross-content standards, that explain the standards within the context of the course.

- Materials include standards correlations and list out the standards within the lessons. The document with the science standards is located in a document called CAP TEKS/ELPS Final, located in the “About This Program” section. Cross-content standards are not mentioned in the document.
- Standards correlations are embedded in chapters and lessons as well. For example, Lesson 3.2, “Action and Reaction,” lists the TEKS applicable to the lesson in a sidebar. Lesson 3.2 (d) A Simple Rule lists 5.G.i as the applicable TEKS and 4.f.i as the applicable ELPS standard. There were no cross-content standards listed or embedded in the lesson.
- Lesson 4.6 contains a reading passage, a reading check, a concept check, a video, and a video check. The TEKS and ELPS are also embedded in the lesson in sidebars. There are no other standards mentioned, however, such as math or literacy standards.
- In “Phenomenon: 10.6 Wind Turbines,” students read and interpret a bar graph using mathematical connections; however, no explicit cross-content standards, but the TEKS and ELPS are embedded in the lesson as they are throughout the materials.

Materials include a comprehensive list of all equipment and supplies needed to support instructional activities.

- The materials include a list of all equipment and supplies needed to support students during lab investigations; for example, the Salt-To-Water experiment in Lesson 0.5 lists all the materials needed to perform the activity.
- In Lessons 4.5 and 4.6, the materials provide a quick activity to do a hands-on example of the concept. Each "Quick Activity" includes a graphic that shows a list of all the materials to be needed for the activity. This activity includes a picture and does not include a comprehensive list of all equipment or supplies.
- The Hands-On Activity 1.4 offers a supporting document that outlines the materials needed before starting the activity. The “Instructor Notes” section also offers guidance in implementing this same activity.

Materials include guidance for safety practices, including the course-appropriate use of safety equipment during investigations.

- Instructional materials include guidance for safety practices; for example, Chapter 0.0: About Science has a lab investigation in Section 0.5: The Salt-to-Ice Experiment where safety considerations include the Data Safety Sheet for Calcium Chloride in addition to safety notes explaining possible effects of Calcium Chloride on the skin and how to prevent accidents when working with chemicals.

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- In Chapter 1, Instructor Resources, the materials link to a Hands-on Activities Instructor Notes document. This document outlines safety practices for the labs/activities. It offers alternate supplies/activities to accommodate allergies as well as general tips for safe practices.
- In Lessons 4.5 and 4.6, the materials provide a quick activity to do a hands-on example of the concept. Quick activities provide guidance that states that these activities are generally recognized as safe to perform.

Myriad Sensors Conceptual Academy Physics

Indicator 8.3

Materials provide implementation guidance to meet variability in program design and scheduling.

1	Materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities.	M
2	Materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression.	M
3	Materials designated for the course are flexible and can be completed in one school year.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials provide implementation guidance to meet variability in program design and scheduling.

Materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities. Materials provide guidance for strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental profession. Materials designated for the course are flexible and can be completed in one school year.

Evidence includes but is not limited to:

Materials support scheduling considerations and include guidance and recommendations on required time for lessons and activities.

- In the “About this Program” section, the materials provide a timeline for each section of the unit within the “CAP” pacing guide. The exact minutes (not a range) listed guide teachers in calculating lesson times based on their schedule. Guidance for the time frame for each activity is provided. A range or direct reference to adjusting these times is provided.
- The lesson pacing guide in the “About this Section” provides a thorough look at the topics covered, the time it will take to cover each topic, and which specific types of activity are included in each section. The pacing guide tells the teacher how many weeks for a chapter and how many minutes for those weeks, and then breaks down each section into minutes as well.
- The pacing guide says Lesson 4.2 should take 120 minutes. Lesson 4.2 contains a reading, a reading check, a video, and a video check. A range or direct reference to adjusting these times is provided.

Materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression.

- In the “About this Program” section, the CAP pacing guide categorizes available activities to use per section. Materials present the sections containing the activities in a logical sequence. The overview video clearly states that not all activities must be used. Implementation guidance for teachers for which activities are essential is provided by highlighting the essential activities as “author recommendations” for essential activities.

- The Lesson and Activity Pacing Guide, located in the About This Program section, provides a suggested sequence of chapters and activities that reflects the interconnections and development of conceptual understanding. Materials are organized in chapters containing lessons that are organized in a way to develop an understanding of concepts that provide support for the learning that follows in the next lessons. For example, Chapter 4, Momentum, has six lessons listed in a way that the current lesson supports the conceptual understanding of the next.
- The "About this Program" chapter contains a section called "State Science Standards." In this section, a subsection titled "Implementation" gives a visual representation through a Double Helical Model of possible progressions for content delivery. It offers guidance on how to tailor this approach to different subsets of students in a general sense, and it does offer suggestions for how to do this by color-coding specific, required activities in the pacing guide document.

Materials designated for the course are flexible and can be completed in one school year.

- The materials allow for flexibility of content delivery using the Double Helical Model from the "About this Program" section. Using this method and the available activities in each lesson, all lessons can be completed in a year using this guide and the pacing recommendations.
- The materials provide a flexible implementation, as seen in the design of the CAP (located in the "About this Program" section). In the video overview of this section, teachers are instructed that not all activities must be completed, thus allowing for flexibility. Guidance for teachers on which items to add or delete is provided. Sections containing TEKS are marked in the CAP, showing essential material as listed in 36 weeks. The materials allow for the 36-week instructional period to be flexible.
- Materials come in a virtual format that provides flexibility for implementation; for example, Chapter 5, "Work and Power," has the flexibility to assign individual lessons to a class with the use of an "Assign to Class" button located in the upper right corner of the lesson. This lesson also has the flexibility to modify the different components of the lesson by using the "Edit Lesson" button, which provides the teacher the ability to remove components of the lesson using the "Delete Card" option on each of the lesson components.

Myriad Sensors Conceptual Academy Physics

Indicator 9.1

The visual design of materials is clear and easy to understand.

1	Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.	Yes
2	Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.	Yes
3	Materials include digital components that are free of technical errors.	Yes

Not Scored

The visual design of materials is clear and easy to understand.

Materials include an appropriate amount of white space and a design that supports and does not distract from student learning. Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Materials include digital components that are free of technical errors.

Evidence includes but is not limited to:

Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.

- Materials provide an appropriate amount of white space, the flow of information is easy to process, and when students have to scroll down, they find the text easy to read, with good contrast, and free of distracting artifacts. For example, Lesson 2.6, Friction, has a good balance of content and white space and does not have distracting artifacts.
- For example, Lesson 3.2, Action and Reaction, has a good amount of white space and does not have distracting animations that don't support learning.
- Materials provide an appropriate design that supports learning. For example, in Chapter 9, materials provide prominent and clear headings, and sections are clearly marked. Subheadings have a clear hierarchy and are organized in a logical progression.

Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.

- Pictures and all visual materials are age appropriate and relevant to the learning goals. For example, Lesson 4.2, Impulse, has images that are age appropriate and relevant to the topic. The embedded video provides a mini-lesson on impulse.
- The materials have cartoon art and photographs embedded throughout the lessons. In Chapter 4, there are nine diagrams and pictures that are all age appropriate.
- In the look at phenomena in Lesson 5.4, the materials provide pictures that help with the concepts as well as pictures that help depict the “Try It and See” activity.
- In Lesson 11.2, wavelength and velocity are marked on a diagram accompanying a problem after these two factors are introduced. A pictorial of the Doppler Effect is given in Lesson 11.7 after the topic is introduced.

Myriad Sensors Conceptual Academy Physics

Materials include digital components that are free of technical errors.

- The instructional materials are digital, and all assets appear to be working fine. No broken links or errors are found after attempting to open any of the activities. For example, Lesson 1.5, Net Force, has several images and pictures, all visible without disruption. Also, the two embedded videos, “The Definition of the Newton” and “Net Force and Vectors,” play without issues.
- The materials provide PhET activities embedded directly into the lessons. In Chapter 5.5, a skate park activity is embedded into the lesson. The simulation and its buttons all function properly in the embedded activity.
- The materials have videos embedded throughout. The videos all function properly when clicked. Lesson 6.3, The Mass of Earth, has several images and pictures, all visible without disruption. The embedded video, “Constant G,” plays without issues.

Myriad Sensors Conceptual Academy Physics

Indicator 9.2

Materials are intentionally designed to engage and support student learning with the integration of digital technology.

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content.	Yes
3	Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate.	Yes
4	Materials integrate digital technology that is compatible with a variety of learning management systems.	Yes

Not Scored

Materials are intentionally designed to engage and support student learning with the integration of digital technology.

Materials integrate digital technology and tools that support student learning and engagement. Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content. Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate. Materials integrate digital technology that is compatible with a variety of learning management systems.

Evidence includes but is not limited to:

Materials integrate digital technology and tools that support student learning and engagement.

- The virtual platform integrates digital technology and tools that support student learning and engagement. For example, Lesson 5.1, Work and Power, contains digital learning assets that support student learning. These assets include a video lesson called “Force x Distance,” and several interactive assessment items. Chapter 5.6 integrates a sensor activity and two videos/video checks into the lesson. The videos are directly embedded. The activity uses a Voyager sensor for the activity to support student learning.
- The virtual platform integrates digital technology and tools that support student learning and engagement. For example, Lesson 6.1, Newton's Insights, contains digital learning assets that support student learning. These assets include a video lesson called “Universal Gravity,” a digital image illustrating the Moon's velocity vector, and several interactive assessment items.
- Chapter 5.6 integrates a PhET simulation into the lesson: “Use the following PhET simulation to analyze the conservation of momentum qualitatively for both elastic and inelastic collisions. For guided activities related to this PhET simulation.”
- Materials provide an integration of digital technology. For instance, in the “Homework Practice Sessions” in Chapter 9, a digital game is supplied to students to increase understanding and student engagement. In 9.4, materials provide a PhET simulation for Ohm's Law, which aids in increasing engagement, especially in the event that real-world scenarios may not be available.

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Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content.

- Lesson 4.1, Inertia in Motion, contains an embedded video called “Momentum,” and a digital picture providing context for real-life scenarios like the one in Figure 4.2 showing a big cargo ship in the ocean to later ask, “Why are the engines of a supertanker normally cut off 25 km from port? And why do they need tugboats to safely navigate into the port?”
- Materials integrate digital technology in ways that support student engagement with science and engineering practices and course-specific content. This integration is achieved by including interactive learning assets like video lessons and interactive assessment items. For example, Lesson 6.3 contains an embedded video called “Constant, G.”
- Materials provide integration of digital technology by providing numerous videos. For example, in 9.1, students watch a video covering Newton's Law of Universal Gravitation. In 9.4, materials provide a PhET simulation for Ohm's Law.

Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate.

- The materials offer the option for teachers to digitally assign lessons and activities. All chapters have an “assign to class” button at the top right corner of each section. The activities provided offer the opportunity for teachers to collaborate with students.
- Materials provide an opportunity for teachers to send lessons to students and for students to respond to questions, and assignments are labeled as independent or group work to show teachers which activities are meant for collaboration.

Materials integrate digital technology that is compatible with a variety of learning management systems.

- The materials are compatible with Google Classroom and Classlink. There is a tutorial available on the website that shows how teachers can link the materials to their Learning Management Systems (LMS).
- There is mention of compatibility with other LMS. For example, the PocketLab support webpage has details on how to link Google Classroom to the materials and mentions how to use the materials in conjunction with Classlink.

Myriad Sensors Conceptual Academy Physics

Indicator 9.3

Digital technology and online components are developmentally and course-appropriate and provide support for learning.

1	Digital technology and online components are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression.	Yes
2	Materials provide teacher guidance for the use of embedded technology to support and enhance student learning.	Yes
3	Materials are available to parents and caregivers to support student engagement with digital technology and online components.	Yes

Not Scored

The materials include digital technology and online components that are developmentally and course-appropriate and provide support for learning.

Digital technology and online components are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression. Materials provide teacher guidance for the use of embedded technology to support and enhance student learning. Materials are available to parents and caregivers to support student engagement with digital technology and online components.

Evidence includes but is not limited to:

Digital technology and online components are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression.

- Digital technology and online components are developmentally appropriate for the course. Digital text, pictures, graphics, and embedded videos are developmentally appropriate for the course. For example, Practice Page 2.1, Motion, contains a virtual worksheet that is developmentally appropriate.
- Lesson 3.3, Different Masses, contains a video (“Different Masses”) that is developmentally appropriate and aligns with the scope of the course. The video covers topics about mass and acceleration, which aligns with the course’s knowledge and skills progression.
- Chapter 6.5 integrates a video and a PhET simulation into the lesson. These tools help support skill progression. In this chapter, the materials introduce the concepts of potential and kinetic energy and progress to the work-energy theorem, where the simulation is used to support the learning of this concept.
- In 9.3, materials supply a PhET Simulation that is appropriate for the course; however, there is little guidance on how to use the PhET. Materials state, “For guided activities related to this PhET simulation,” so teachers need to read and select which activity to use or make their own; thus, this instruction could be in line, depending on what is chosen.

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Materials provide teacher guidance for the use of embedded technology to support and enhance student learning.

- The About this Program section lists the technology that is embedded in the form of activities. But it does not offer any guidance on using them. It only lists the types of activities and where to find them.
- Materials provide teacher guidance on the use of technology assets. For example, the instructor assessment guide document includes teacher guidance, such as timing and or instructional practices, on the use of embedded videos seen in the chapter.
- Materials provide teacher guidance on the use of technology assets. For example, Chapter 4, Newton's Third Law, includes teacher guidance on the use of embedded videos seen in the chapter. Lesson 4.2 includes a video and interactive questions, and there is teacher guidance on how to use them as a review activity in the instructor assessment guide.
- In Chapter 6.5, the materials offer a PhET simulation called “Skate Park.” The simulator itself is linked, as well as a list of activities and teacher guidance is given on how to integrate the activities into the lesson and make connections between the two.
- In 9.3, materials supply a PhET Simulation that is appropriate for the course, and guidance on how to use the PhET simulation to increase student understanding is supplied through the instructor assessment guide document.

Materials are available to parents and caregivers to support student engagement with digital technology and online components.

- In the Instructor Resources of each chapter, the materials give a Letter to Caregivers. These letters outline what to expect from each chapter, and they link to video previews contained within the chapter. For example, Chapter 5, Instructor Resources, has a Draft Letter to Parents and Caregivers that provides excerpts from the unit along with an example video lesson called “Momentum.”
- Chapter 6, Instructor Resources, has a Draft Letter to Parents and Caregivers that provides excerpts from the unit along with an example video lesson called “Machine Efficiency.” In Chapter 6.5, the materials offer a PhET simulation called “Skate Park.” The simulator itself is linked, as well as a list of activities. There is no guidance that would help a caregiver with this technology.
- In Chapters 9 and 10, materials provide a letter to parents and caregivers but do not state how it is integrated digitally. All lessons can be given to students digitally.