Summit K12 Dynamic Physics

Summit K12 Dynamic Physics 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 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 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 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 a variety of 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 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.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials are designed to strategically and systematically integrate scientific and engineering practices and course-level content as outlined in the TEKS.

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

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.

- The instructional materials examined offer a multitude of opportunities for students to hone and exhibit their mastery in scientific and engineering practices, as mandated by the TEKS. This is clearly demonstrated in "Unit 1," where students design their own investigation to ascertain the distance a car travels while the driver is texting merely three letters. Further evidence can be found in "Unit 2," where students measure and map a section of their school before calculating the displacement between their starting and ending points, reinforcing the regular application of scientific skills within lab investigations throughout the academic year.
- Furthermore, engineering practices are embedded within the materials, as seen in the "Work, Energy, and Power" unit. In this unit, an engineering project invites students to design a roller coaster to transport a marble. Additionally, a lab in the same unit allows students to collect and synthesize data using a motion detector, thereby providing multiple opportunities to develop and demonstrate engineering practices.
- Opportunities for students to master scientific concepts and engineering practices are scattered throughout the materials. In Lesson 7.2, which covers the "Conservation of Momentum," students conduct an investigation using motion carts and air tracks. Here, students make observations, gather evidence, and make predictions using varying collision configurations with

different masses and initial velocities. In Lesson 8.2, "Coulomb's Law," students engage in a virtual lab to collect and organize data using a simulation, culminating in the analysis of Coulomb's Law and the solving of numerical problems using mathematical calculations.

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.

- The materials consistently and strategically bolster students' content knowledge and skills in a manner comparable with the concept and grade level as prescribed in the TEKS. In Unit 2, "Linear Motion," students initiate their understanding of one-dimensional motion through the calculation of speed, velocity, distance, and displacement. Subsequently, in Unit 3, "Projectile Motion," these skills are expanded upon with students calculating the distance and speed of a moving projectile. The Concept Mastery section provides students with a platform to practice skills, watch educational videos, and assess their comprehension levels.
- In Unit 6, "Work, Energy, and Power," the lesson guide possesses a Teach and Discuss section, which delineates that Units 2–5 have systematically developed students' understanding of how Newton's Three Laws of Motion determine an object's acceleration. Furthermore, Unit 8, "Electrostatics," introduces a section on the "Behavior of Charged Particles," where students' previous learning experiences are strategically leveraged for the development of new content knowledge.
- The materials also sequence content knowledge and skills strategically to foster the development of students' knowledge. For instance, in Unit 7, "Circuits and Magnetism," students initially build simple circuits using either equipment or a simulation. Later lessons allow students to construct more complex series and parallel circuits to demonstrate mastery. The teacher guidance materials explain the progression of complexity in student activities and map the connections between TEKS and SEPs. In Unit 8, "Electrostatics," students kick-start Lesson 8.1, "Behavior of Charged Particles," with an Engage activity, exploring static electricity and developing models. The lesson concludes with students researching examples of static electricity to prepare a presentation and demonstration.

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.

- The materials offer plentiful opportunities, in accordance with TEKS, for students to engage in questioning, planning, and conducting various investigations and involving themselves in problem-solving activities to augment their understanding of scientific concepts. These resources incorporate a number of cross-disciplinary activities to aid in the development of conceptual understanding. For instance, in Unit 1, "Introduction to Physics," resources are available to teachers to review mathematical skills prior to embarking on graphing motion, thereby fostering conceptual comprehension in students. Moreover, the "Physics Interactives" allows students to manipulate variables for hypothesis testing. In one such Interactive, "The Moving Man," students can tweak the position, velocity, and acceleration of a model person and consequently derive conclusions from their observations.
- Units such as "Work, Energy, and Power" and "Conservation of Momentum" provide a wide array of activities that include practical demonstrations, virtual labs, and practice exercises that serve to deepen the understanding of scientific concepts. Unit 6 incorporates practical

demonstrations involving kinetic energy, and Unit 7 provides activities involving the investigation of momentum concepts through a field trip to an amusement park.

- The student materials also stimulate curiosity, encouraging students to ask questions and conduct investigations surrounding natural phenomena. For example, in Lesson 9.6, "Magnetic Fields and Electromagnetism," students can conduct an investigation using a bar magnet and a compass to explore the direction of magnetic field lines. These materials further promote the development of problem-solving skills, demonstrated by another activity in the same lesson where students apply the concepts they learned to construct an electromagnet strong enough to move a compass needle.

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 the 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.

- The materials strategically embed phenomena and problem-solving tasks across lessons, allowing for an authentic application of scientific and engineering practices in line with grade-level content and TEKS standards. For instance, in Unit 1, Linear Motion, students apply mathematical formulas to calculate speed, distance, and velocity through multiple investigative activities, which is further extended to calculate motion in two dimensions in Unit 2, Projectiles. Moreover, students engage in engineering tasks, such as designing a mousetrap car in Unit 1 and predicting the landing point of a launched projectile to knock over a tower in Unit 2.
- In Unit 7, Momentum, students utilize engineering practices in the Egg Drop Activity, building objects and enhancing their understanding of momentum. Similarly, in Unit 8, Electrostatics, students create an apparatus and make predictions on object interactions, thereby providing an authentic application of the concepts.
- Finally, the materials employ natural phenomena as the foundation for student activities, creating a tangible link between TEKS and SEP. This is exemplified in Lesson 4.4 (Applying Newton's Laws), where students develop a model for an Atwood machine and explore the connection between Newton's Laws and Free-Body-Diagrams. Real-world scenarios, like the

roller coaster design in Unit 6 (Work, Energy, and Power), are integrated into the materials to provide opportunities for demonstrating mastery.

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

- The materials strategically leverage students' prior knowledge and experiences related to scientific phenomena. In Unit 3, Lesson 3.4, students apply kinematic formulas, introduced in previous units, to calculate the distance and speed of launched projectiles. This practice builds upon foundational concepts covered in Unit 2, Linear Motion, where students begin by calculating speed, velocity, and acceleration, which is then expanded upon in Unit 4, Forces, where students explore the impact of acceleration on forces acting on an object.
- In Unit 8, Electrostatics, teachers are guided to make connections to students' prior knowledge, drawing parallels between Coulomb's law and Newton's Laws of Universal Gravitation (covered in Unit 5), further deepening the understanding of electrostatics phenomena. Similarly, Unit 6.4, Conservation of Energy, establishes relevance to previous learning experiences in IPC, where students conducted investigations providing evidence of energy conservation and then built upon that in physics.
- The materials also effectively provide opportunities for self-assessment of prior knowledge through exploratory activities. For example, in Lesson 5.2 (Circular Motion), students conduct an investigation to apply concepts of forces and develop a model for centripetal force. Furthermore, the materials offer guidance for teachers to address common misconceptions and fill knowledge gaps, such as in Lesson 10.2 (Simple Harmonic Motion), where students predict factors influencing the period of a pendulum, followed by further explanations and use of equations to demonstrate that the pendulum's period is independent of mass and amplitude.

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

- The instructional materials provide clear guidance to teachers about the scientific concepts and goals underpinning each phenomenon. In Unit 2, Linear Motion, the lesson guide emphasizes key terms and ideas by including core vocabulary boxes and resource lists for the lesson; in addition, the lesson guide includes the lesson goals and objectives for the linear motion phenomena. For example, in Unit 2, the lesson goals state, "Students will analyze different types of motion by generating and interpreting position versus time, velocity versus time, and acceleration versus time using hand graphing and real-time technology such as motion detectors, photogates, or digital applications." In Unit 4, a comprehensive outline of force-related concepts is provided, and the goals for the phenomenon of the rolling cart are listed as well. For example, the goals for the rolling cart phenomenon are "Explain and apply the concepts of equilibrium and inertia as represented by Newton's first law of motion using relevant real-world examples such as rockets, satellites, and automobile safety devices. Calculate the effect of forces on objects, including tension, friction, normal, gravity, centripetal, and applied forces, using free body diagrams and the relationship between force and acceleration as represented by Newton's second law of motion." This is the case for each lesson, outlining the goals and objectives that correlate to each phenomenon, then moving on to the emphasis on key terms and resources.
- In Unit 8.2, Electromagnetic Induction, and Unit 6.1, Work, Energy, and Power, the Teach and Discuss sections impart background knowledge about the discovery and application of

electromagnetic induction, as well as the correlation of force and displacement with the cosine function.

- Furthermore, the teacher guidance materials present a logical progression of complexity and correlation between different units and lessons. For instance, Unit 4's (Forces) study of Newton's Third Law of Motion builds into Unit 5's (Gravitation and Circular Motion) application of the same law to gravitational forces within planetary systems. Crucial background information and Science and Engineering Practices (SEP) correlations are provided, such as in Lesson 6.2, Work Changes Kinetic Energy, where teachers receive preliminary information on the work-energy theorem, preparing students for mathematical calculations (SEP P.2C) applied to work and energy problems.

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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.	M
2	Materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding.	M
3	Materials clearly and accurately present course-specific core concepts and science and engineering practices.	M
4	Mastery requirements of the materials are within the boundaries of the main concepts of the course.	M

Meets | Score 6/6

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

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

- The instructional materials demonstrate a clear commitment to connecting new learning to previous and future learning goals within and across units. As evidenced in Unit 2, Linear Motion, students' understanding of concepts such as vectors and scalars are continually expanded upon in subsequent units, such as acceleration being identified as a vector quantity in later lessons and vectors being referred to in relation to forces in Unit 4.
- Unit 6.1, Work, Energy, and Power, makes references to earlier units, such as Newton's Laws of Motion, which serves to interconnect knowledge and skills, while also presenting learning in a progressive manner from the basics to more complex concepts like conservation of energy.
- Similarly, teacher guidance materials are structured to build upon previous learning as the foundation for new concepts. This structure is well illustrated in Unit 7, where a discussion revisiting the concept of "inertia" facilitates a deeper understanding of momentum as "inertia in motion." The materials' complexity increases progressively, not only within units but across lessons too. This complexity is demonstrated in Unit 9, where students initially build a simple circuit, then apply their knowledge to build more complex parallel and series circuits, and finally analyze a combination circuit and its practical implications.

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

- Beginning with concrete demonstrations before moving on to representational and then abstract reasoning, students can engage with concepts in a hands-on and immersive way. In Unit 3, Projectiles, for example, students observe a physical demonstration, gradually build on this knowledge with calculations related to vertically and horizontally launched projectiles, and finally synthesize their understanding by calculating missing variables for combined launches.
- These learning materials carefully sequence instruction to activate or build on prior knowledge before explicit teaching occurs. This approach enhances students' ability to grasp new information, as evidenced in Unit 4, Forces, where students' understanding of motion is drawn upon to introduce changes in motion due to forces.
- In the Apply and Extend sections within units like "Work, Energy, and Power" and "Momentum and Impulse," students are exposed to a variety of activities, including articles, practice problems, and engineering projects that promote a deeper comprehension of concepts such as power and momentum.
- The materials further encourage the development of knowledge and skills through concrete, representational, and abstract reasoning stages. For instance, in Lesson 10.2, Simple Harmonic Motion, students first analyze the pendulum's motion, then connect it with a sine wave diagram, and finally employ equations to solve for variables. Similarly, in Lesson 11.1, Introduction to Electromagnetic Wave, students progress from hypothesizing about light refraction to refining their understanding of the electromagnetic spectrum through a poster creation activity.

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

- The materials in question consistently present grade-specific core concepts and practices in science and engineering in a clear, concise, and scientifically accurate manner. This structure is evident in each unit's lesson guide, which provides a comprehensive list of the standards covered in the lesson. For instance, the Linear Motion Unit Lesson Guide for Kinematics highlights several science and engineering practices (SEPs) like organizing quantitative and qualitative data, identifying model advantages and limitations, and communicating explanations in various formats.
- Scientific accuracy is maintained throughout the course materials, including the teacher's guide, student materials, and assessments. For example, in the Projectile Motion Unit, the materials accurately describe the calculation of variables for motion in two dimensions. Similarly, in Unit 8.1, Behavior of Charged Particles, specific SEPs for the unit are distinctly listed, and the Evaluate section in 8.2 provides a comprehensive list of SEPs pertinent to labs, calculations, and scientific explanations.
- Teacher guidance materials provide a clear roadmap for instruction by effectively cross-referencing concepts and SEPs. A notable instance is Lesson Guide 9.6, Magnetic Fields and Electromagnetism, which outlines the framework for activities that cover specific SEPs as students build an electromagnet. The scientific accuracy of the course is also maintained in

advanced lessons like 12.3, Quantum Properties, where students engage with complex quantum physics concepts.

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

- The materials consistently include specific learning targets for each course and clearly define the boundaries of content that students must master. For instance, in Unit 2, Linear Motion Speed vs. Velocity Lesson Guide, students are expected to differentiate between instantaneous and average speed. Similarly, Unit 7.2, Conservation of Momentum, specifies that students should understand the transfer of momentum between objects during a collision as a mastery requirement.
- The content builds upon previously learned concepts; for example, in Unit 4, Forces, students are reminded of the relationship between mass and acceleration they had learned in IPC and are guided to extend this knowledge to understand the effect of force and mass on acceleration. Likewise, Unit 5, Gravitation and Circular Motion, reinforces the concept of centripetal acceleration pointing towards the center of rotation.
- Teacher materials not only provide clear learning objectives for each lesson but also align them with TEKS. An example of this is seen in Lesson Guide 10.1, Introduction to Waves, where student learning objectives are explicitly matched with specific TEKS, such as P.8B. Furthermore, vertical alignment within lessons is emphasized to ensure content mastery, as demonstrated in Lesson Guide 11.3, Reflection and Lenses, where students conduct a “Virtual Lab” on lenses to master concepts like reflection and refraction. These practices ensure a well-structured and comprehensive learning path for students.

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.

- The instructional materials notably include guiding documents that aid teachers in understanding how the presented content connects to both previous and future learning across the course. This connection is exhibited in the Teacher Resources, where previous knowledge that students should possess is clearly correlated, such as in the "Introduction to Physics Unit."
- Materials also explain how content and concepts increase in depth and complexity across lessons and units within the grade level. For instance, in Unit 2, Linear Motion, teachers are guided in introducing motion through demonstrations and calculation practices. This foundation is then extended in the subsequent Projectiles unit by applying motion concepts in two dimensions.
- The inclusion of a vertical alignment section in units such as 6.4, Conservation of Energy, and 7.1, Momentum and Impulse, offers teachers a clear view of the previous IPC TEKS that students should have mastered, further consolidating the continuity of learning.
- Moreover, guidance materials facilitate the understanding of how new learning connects to previous and future learning within each unit. This connection is evident in Unit 10, Energy and Waves, where scaffolding, including a lesson guide and an E-poster from an IPC lesson on

Transfer of Energy by Waves, displays the skills students should have previously mastered. Detailed instructions in the materials guide teachers in conducting experiments corresponding to the concepts and skills, promoting science and engineering practices (SEPs) such as mathematical calculations in Lesson 9.2, Ohm's Law and Power.

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.

- The instructional materials furnish comprehensive background information for teachers, explaining pertinent science concepts in depth. Each unit's Lesson Guides meticulously outline all information covered in the unit, elucidating key concepts in a clear and concise manner. For example, in Unit 4, Forces, the Teach and Discuss section distinctly emphasizes that forces are external to the moving object.
- In addition to the background information, the materials proactively identify common misconceptions students may harbor about certain science concepts, thus enabling teachers to address them directly. This structure is well-exhibited in the Forces Unit Lesson Guide for Mass vs. Weight, where students are guided to understand the crucial difference between mass and weight as they relate to forces, countering their everyday understanding of these terms.
- Every unit also contains a Teach and Discuss section that equips teachers with background information and formula explanations. For instance, Unit 5.1, Universal Gravitation, elucidates the formula associated with universal gravitation, including the inverse square law, and Unit 8.2, Behavior of Charged Particles, thoroughly explains Coulomb's Law and its analogy to Newton's Law of Universal Gravitation.
- Guidance materials further enhance teachers' understanding by offering historical background and adult-level explanations of more complex course-level concepts. A noteworthy example is Lesson Guide 12.1, The Photoelectric Effect, which provides insights into Albert Einstein's contributions to the concept of the photoelectric effect. Additionally, teachers' knowledge of physics is fostered by the materials, as seen in Lesson Guide 10.3, Wave Speed, where factors affecting the velocity of a sound wave are thoroughly discussed.

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

- The materials provide a clear explanation as to why they are designed the way they are, additionally accentuating the key features of the instructional design. An illustration of this can be seen in the Teacher Resources Dynamic Physics Guide, where the materials lay out their philosophy and the guiding principles that shape the curriculum. Here, the materials underscore the importance of scientific inquiry, the role of teachers, the need for comprehensive support, differentiation, and acceleration, learning science through RLA, vocabulary mastery in context, and delivering a curriculum built for Texas.
- Moreover, the materials provide a robust rationale for their adoption of the 5E Lesson model. They firmly assert that the Dynamic Science Course aligns with all aspects of the 5E Instructional Model and that they offer teachers ample options for each step in the process. This philosophy is embedded with a belief in teacher autonomy and the potential of students to build knowledge through exploration, collaboration, and teacher guidance.

- In the Teacher's Guide, there are sections that delve into the scientific and engineering practices of the course, further elucidating the program's purpose. It also includes a Philosophy section that expounds on the purpose underlying the instructional design.
- The teacher materials underscore the rationale for employing the 5E model as the program's instructional design. Notably, the guide describes the program as interactive, hands-on, and designed to encourage productive struggle and success through multiple learning pathways. It also provides a framework elucidating the philosophy behind the program's instructional approaches, underlining the importance of students learning science through active observation, questioning, and investigation.

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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 criteria for 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 consistently support students' meaningful sensemaking through 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.

- The materials highlight the consistent presence of learning activities that encourage students' meaningful sensemaking. For instance, in Unit 2, the task of designing a mousetrap car requires students to critically analyze a problem and propose their own design solutions. In Unit 3, students analyze data and write Claim-Evidence-Reasoning (CER) statements, further promoting critical thinking. In Unit 6, students interact with text, think about scientific concepts, and write justifications as part of their learning process. Furthermore, in the Conservation of Energy section, students think like engineers as they design a roller coaster.
- In addition, the materials foster meaningful sensemaking by having students act as scientists and engineers. For example, in Lesson 11.1, students investigate various devices that use electromagnetic waves, thereby comparing and contrasting different types of light. Students must also articulate their findings in response to assigned questions, promoting critical thinking

and reflection. Similarly, Lesson 10.2 engages students in scientific investigations relating to the effects of mass, amplitude, and spring constant on the period of a harmonic oscillator. Afterward, students further engage in sensemaking by constructing CER statements about the variables that impact the period of a harmonic oscillator.

- A comprehensive example from Unit 7 has students combining reading, writing, thinking, and acting as scientists and engineers when conducting research on helmet safety in sports. This activity requires them to critically evaluate if helmets contribute to the safety of athletes and protect them from concussions.

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

- The instructional materials consistently afford students the opportunity to engage in targeted activities with scientific texts appropriate for their grade level. In Unit 4, for instance, students use pre-reading texts to aid their comprehension of scientific claim formulation before they design a lab. Further in the same unit, students read an article distinguishing between mass and weight, then synthesize their understanding by constructing a Venn diagram to compare these two concepts.
- Materials offer numerous opportunities for students to interact with grade-appropriate texts to collect evidence and deepen their understanding of concepts. This structure is exemplified in Unit 7, where students learn about real-world applications of the momentum-impulse theorem before embarking on a Mars Lander design project. Similarly, in Unit 8's Behavior of Gases section, students conduct labs on electroscopes, thereby gathering evidence and enhancing their understanding of electrostatics.
- The materials fit high school physics students, allowing them numerous opportunities to engage with scientific texts and gather evidence to strengthen their conceptual understanding. An instance of this is in Lesson 9.6, where students read an article about the history of magnets and compasses, then perform an investigation to sketch magnetic fields using a bar magnet and compass. Additionally, Lesson 12.1 introduces students to the concept of light as a particle through a reading activity, where the progression of ideas in the text prompts them to sketch energy graphs and predict photon-wave interactions. These examples underscore the consistent provision of meaningful, grade-appropriate engagements with scientific texts.

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.

- The materials consistently offer students a multitude of opportunities to articulate their understanding of scientific concepts through both written and graphical modes. For instance, in Unit 2's Linear Motion, students analyze data by crafting motion graphs from information acquired through a virtual simulation. Students then delve further into the exploration of speed, velocity, and motion graphs in a Literacy Connection in Lesson 2.3 Acceleration, where data collection and graphical representation of motion occur through another virtual simulation.
- Students demonstrate their comprehension of projectile energy in Unit 6, where they draw and label the energy of an angled projectile along its trajectory and discuss the relationships among

potential energy, kinetic energy, and mechanical energy. Further, in Unit 7, students use collision carts on an air track in the Conservation of Energy section and depict types of collisions graphically, supporting their depictions with written explanations of the interactions.

- The materials offer numerous opportunities for students to convey their thinking on scientific concepts through graphic modes by conducting investigations and compiling evidence. An instance of this is in Lesson 10.4, where students execute a virtual lab to study wave behaviors such as interference and refraction. In the process, they sketch their observations and annotate aspects of the behavior like the angle of refraction and the region of destructive interference. All these examples provide a clear testament to the ample opportunities for students to communicate their scientific understandings in both written and graphical modes.

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.

- The materials consistently offer transfer opportunities, allowing students to apply their learning in new, practical contexts. For instance, in Unit 2's Linear Motion, students collect position-time data for a bowling ball's motion down a long hallway, creating position/time graphs based on this motion. Later, these students revisit their graphs in Lesson 2.3 on Acceleration, analyzing the same data but this time through the lens of velocity vs. time graphs
- In Unit 6, Work, Energy, and Power, students are engaged in a virtual lab where they design a skate park, comparing the potential, kinetic, and total energy of a skateboarder, again reinforcing the application of learned concepts in new scenarios. The same principle is evident in Unit 9, Circuits and Magnetism, where students learn to analyze and design series and parallel circuits, then use this knowledge to study combination circuits.
- Further, the materials strongly promote authentic student engagement and encourage the perseverance of concepts through productive struggle as they take on the roles of scientists and engineers. As an example, in Unit 1's Introduction to Physics Lesson Guide, students design, test, and evaluate a paper table, gaining an understanding of the engineering design process. Similarly, in Unit 7's Momentum and Collisions, students design a landing system to cushion an egg's fall, mimicking the work of scientists and engineers in a real-world context. Finally, students engage in designing experiments based on specified criteria and outcomes, such as in Lesson 9.3, where they build a series circuit that powers multiple devices. These examples underscore the effectiveness of the materials in fostering productive struggle while reinforcing learned concepts.

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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 to 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.

- The materials consistently encourage students to employ evidence to substantiate their hypotheses and assertions. For instance, in the "Forces the Second Law Design" lab within Unit 4, students are asked to draw conclusions about their hypotheses using supporting evidence, particularly about how mass and force impact acceleration. Similarly, in the same unit's "Projectiles" segment, students explore free fall, concluding with an inquiry about how their results confirm or contradict their initial hypothesis.
- In Unit 5, titled Gravitation and Circular Motion, students are tasked with a lab experiment on circular motion using rubber stoppers and washers. This lab requires students to formulate a hypothesis, test it, and draw several conclusions. Questions about the relationship between speed and radius and comparisons between the tensions in the table and the weight of the washers are highlighted. This pattern of evidence-based reasoning continues in Unit 7's Momentum and Collisions, where students are asked to justify their assertions about momentum conservation and elasticity using evidence gathered from a virtual lab.

- The materials also facilitate opportunities for students to learn how to harness evidence in support of their claims. For instance, in the Magnetic Fields and Electromagnetism lesson, students construct an electromagnet and then use their gathered data to explain how to enhance the magnet's strength. Similarly, in the Simple Harmonic Motion lesson, students investigate a mass-spring system's motion, culminating in a Claim-Evidence-Reasoning (CER) statement explaining the factors affecting the spring period.

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

- The materials consistently offer learning experiences with new concepts, followed by opportunities to use introduced scientific vocabulary within a context. For instance, in Unit 2's Linear Motion, students observe a demonstration of speed versus velocity and then engage in discussions employing academic vocabulary and student-created definitions. A similar pattern is evident in Unit 4, Forces, Lesson 4.2, Mass vs. Weight, where a study guide requires students to define vocabulary within the context of short-answer questions backed up with evidence.
- Embedded within the materials are opportunities to develop and utilize scientific vocabulary contextually. For instance, in Unit 5's Gravitation and Circular Motion section, students partake in an activity called “Personal Definitions,” where they collaborate with a peer to formulate alternative definitions for specific terms. Furthermore, students must draw diagrams for each term and explain how each image aligns with their new definitions.
- Moreover, all lessons in the TEKS video series integrate visual content, vocabulary introduction, and reviews with interactive links leading to physics videos. Students are given multiple attempts to master vocabulary, but they must attain a minimum score of 80% to unlock further formative assessments.
- Upon completing the Introduction to Waves lesson, students have the opportunity to practice using newly acquired vocabulary by selecting the correct term from a dropdown menu to complete sentences. The same approach is visible in the Introduction to Electromagnetic Waves lesson, where students undertake a “Quick Write” activity. Here, they review an application of electromagnetism and explain its impact on modern society using terms like X-rays, radio telescopes, and microwaves.

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

- The materials effectively incorporate argumentation and discourse throughout various learning cycle stages, aiding in the development of students' content knowledge and skills. For instance, in Unit 1's Introduction to Physics, students engage in a design and build project involving a paper table. As part of the activity, each pair of students identifies one strength of their design and one area of potential improvement, promoting constructive discourse. Similarly, in Unit 2, Linear Motion, Lesson 2.2, the teacher presents a scenario of a person walking on a cruise ship. Students answer questions about the person's speed and velocity independently and subsequently discuss and defend their answers in the event of disagreement with a classmate.
- Argumentation and discourse are continually integrated throughout the materials to support the students' content knowledge and skills development. In Unit 6's Work, Energy, and Power, an activity in the Work Changes Energy section prompts students to discuss different scenarios

and decide whether work is being done. Students are required to justify their answers. Similarly, Unit 8's Electrostatics section presents an investigation named "How to Charge Objects Performance Task." In this task, students write a procedure, make a claim, and present reasoning on the type of charge transfers that occurred in their demonstration, subsequently inviting questions from other students.

- Opportunities for students to engage in argumentation and discourse are provided consistently, helping them refine their content knowledge and skills. For example, the Introduction to Circuits lesson encourages students to use newly acquired vocabulary during a class discussion to argue whether air functions as a conductor or an insulator. Similarly, in the Quantum Properties lesson, an activity prompts students to collaboratively research and argue opposing viewpoints on the wave-particle duality of light, encouraging active discourse.

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.

- The instructional materials consistently offer guidance on how to construct and present verbal and written arguments using evidence gathered from learning experiences. For instance, in Unit 4, Forces, Applying Newton's Laws, students conduct research on STEM careers necessitating an understanding of forces and motion and subsequently present their research using the evidence collected. Moreover, Unit 1's Introduction to Physics section encourages students to design an experiment exploring the potential hazards of texting while driving. They're required to provide a conclusion where they justify their argument concerning the dangers of texting and driving.

- The materials also present opportunities for students to build and present age-appropriate written and verbal arguments that validate explanations of phenomena and problem solutions. In Unit 7's Momentum and Collisions, students predict the outcome of a collision between two carts, observe the event, draw conclusions, and develop equations for elastic and perfectly inelastic collisions. Another example comes from Unit 6's Work, Energy, and Power, where a roller coaster Engineering Design Project is introduced. In this project, students conduct research, design, and construct a roller coaster in groups, perform energy calculations, and present their work to the class, justifying their design.

- The materials further provide criteria for formulating age-appropriate arguments to explain phenomena, utilizing evidence acquired from learning experiences. For instance, the Magnetic Fields and Electromagnetism lesson features an activity where students compare hypotheses, laws, and theories to consider the status of Maxwell's Laws, concluding with a written statement to explain their findings. In another activity within the Electromagnetic Spectrum lesson, students respond to questions related to electromagnetic waves, including the description of the mathematical relationship among wave descriptors, thus justifying their explanations using written arguments.

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

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials provide 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 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.

- The materials provide ample teacher guidance on anticipating student responses and leveraging questioning to deepen student thinking. For instance, in Unit 3's Projectiles and Unit 5's Gravitation and Circular Motion, teachers are given potential answers to activity analysis sections, along with key questions for discussions. These questions, such as those listed in the "Vertically Launched Projectiles" activity, are accompanied by predictions of common student responses and suggestions for guiding student understanding toward core concepts, such as the constant acceleration due to gravity.
- Similarly, the activity "Scientific Notation and Law of Universal Gravitation Examples" provides expected student answers along with how to solve the problems and relevant background information. In the Work, Energy, and Power unit, the materials foresee potential student answers and propose ways to expand student thinking in the "Is Work Being Done" activity.
- The Introduction to Circuits lesson and Simple Harmonic Motion lesson further illustrate the pattern of including potential student choices and responses in the Teacher Notes section. The materials also suggest probing questions for teachers to ask, thereby encouraging deeper student engagement and understanding of the topics at hand.

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

- The instructional materials provide comprehensive teacher guidance on scaffolding and supporting students' development and application of scientific vocabulary in context. In Unit 2's Linear Motion and Unit 4, the Key Concepts section and lesson guides present vocabulary definitions while emphasizing nuances, such as the differentiation between "scalar" and "vector," guiding students toward accurate conceptions. This guidance includes clarification that distance and displacement are distinct concepts and that external forces lead to changes in an object's motion.
- Similarly, Unit 7's Momentum and Collisions offers scaffolding through activities that engage students with terms like "scalar" and "vector" in a contextually meaningful way. This practice of using, defining, and distinguishing between terms is extended to the Electrostatics unit, where students are required to utilize what they have learned about charges in practical tasks using relevant vocabulary.
- Moreover, lessons such as the Introduction to Electromagnetic Waves and Quantum Properties lessons offer explicit instructions to teachers to aid students in their understanding and retention of the scientific lexicon. The materials thus provide an embedded system for teachers to scaffold students' vocabulary development, equipping students with tools to express their understanding of scientific concepts accurately.

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

- The materials provide comprehensive teacher guidance on preparing for student discourse and encourage students to use evidence to construct written and verbal claims. For instance, in Unit 4's Forces, teachers are prompted to foster an environment of discourse by encouraging students to share their reasoning and actively seek feedback from classmates. This approach extends to resources such as the Using Evidence to Communicate Findings section, which offers guidance for teachers on a variety of settings for presenting information.
- In Unit 8's Electrostatics and Unit 6's Work, Energy, and Power, students collect data and then utilize it as evidence to justify their answers, with teachers receiving specific guidance on how to explain complex concepts like electric fields and kinetic energy to bolster student reasoning. The expectation of constructing Claim-Evidence-Reasoning (CER) statements encourages students to use their collected data and theoretical understanding to express coherent arguments.
- Furthermore, the materials provide ample support for teachers to facilitate student discourse. In lessons like Quantum Properties and Wave Speed, students engage in debates on challenging concepts, such as the wave-particle duality of light, or analyze scientific data such as seismograms. Teachers are guided to stimulate these conversations through a variety of prompts and techniques, such as asking students to retell information or posing baseline questions for discussions. This technique ensures that students are not only prepared for discourse but can effectively use evidence in constructing their claims.

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

- The materials provide a robust framework to support and guide teachers in facilitating the sharing of students' thinking and finding solutions. In lessons such as Unit 1's Introduction to Physics and Unit 2's Linear Motion, teachers are given specific guidance on facilitating engineering design challenges and encouraging students to develop and share their understanding of concepts like E-Posters. These instructions allow students to enhance their comprehension and demonstrate their learning by sharing responses and reasoning behind their answers.
- In Unit 6's Work, Energy, and Power and Unit 7's Momentum and Collisions, students are encouraged to work in groups, facilitating the sharing of students' thinking and collaboratively finding solutions. For instance, during the “Work and Power on the Stairs” investigation or when building a protective device for an “astronaut” (egg), students are guided to reach a consensus on the best solution to the tasks at hand.
- Similarly, the materials provide examples to guide teachers in facilitating the verbal expression of students' thought processes. In lessons on topics such as the index of refraction or Ohm's Law, teachers are directed to stimulate discussions among students and encourage them to compare their work with classmates, pointing out differences and rectifying errors before presenting the correct schematic diagrams or concepts. This process fosters a collaborative learning environment where students learn from each other, enhancing their understanding of the subject.

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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 criteria 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.

- The provided instructional materials offer a mix of diagnostic, formative, and summative assessments in diverse formats, providing valuable opportunities for teachers to monitor student progress and adapt their instructional strategies accordingly. Examples of such formats include activities where students create stories based on position-time graphs, which serve as informal assessments, allowing teachers to gauge their ability to match graphs to motion.
- Formative assessments within the materials exist in a variety of forms, further enhancing their capacity to measure student learning. For example, the “Introduction to Circuits” lesson in the Evaluate section integrates formative assessments using drag-and-drop formats, offering an interactive and varied method to assess student understanding. Additionally, the instructional materials also contain numerous formative assessments within each section of the units available via the Concept Mastery link.
- Moreover, the materials offer other avenues for assessing student learning, such as the Science Literacy Vocabulary Mastery under Teacher Resources, allowing for the evaluation of vocabulary understanding within specific sections of a unit. Similarly, the “Simple Harmonic Motion” lesson guide features an “Evaluate” component for vocabulary review, demonstrating an additional method to assess understanding informally.

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

- The instructional materials sufficiently assess all student expectations and clearly indicate which expectations are being evaluated in alignment with the Texas Essential Knowledge and Skills (TEKS). For instance, under “Concept Mastery,” each lesson integrates two formative assessments. In the context of Unit 3, Projectiles, Lesson 3.2, the formative assessment covers TEKS P.5A and P.5C. Similar examples can be found in Unit 6's Work, Energy, and Power and Unit 8, Electrostatics, with formative assessments covering various TEKS standards.
- These materials come with a comprehensive scope and sequence outlining the TEKS to be covered within the course. This resource can be accessed via the “Dynamic Physics Teacher's Guide,” which provides a link showing TEKS addressed in each lesson. The detailed scope and sequence extends to all lessons, such as the “Introduction to Electromagnetic Waves” lesson correlated with TEKS P.8(E).
- Moreover, the materials provide not only the TEKS correlation for each assessment item but also the corresponding answer keys. An example of this can be found within the “Teach and Discuss” section of the “Photoelectric Effect” lesson, which correlates with TEKS P.9(A). It includes an assignment dealing with the particle nature of light, and teachers can readily access the assignment's answers.

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

- The instructional materials under consideration include assessments that proficiently integrate scientific concepts and science and engineering practices. For example, in Unit 2's Linear Motion, students are tasked with designing and building a mousetrap car for a competition, thereby embodying design and engineering practices. This mousetrap car is then repurposed in Unit 4 during the exploration of forces. However, while the “Concept Mastery’ formative assessments are generally coded for the science concept they assess, they lack individually coded questions correlating the specific TEKS for Science and Engineering Practices (SEPs) to the question.
- Further resources, such as the Scientific and Engineering Practices link within Teacher Resources, provide assessments covering each of the SEPs. This information, along with the TEKS covered in each lesson, is made available in the “Dynamic Physics Teacher's Guide.” Each activity within the lesson guide also indicates the corresponding Scientific and Engineering Practices.
- Assessments often require students to integrate their scientific knowledge with science and engineering practices. This structure is evident in the “Combination Circuits” and “Wave Behaviors” lessons, where students engage in practical activities like predicting circuit brightness and investigating the Doppler effect, respectively. These activities clearly correlate with various SEPs, as shown in the lesson guide.

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

- The instructional materials provide assessments that require students to apply their knowledge and skills to novel contexts, thereby fostering critical thinking and adaptability. An example of this application occurs in Unit 1, Lesson 1, where students are tasked with building a table out of sheets of paper, serving as an initial assessment of the design and engineering skills being introduced. Another example resides in Unit 3's Projectiles, Lesson 3.4, where students assess their conceptual understanding of projectile distance in the “Angle-Launched Projectiles Conceptual Practice” document.

- Similarly, Unit 6, Work, Energy, and Power's section on the Conservation of Energy incorporates an activity where students use simulations to understand kinetic and potential energy as well as total mechanical energy in a virtual skate park. Students then create their own skatepark using the knowledge they've gained. This utilization of knowledge also happens in Unit 7's Momentum and Collisions, where students analyze elastic and inelastic collisions in the “Air Track Virtual Lab” activity, thereby applying the law of conservation of momentum which they've learned during the unit.
- Assessments within the materials also encourage students to apply their knowledge to new phenomena or problems. In the Wave Behaviors lesson, for instance, students are presented with different sections demonstrating phenomena related to reflection, refraction, diffraction, and resonance. After visiting all the stations, students must discuss the wave behaviors they observed and identify which behaviors were exhibited at each station. Furthermore, in the Magnetic Fields and Electromagnetism lesson, students sketch the magnetic field around a bar magnet using a compass and then explain how a magnetic field influences the direction of a compass.

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. 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 some 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 provide a variety of resources and some 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 materials under review provide information and resources that guide teachers in evaluating student responses. For instance, in Unit 3's Projectiles, Lesson 3.2, the "Vertically Launched Projectiles Graphing Activity" incorporates a key to verify student responses. Similarly, Unit 2's Linear Motion, Lesson 2.3, titled "Bowling Ball Investigation, Revisited," provides sample student responses to the discussion questions to facilitate evaluation.
- In Unit 7, Momentum and Collisions, the section on Conservation of Momentum includes an activity named "INVESTIGATION – Conservation of Momentum." This activity features a key that offers possible answers, thus aiding teachers in student evaluation. Additionally, Unit 8, Electrostatics' section on Behavior of Particles includes an activity with a key to assist teachers in assessing student work.
- Finally, in the "Apply and Extend" sections of the "Magnetic Fields and Electromagnetism" and "Quantum Physics" lessons, teachers are guided on evaluating student responses through detailed grading criteria and correct answers. In the first lesson, students research electromagnetism applications and prepare a presentation, which is graded based on specific criteria. In the second lesson, students complete a Venn diagram to show differences and similarities between the superposition of quantum states and wave-particle duality of light, and

the teacher document provides correct answers and a thorough explanation of what the conclusion should include to facilitate grading.

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.

- The materials provide support for teachers' analysis of assessment data, along with some guidance to respond to individual student needs. For example, in the Teacher's Guide, under the "Teaching and Learning" section, support for viewing reports and dashboards isprovided, and there is a training document provided to aid teachers in understanding the reports and using the reports for data-driven instruction. Similarly, on the Concept Mastery Page, a link is provided to view reports for completed assessments and vocabulary mastery.
- The Dynamics Physics Teacher's Guide includes reports on assessment data for teachers, such as video viewing reports, content mastery reports, vocabulary mastery reports, science literacy reports, and lab investigation video reports. These reports support teachers in instructional planning by allowing them to respond to the needs of the students based on instructional data. Nonetheless, the Vocabulary Mastery link includes a reports section that allows teachers to assess student progress.
- The materials also aim to offer guidance and tools to help teachers respond to data to inform instruction. Teachers can access reports to view individual student performance in "Concept Master" and "Vocabulary Mastery" assessments, as well as usage. There is a training document provided for teachers to view that gives guidance on how to respond to student needs based on the data provided in the reports.

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

- The materials include assessment tools that produce relevant information, helping teachers with instructional planning, intervention, and extension activities. For instance, Concept Mastery formative assessments are presented as a means to identify students in need of additional support during the unit. Vertically aligned lessons from previous courses are provided as further intervention options. Should a student struggle with topics like the "Speed vs Velocity" Lesson in Unit 2, Linear Motion, or Unit 6.4, Conservation of Energy, in Work, Energy, and Power, they can be assigned relevant lessons such as "Velocity," "Speed vs Velocity," or the IPC.6C section of Conservation of Energy to solidify understanding before progressing.
- Moreover, the "Vocabulary Mastery" materials are highlighted as a tool that generates results, aiding teachers in decision-making for student intervention and acceleration. Similarly, if students don't achieve at least an 80% score on the "Vocabulary" section, the materials guide teachers to consider offering a vertically aligned assessment as a scaffold for mastering key concepts.
- Furthermore, the materials propose strategies for instructional decisions, such as forming groups based on the concepts and skills that need to be retaught or remastered. In the "Apply and Extend" section of the "Combination Circuits" lesson, teachers are provided with two practice activities. The more in-depth activity, "Practice - Combination Circuits, Full Analysis," is suggested for advanced students, aiding in the grouping process.

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

- The materials provide a plethora of resources and teacher guidance on how to use various activities in response to student performance data. For example, Unit 4, Forces, Lesson 4.1, includes an “Apply and Extend” section comprising three distinct activities that target different parts of the lesson, allowing for assignments based on student needs. This structure is echoed in Unit 5, Gravitation and Circular Motion, where the Circular Motion section has two activities that offer guidance on simple activities to comprehend centripetal force and acceleration.
- Moreover, the Concept Mastery” section on the website includes a “TEKS Video” activity, which provides reteaching of concepts to students needing intervention on content. This method is also used following “Formative Assessment 1” within the “Reflection and Mirrors” lesson, wherein a “TEKS Video” helps visualize key concepts and set objectives. The activities respond to student data, but there is no explicit guidance on how to leverage these activities to respond to that student data.
- Additionally, certain units offer multiple options for teachers to enhance student knowledge based on their performance data. Unit 6, Work, Energy, and Power, for instance, enables students to readdress word problems associated with the unit's topics and revisit lab opportunities using roller coasters. Similarly, the “Wave Speed'” lesson provides direct teaching activities, a study guide, and an e-Poster to assist teachers in leveraging student performance. While there are embedded questions teachers can choose to use, there is no explicit teacher guidance on using these videos to respond to student data.

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.

- The materials contain formative and summative assessments that are both scientifically accurate and well-aligned with taught objectives. For instance, the Projectiles Unit appropriately assesses that the acceleration of a projectile remains constant throughout free fall. Furthermore, the formative assessments are verified to be free from calculation errors, such as the correct calculation of forces acting on objects in the Forces Unit.
- Assessments are noted to be unbiased and error-free. As an example, the assessment for Universal Gravitation in Concept Mastery accurately uses correct terms and images. Additionally, the Work Changes Kinetic Energy assessment under the Work, Energy, and Power unit is confirmed to be free from errors in questions involving mathematical concepts and data tables.
- The same level of accuracy is noted in Formative Assessment 2 for the “Introduction to Electromagnetic Waves” lesson. Here, “Radio Wave” is correctly identified as having the lowest frequency among listed electromagnetic waves. Finally, the “Wave Speed Calculations” assessment from the “Wave Speed” lesson contains error-free items, as validated by the correct answer provided in the answer key for a question concerning the frequency of a wave.

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

- The assessment tools utilized in the materials contain clear pictures and graphics, and these are developmentally appropriate.

- The Linear Motion Speed vs Velocity Formative assessment is highlighted for its use of a comprehensible diagram illustrating a person's day-long journey, aiding students in calculating the speed of travel between two points. Likewise, the Mass vs Weight Formative Assessment makes use of suitable diagrams to demonstrate forces acting on various objects, ensuring the material remains level-appropriate.
- The Conservation of Energy assessment within the Work, Energy, and Power Content Mastery section is commended for its use of developmentally appropriate pictures of rollercoasters and data tables. Additionally, the Conservation of Momentum assessment in the Momentum and Collisions section incorporates suitable diagrams for collisions and graphics for other objects.
- In a similar fashion, the “Formative Assessment 1” for the “Introduction to Waves” lesson presents a clear image of a wave, effectively displaying the wave's amplitude as the distance from the zero-meter line to the wave's crest. Moreover, the “Vocabulary Assessment” for the “Quantum Properties” lesson is praised for its age-appropriate depiction of the photoelectric effect through an image of photons colliding with a metal sheet and thus emitting electrons.

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

- The materials provide guidance to ensure consistent and accurate administration of assessment tools. For instance, the Lesson Guide for the Freefall Lesson in the Projectile Unit reminds teachers to assess students at the end of the unit using formative assessments. Similarly, within the Universal Gravitation and Circular Motion unit, teachers are guided to use Summit for student learning mastery and assessment of understanding.
- The “Evaluate” section in the “Wave Behaviors” lesson guide also directs teachers to have students assess their understanding through a variety of assessments.
- The materials contain detailed information that bolsters the teacher's understanding of assessment tools and their scoring procedures. The formative assessment for Unit 2, Linear Motion, Lesson 2.3, Acceleration, for example, grades students' assessments in real-time and provides data reports on student responses. Similarly, in the Electrostatics unit, teachers have various options to guide students through either Assessment 1 or 2 or review the unit through vocabulary review or videos. Finally, the teacher's guide includes a Concept Mastery section, providing an overview of the different types of formative assessment and the scores required to progress.

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 include guidance to offer accommodations for assessment tools, enabling students to demonstrate mastery of knowledge and skills aligned with learning goals. For instance, Unit 4, Forces, Formative Assessment 2 for Lesson 4.1, Newton's Laws provides various student supports, such as highlighting, strikethrough, and reading assistance that can be activated by the teacher.
- Similarly, the Teacher's Resources under the course design includes instructions for adjusting the text size, reversing the contrast of the backgrounds, enabling Braille mode, and activating text-to-speech accommodations for students. The “Formative Assessment 1” for the “Simple Harmonic Motion” lesson also includes a text-to-speech feature on the web-based assessment platform.
- In addition, the materials offer accommodations for students. The Concept Mastery section's TEKS videos, for example, allow students to activate closed captioning as needed, with

reminders to teachers that students can rewatch the videos if necessary. Similarly, in Unit 7, Momentum and Collisions, all TEKS videos have a closed captioning button to support students in comprehending the video content.

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 criteria 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 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.

- The materials consistently offer additional lessons for targeted instruction, encompassing differentiated instructional approaches to support the diverse learning needs of students. In Unit 2, Linear Motion, lessons are linked with the TEKS that vertically align, offering additional support for students striving for mastery. This structure includes a lesson correlated to IPC TEKS containing content about speed, specifically designed to aid students in this area.
- Similarly, in Unit 6, Work, Energy, and Power, the materials include a link to IPC.6C on Conservation of Energy to assist students struggling to master this concept. The activities based on Integrated Physics (IP) are vertically aligned with the Physics concepts of Conservation of Energy, providing a comprehensive learning path.
- The Concept Mastery section is another crucial feature of the materials, housing resources such as videos, vocabulary activities, and assessments that allow students to review, practice, and validate their understanding of content. The materials also provide scaffolds for instruction based on specific areas where students may be having difficulties, such as series and parallel circuits, offering additional opportunities for mastery.
- Finally, the materials clarify vocabulary and symbols to further support content mastery, as evident in lessons like Wave Behaviors, where students engage in vocabulary activities by completing sentences using the correct term from dropdown options, enhancing their grasp of the subject matter. These elements collectively reinforce the materials' commitment to differentiated instruction and targeted support for student mastery.

Summit K12 Dynamic Physics

Materials provide enrichment activities for all levels of learners.

- The materials consistently provide enrichment activities that account for learner variability, fostering in-depth understanding and exploration of scientific concepts. For example, Unit 3's Projectiles lesson includes a section to Apply and Extend, allowing students to practice graphing and calculating variables for vertically launched projectiles. Students are further encouraged to collect data from a real-world scenario, such as throwing a ball into the air and calculating its speed and height.
- The enrichment activities provided by the materials extend beyond traditional lessons, offering students hands-on experiences with scientific phenomena. Virtual labs and simulations feature prominently in these materials, allowing students to manipulate variables and observe the effects of their actions. Unit 4, Forces, Lesson 4.1, incorporates a PhET virtual lab that enables students to change the force and mass of objects to observe changes in acceleration.
- Unit 7, Momentum and Collision, includes an Apply and Extend section that offers enrichment opportunities, such as predicting outcomes of collision cart interactions and additional investigations and practice sets. Similarly, in Unit 9, Circuits and Magnetism, learners have additional investigations and practice sets for extension beyond the understanding of series and parallel circuits.
- The materials go beyond simple textbook knowledge, facilitating discussions and model usage to stimulate a deeper understanding of physics. For instance, the “Simple Harmonic Motion” lesson encourages students to debate the variables that would affect a pendulum's period, followed by an investigative activity where they test their predictions using a pendulum. These lesson guides also offer engaging enrichment activities like reading scientific articles and watching TED talks to further explore science. The Apply and Extend section of the “Quantum Properties” lesson involves activities centered on a TED talk about visible quantum objects and the reading of articles on quantum phenomena, encouraging student engagement and facilitating a deeper understanding of the content.

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

- The materials under review support students by integrating just-in-time scaffolds that cultivate perseverance in learning and understanding complex concepts. For instance, in Unit 2, Linear Motion, Lesson 2.4, Kinematics, students who may struggle with algebra skills are offered scaffolds that suggest ways to organize information from word problems. Similarly, Unit 9's Circuits and Magnetism offers scaffolding that builds on previous knowledge. Here, the concept of power from Unit 6 is reintroduced and further developed, linking it to electricity and manipulating formulas accordingly.
- For students who exhibit a stronger grasp of the material and are ready for accelerated learning, the instructional materials provide appropriate challenges. An example is in Unit 4, Forces, Lesson 4.4, Applying Newton's Laws, where advanced students can engage in an investigation involving the solving of simultaneous equations, requiring a comprehensive understanding of free-body diagrams. Similarly, the “Refraction and Lenses” lesson guide includes activities, such as a problem set about Snell's Law and a career exploration project that helps advance their understanding of optics.
- The materials also ensure that cognitive demand remains high while providing teachers with the tools to re-engage students who may struggle with specific tasks. This is demonstrated in the “Ohm's Law and Power” lesson, where teachers can utilize a water analogy to explain the concept of resistance, preparing students for an activity with resistors.

Summit K12 Dynamic 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 instructional materials being analyzed engage students in the mastery of content through a variety of instructional approaches. Each unit starts with a section designed to establish relevance for students, followed by teacher-led demonstrations, student-led investigations, and opportunities to make literary and mathematical connections. One example is in Unit 2, Linear Motion, Lesson 2.3, Acceleration, where students investigate the effects of initial position, velocity, and acceleration on motion using a virtual lab simulation.
- Materials are found to be developmentally appropriate and provide a range of activities to foster engagement and learning. In Unit 8, Electrostatics, the Behavior of a Charged Particle section offers multiple activities, including analogies, hands-on laboratory activities, virtual labs, and practice using formulas. Similarly, Unit 7's Momentum and Collisions section incorporates demonstrations, discussions, research opportunities, hands-on activities, engineering design projects, and problem practices to ensure comprehensive understanding.
- In addition to the variety of activities, the materials make use of multimedia resources, such as video clips, to introduce and reinforce science concepts. An example of this is in the “Photoelectric Effect” lesson, where a video is utilized to teach students about photons, energy,

and the photoelectric effect. Additionally, the materials provide classroom demonstrations, like the one in the "Introduction to Electromagnetic Waves" lesson, where light refracts through a prism to show the various colors of visible light.

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

- The instructional materials consistently support flexible grouping, offering a variety of learning contexts to accommodate different student needs and classroom dynamics. Unit 3, Projectiles, Lesson 3.1, Freefall, exemplifies this with an initial whole-group demonstration and class discussion about what defines a projectile. Following this, students work independently on calculations using freefall equations and then engage in group work to determine an object's freefall acceleration using the slow-motion capabilities of a camera phone. Similarly, Unit 4, Forces, Lesson 4.3, Types of Forces and Free Body Diagrams, begins with a whole-group demonstration, followed by independent reading, and then group discussion.
- Materials also offer a variety of grouping opportunities in Unit 7's Momentum and Collisions and Unit 6's Work, Energy, and Power sections, allowing for whole-group, small-group, or individual activities based on the complexity and nature of the task. For example, "Momentum and Inertia" can be a whole-group or small-group discussion, and "Impulse Units" can be done individually or in small groups. At the same time, the "Mars Lander" project and "Conservation of Energy" activities are best suited for small groups.
- Beyond flexibility in grouping, the materials also provide guidance for teachers on when and how to use specific grouping structures based on the needs of the students. The Introduction to Circuits lesson guide, for example, instructs teachers to arrange materials per group for a particular activity. Similarly, the "Simple Harmonic Motion" lesson suggests a sequence where students answer questions individually before breaking into groups for further discussion.

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

- The instructional materials provide multiple types of practices, effectively catering to diverse learning styles and ensuring a comprehensive understanding of the content. For instance, Unit 4's Forces, Lesson 4.1 on Newton's Laws begins with a teacher-led demonstration, incorporating guiding questions to stimulate student discussions. Similarly, in Unit 2's Linear Motion, Lesson 2.4 on Kinematics, the materials offer example problems with a key, assisting teachers in guiding students on calculating variables in kinematic equations.
- Materials demonstrate a rich variety of practices across different units. In Unit 6's Work, Energy, and Power section, students encounter demonstrations, virtual labs, practices, and engineering design projects. The Conservation of Energy section, in particular, offers varied learning activities such as the "Energy of a Marker" demonstration and the "Roller Coaster" engineering design project. Similarly, Unit 5's Gravitation and Circular Motion section presents a range of practices for student engagement, including investigations and demonstrations.
- The materials extend beyond providing diverse practices to include teacher modeling opportunities, ensuring students grasp not just the what but also the how of learning. The "Introduction to Waves Lesson," for instance, instructs teachers on assisting students in visualizing wave dynamics using a coiled spring toy. Furthermore, the materials enhance the effective implementation of these practices by stating clear lesson goals. For example, the "Atomic Spectra" and "Image Formation" lessons clearly outline what students are expected to achieve, such as describing image formation due to reflection or refraction.

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

- The materials consistently showcase diverse communities through respectful and inclusive images and information. This diversity is evident in the vocabulary practices under the Content Mastery Section, where images of multiple genders and ethnicities are employed to represent the vocabulary words. A similar approach is taken in the Scientific and Engineering Practices Section within the skills companion, where images depict individuals of various ethnicities and genders.
- This trend of inclusivity extends across different units. For instance, Unit 5's Gravitational and Circular Motion section and Unit 8's Electrostatics use a diversity of names and images, encompassing various ethnicities and genders within the problems and PowerPoint presentations.
- Moreover, the materials take care to represent diversity in specific lessons as well. The “Vocabulary Mastery” section for the “Introduction to Electromagnetic Waves” lesson showcases a female student, a female medical patient, and a male gamma-ray technician. In an effort to further promote diversity, the Scientific and Engineering Practices section includes investigations of STEM careers that highlight images of both male and female scientists of different heritages working in lab settings, as well as female scientists at a construction site.

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

Meets | Score 2/2

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

Materials 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.

- The Teacher's Guide in the resources contains links for a guide to ELPS implementation. This document contains guidance and activities for teachers to use to support emergent bilingual students. An example of this is the "Applying Previous Experiences" page, where the document states, "Many successful learners realize that we understand more when we connect a new idea to something we already know. This 'sticky learning' does not always come automatically; many students need to be taught explicitly how to connect meaning, especially between academic fields and real-world experiences. We must both model this process during instruction and teach students how to make meaningful connections independently." This guidance is helpful to teachers with students that need language support, aligns with the ELPS, and provides verbiage to say to students during a lesson as well as an aligned activity. For example, one activity states, "In this activity, you will model for students the process of thinking aloud and then have them practice this technique with partners or in groups. To begin, take a difficult passage associated with the content you are covering. Read it aloud, then discuss with the class how you can connect this material to a prior experience of your own." The materials continually provide guidance for each ELPS-aligned activity in the implementation guide. Additionally, while the Vocabulary Mastery section on the website does include images and audio for vocabulary, these elements are adjustable to meet diverse learner needs.
- Further, guidance is provided for linguistic accommodations matching differing levels of English language proficiency as defined by the ELPS in the Newcomer Resources, which contains a guide on how to accommodate students that are new to the state or country. There are resources for

multiple languages, including but not limited to Spanish, Farsi, Korean, and Mandarin. There are also resources for students that do not speak English at all and need foundational skills. However, in Unit 6, Work, Energy, and Power, a Literacy Connection called “Is Work Being Done?” integrates language learning with content. As students work together to sort cards, teachers monitor oral language production, prompting students to repeat, rephrase ideas, articulate different sounds, and learn and use new vocabulary while explaining their reasoning.

- The materials also supply teacher guidance to communicate effectively with English learners, aiming to generate comprehensible input. In the Teacher's Guide, a section titled “K12 ELPS Teacher Support” is available. This section offers guidance and suggested activities for implementing ELPS within various topics. One example of such an activity is the Metacognition Activity, which reads, “At the beginning of a new section or chapter, assign each student a section of text that explains a concept. Ask the students to think about what they already know about the concept and encourage them to review earlier passages in the text that help them understand the passage. They then can explain in writing and sketches what they understand about the concept. After they have finished this step, have them work with a partner, switching terms and discussing both the content and the previous knowledge they applied to it. As a culminating activity, students can make a poster illustrating and/or explaining the concept. These posters can become part of a class bulletin board or unit map. For instance, you might separate a bulletin board into two areas, labeling one ‘simple machines’ and the other ‘complex machines.’ As you study the text, students add their own text and illustrations to complete the board, gaining an understanding of what makes a machine simple or complex and the relationships between them.” The materials also propose the usage of graphic organizers to sort information, sequence steps in a process, or scaffold writing tasks. These tools can be found on the “Teacher Resources” page under Graphic Organizers.

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

- The instructional materials encompass resources that support accommodations for learners, including the “Newcomer Resources” and “Science Literacy” within the Teacher's Guide. The “Newcomer Resources” contain multiple resources and guidance on how to support the development of their academic English. Exercises such as reading sentences or passages in their native language first and then English, as well as learning academic vocabulary in their first language before learning the English version of the words, are included in the guide. In Unit 3's Projectiles Lesson 3.3, the “Personal Definitions” Literacy Connections activity prompts students to brainstorm with a partner to expand their language, reinforcing the strategic use of their native language for learning.
- Further, the materials promote strategic usage of students' first language as a tool for linguistic, affective, cognitive, and academic development in English. The Vocabulary Mastery section of the Teacher's Resource guide associates images with vocabulary words and provides Spanish equivalents for each term, demonstrating the usage of bilingual resources. Similarly, Unit 7's Momentum and Collisions section encourages students to maintain a personal dictionary with new vocabulary, expressions, and language structures, enabling the incorporation of their first language in learning new language structures.
- In addition to these, the materials include family letters detailing instructional objectives in languages other than English, enhancing the involvement of diverse linguistic backgrounds in learning. Specifically, the Teacher's Guide hosts a “Parent/Guardian Letters” section, providing an option for English and Spanish communications.

Summit K12 Dynamic 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 criteria 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 materials actively provide essential information that can be shared with students and caregivers about the design of the program. Notably, the Dynamic Physics Teacher Guide includes parent letters, which can be sent home to introduce caregivers to the program. Similarly, the Teacher's Guide, in its Additional Resources section, features a link to a parent letter where teachers can explain the design of the Summit program to parents.
- In addition to informing caregivers, the materials also cater directly to students. The Teacher's Guide provides a document called "Student--Getting Started," a resource designed to aid students in navigating the materials. This guidance is further extended via a "Student Getting Started" link found under the Additional Resources section in the Teacher's Guide, designed to help both students and their caregivers understand the program better.
- Finally, the "Teacher's Guide" incorporates an orientation document to effectively guide students in navigating the Learning Management System (LMS) and understanding the various elements within lessons. The guide also elucidates how the 5E Instructional model is embedded within the course design, thus providing a comprehensive overview of the program's pedagogical approach.

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

- The materials robustly provide information to be shared with caregivers to facilitate their involvement in reinforcing student learning and development. In the Teacher's Guide, the document "Home to School Connection" is specifically designed to aid caregivers in supporting their child's learning for each of the TEKS. This document highlights key concepts associated with each TEK, providing caregivers with a focused understanding of what is being taught.

- Under the Additional Resources section of the Teacher's Guide, a Home to School link leads to content that equips caregivers with key points and activities they can engage in with their children at home. For instance, in Unit 5's section, caregivers are guided to watch a video about the orbiting planets with their child and discuss related queries, such as what causes the planets to orbit the sun and why the Earth orbits faster than Neptune.
- Similarly, for Unit 7.2, the Work Changes Kinetic Energy section, an activity involves watching a YouTube video about a garage door being operated by a mechanical opener, with discussion prompts focused on identifying where the work is being done and how that work transforms into kinetic energy.
- In addition, the materials offer at-home activities for caregivers. For instance, within the “Home to School Connection” documents, a one-page handout about the Quantum Properties lesson includes an engaging activity about the impossibility of teleportation.
- Lastly, the Teacher's Guide presents a “Parent/Caregiver Letter” that outlines the LMS's functionalities and the course design, enabling caregivers to better understand and participate in their child's learning journey. Notably, this caregiver letter is also made accessible in Spanish, ensuring inclusivity for diverse households.

Materials include information to guide teacher communications with caregivers.

- The instructional materials offer comprehensive guidance to facilitate effective teacher communication with caregivers. For instance, the Teacher's Guide contains a document titled “Parent/Guardian Letters,” designed to introduce caregivers to the program when sent home with students.
- The Teacher's Guide also features an Additional Resources section that provides a parent letter, further facilitating teacher-caregiver communications. In addition to this, the “Home to School Connection” document serves as a valuable tool for aiding communication between teachers and caregivers. It provides conversation starters that can be employed to foster productive discussions and engagement with students at home.
- The teacher guidance materials also emphasize the scaffolding and differentiation support for student learning. These materials include one-page handouts for reinforcing learning at home, comprehensively covering key points, activities, vocabulary, and picture talks, among other elements.
- Moreover, the instructional materials also encourage caregivers to actively participate in their child's learning journey. The “Parent/Caregiver Letter” invites caregivers to explore the Dynamic Science course with their child and assures them of the teacher's guidance regarding the areas students should focus on each week. Such features enable caregivers to engage in ongoing communication and partnership with teachers, thus fostering a collaborative approach to student learning.

Summit K12 Dynamic Physics

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 instructional materials accompanying the course consist of a comprehensive TEKS-aligned scope and sequence, which systematically outlines the order of teaching and the development of skills throughout the course.
- The scope and sequence can be found in the "Teacher Resources" section, under a tab titled "Teacher's Guide," which includes a "Scope and Sequence Pacing Guide" offering the recommended duration for each unit, thereby aiding educators in their planning.
- Additionally, the "TEKS CORRELATIONS" opens an Excel file that references TEKS correlations and contains links to areas in the curriculum which correspond to specific TEKS.

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

- Lesson guides in each unit provide detailed insights into key concepts, with explicit links to scientific practices and engineering. These are found by going through the "Planning with STEMscopes" tab and then the "Lesson Planning Guide." There is also support for teachers on implementing science and engineering practices in the "Instructional Supports" tab, which leads to the "Engaging Students in Scientific and Engineering Practice" tab.
- This facilitation is exemplified in Lesson Guide 3.2, which covers vertically launched projectiles and provides a cross-core for literacy. Such materials ensure science and engineering practices are embedded within all lessons, offering detailed guidance for each instructional session.

- These teacher resources further contain illustrative demonstrations and student activities that are not only aligned with Engineering Practices but also bolstered by practical, real-world applications. For instance, in Unit 5 on Circular Motion, students partake in activities promoting science modeling. Moreover, in Unit 7, an extension activity requires students to collaboratively design a structure analogous to a “Mars Lander,” utilizing the concept of momentum as their framework.

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

- Materials under “Teacher Resources” consistently provide clear guidance and resources to ensure mastery and retention of content through spiraled review and practice. For example, under “Content Mastery,” a document illustrates that students are unable to unlock later formative assessments until they score at least 80% on a vocabulary section. Students can retake the previous assessment until the students reach the score threshold.
- The provided lesson guides detail various student activities and learning opportunities in each unit. In the unit on Universal Gravitation, there is an Engage demonstration to remind and question students on how satellites orbit the Earth. This concept is introduced in Newton's Laws of Gravity and used again during Projectile Motion.
- Examples of this spiraling include Unit 8's lesson on Coulomb's Law, which introduces an activity allowing students to connect electric and gravitational force. In the activity, students discuss the differences between law, theory, and hypothesis and make arguments for whether Coulomb’s Law and the Law of Gravitation fit the correct definition. Similarly, continuity and concept integration are shown in Unit 9 (Circuits and Magnetism), where the instructional materials systematically build on previous concepts to foster a deeper understanding.

Summit K12 Dynamic 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.	M
3	Materials include a comprehensive list of all equipment and supplies needed to support instructional activities.	M
4	Materials include guidance for safety practices, including the course-appropriate use of safety equipment during investigations.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include 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 include standards correlations, including cross-content standards, that explain the standards within the context of the course. Materials include a comprehensive list of all equipment and supplies needed to support 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.

- The “Dynamics Physics Teacher’s Guide” offers detailed overviews and instructions on how to use resources and embedded assessment supports, with a section dedicated to “Accommodations, Accessibility, and Designated Supports” that uses screen capture for clearer comprehension.
- Most but not all links are functional within the Lesson Guides. Lesson guides within units, such as Unit 1 and Unit 5, offer structured lesson cycles, examples of demonstrations, discussion topics, and labs.
- Lesson Guides provide an overview of activities along with explanations and student expectations. For example, Lesson 7.2, “Momentum and Collisions,” presents an Engage activity in which the teacher shows examples of collisions, and students predict what will happen after the collision.

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

- The instructional materials offer a thorough alignment with standards, detailing correlations within the scope of individual lessons, broader units, and activities, all set within the context of the course. This alignment is particularly evident in the planning and pacing guide, where each unit has corresponding TEKS alignment, highlighting a significant component of the standard correlation. The lesson guides showcase ELPS and SEPs alignments and math and literacy alignment by using physics math skills to correlate with math standards. For example, in Lesson 2.3, Acceleration, the TEKS, ELPS, literary connections, and SEPs are all listed where they correlate in the lesson, and explanations are offered at the beginning of each lesson.
- In addition to these course-based standards, the materials actively involve literacy connections that align with TEKS. For instance, the "Lesson Guide" in Unit 5 outlines an activity asking students to distinguish between theories, hypotheses, and laws, with specific emphasis on understanding why Newton's Law of Gravity is considered a law. This incorporation of literacy offers a cross-disciplinary approach that strengthens the material's alignment with TEKS.
- Moreover, other units, such as Unit 8's lesson on the "Behavior of Charged Particles," include activities designed to bolster science literacy. Here, students read an article about the hydrogen bomb and subsequently write about it, reinforcing both their scientific understanding and literacy skills. Each individual lesson provides clear delineations of TEKS, SEPs, and ELPS. An illustrative example can be seen in Lesson 8.2, "Coulomb's Law," which includes an activity about electric forces that align with TEKS P.6(A) and SEP P.2(C).

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

- The instructional materials feature a "Dynamic Physics Teacher's Guide," which contains a master materials list for the course. This master list contains all materials needed to complete all activities and experiments for the entire course. This list is broken down by lessons for the teacher to know which materials are required for which units and lessons.
- For instance, the "Lesson Guide" for Unit 2, "Linear Motion," contains a materials list in its resources section, while the "Lesson Guide" for Unit 6, "Momentum," offers a live link to a materials list for all activities in that section. Another example is found in Unit 9, "Circuits and Magnetism," where all lessons are accompanied by a materials list detailing items such as hand generators, batteries, and magnets.

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

- The "Dynamics Physics Teacher's Guide" focuses on lab safety practices through a dedicated section under "Scientific and Engineering Practices." This resource is not only detailed but is also supplemented with visual aids, offering instructional slides that dictate lab safety procedures and protocols. Furthermore, a "Science Safety Contract" in the teacher resources offers a comprehensive list of "Safety Statements." The contract asks for information such as allergies, medical conditions, and emergency contacts.
- The materials provide explicit safety instructions tailored to lessons and activities. In Unit 2's "Speed vs. Velocity" lesson, an activity involving a mousetrap comes with explicit safety warnings. An investigation grounded in scientific and engineering practices includes a section on

the proper use, storage, and disposal of glassware, demonstrating how safety considerations are not limited to just the general rules but extend to the handling of specific materials.

Summit K12 Dynamic 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 guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression. 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.

- Found in the "Scope and Sequence Pacing Guide," Unit 1.1 offers a clear allotment of time for each lesson activity, assisting teachers in planning effectively. This guidance extends to other resources like the "Videos and Interactives" section, where the duration of each video is provided, such as the 12:02-minute video for Lesson 2.3, "Acceleration," facilitating time management for teachers.
- The "Teacher's Guide," within the "Scope and Sequence and Pacing Guide" section, includes a "Year at a Glance" document. It gives estimated time allotments for all units, accounting for 152 school days. This feature leaves room for flexibility, accommodating the beginning of the year activities, review time, district and state testing, and field trips, among other school events.
- The materials go further by providing time investment breakdowns for activities in each lesson, a useful tool for teachers navigating both block and traditional scheduling. An example of this is in Lesson 7.1, "Momentum and Impulse," which outlines activities for six days with correlated minutes of science instruction. Likewise, Lesson 8.1, "Behavior of Charged Particles," proposes extension activities such as field investigations and practice ranging from 30–90 minutes, offering guidance for comprehensive lesson planning.

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

- The instructional materials offer thorough guidance for strategic implementation, preserving the necessary sequence of content and facilitating developmental progression. Specifically, in Unit 4, "Forces," references and materials, such as the lesson "Mass, Weight, and Net Force," are provided to assist with scaffolding as needed, ensuring content sequencing. A pacing guide is present, offering flexibility for the school year's disruptions like state testing days or beginning-of-the-year activities. The Scope and Sequence Pacing Guide lists the number of days needed to complete each lesson, alongside suggestions for potential school year interruptions.

- These materials are flexible to the needs of the teachers or districts. For instance, under the "Scope and Sequence and Pacing Guide" in the "Teacher's Guide," the order of units can be rearranged as per the educator's preference, supporting strategic implementation.
- The materials show a clear delineation in the order of units and lessons. This order is visible in Unit 9, "Circuits and Magnetism," where Lesson 9.1, "Circuits and Magnetism," is followed by Lesson 9.2, "Ohm's Law and Power," ensuring students first understand the basic configuration of circuits before introducing the resistance variable. Similarly, materials group lessons within a unit displaying recurring themes and skills, as in Unit 7, which focuses on the concept of momentum and situations where momentum changes.

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

- The materials are inclusive of units, lessons, and activities intended for a full year of instruction. For instance, as illustrated in the Scope and Sequence Pacing Guide, the aggregate of days required to cover each unit aligns fittingly with the typical school year, despite numbering under 180 days. Additionally, within each lesson guide, such as under "Teacher Resources," Unit 2, "Linear Motion," lessons are marked as scaffolds, which can be optionally included or excluded depending on student needs, showcasing the material's adaptability.
- Each unit's materials come with suggested time allotments for completion, and multiple activities are available within each scope following the 5E + IA instructional plan. This feature enables teachers to select activities that best fit their scheduling preferences. For instance, in the "Scope and Sequence and Pacing Guide," the unit on "Vertically Launched Projectiles" provides estimated time allocations for each activity within the planner, allowing for modifications.
- "The Scope and Sequence Pacing Guide" recommends a total of 152 days of instructional time to cover all material, effectively fitting into a school year. Further demonstrating their flexibility, the materials offer guidance to adjust based on time constraints without hampering concept progression. An example is in Lesson 9.6, "Magnetic Fields and Electromagnetism," which displays an array of extension activities, such as discussions and concept maps that can be modified to accommodate pacing requirements.

Summit K12 Dynamic 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.

- The materials present an appropriate design that fosters learning and does not detract from it. Student handouts, for example, offer generous white space for student responses, contributing to a cleaner, more focused layout. Specific units, like Unit 8, Electrostatics, demonstrate this design principle by surrounding data tables and questions with adequate white space, preventing any possible distraction during student learning.
- Moreover, the design elements facilitate easy information retrieval for teachers. Section headers in lesson guides are boldly and prominently presented, allowing for simple referencing. The same accessibility extends to activities, which are presented in shaded boxes for easy scanning and locating within materials. Teacher's Guides exemplify this feature with clearly marked subtitles like ENGAGE, TEACH AND DISCUSS, APPLY AND EXTEND, and EVALUATE, assisting teachers in identifying activities aligned with the lesson's progression.
- In addition, the materials carry a consistent design scheme that does not distract from student learning. Lessons like “Wave Speed,” for instance, offer clearly titled investigation activities with straightforward purposes, maintaining a cohesive and nondistracting design.

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

- The materials incorporate age-appropriate pictures and graphics that foster student learning and engagement while avoiding unnecessary visual distractions. For instance, “Vocabulary Mastery” activities showcase pertinent images corresponding to the vocabulary words under assessments. Additionally, activities like the vocabulary assessment for the “Reflection and

Lenses" lesson employ diagrams or images to effectively illustrate vocabulary words that students need to learn.

- Examples of well-integrated graphics extend to Unit 8, Electrostatics, where the PowerPoint used with Behavior of Particles effectively employs graphics without causing distractions for students. Similarly, the "Atomic Spectra" lesson guide presents a discussion activity where students examine various pictures and diagrams, illuminating the concepts they'll learn throughout the lesson.
- The materials further assist students by providing suitably sized data tables for them to document data collected during investigations, and ensuring that symbols in the virtual investigation align with the simulation being used, promoting ease of use by students.

Materials include digital components that are free of technical errors.

- The materials are free of technical errors, extending to grammar and spelling, as well as correctness in answer keys and student response guidance. The digital components of the materials maintain a similar high standard of accuracy. This is demonstrated in Unit 7, Momentum and Collisions, specifically the Conservation of Momentum section, where all digital elements function correctly, and no grammatical or spelling mistakes are present.
- The same level of error-free precision applies to Unit 5, Gravitation and Circular Motion, where all digital components are devoid of technical inaccuracies, further reinforcing the consistent quality across the materials. Further examples of this include "Formative Assessment 2" for the "Quantum Properties" lesson and the "Doppler Effect Virtual Lab" activity guide, both of which are free of technical errors, thereby ensuring uninterrupted and effective student learning.

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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 materials effectively integrate digital technology and tools to bolster student learning and engagement. For instance, the Lesson Guide for Unit 4, Forces, Lesson 4.1, Newton's Laws, includes an activity where students use a PhET simulation to delve into Newton's First and Second Laws. The concept mastery sections further extend this integration, as each lesson is equipped with a TEKS Mastery video that delivers digital content to students.
- Moreover, these materials embrace student digital components with embedded tools. For instance, the "Wave Behaviors" lesson offers an online "Formative Assessment 1" with a text-to-speech function. The "Formative Assessment 2" for the "Reflection and Mirrors" lesson also showcases a suite of digital tools, such as note-taking capabilities, variable font size, text-to-speech, reference material, annotations, highlighting, bookmarking, and a strikethrough option.

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

- The materials deftly incorporate digital technology, bolstering student engagement with scientific and engineering practices as well as course-specific content. This structure is exemplified in the Linear Motion Unit Lesson Guide 2.3, where students use a simulation to produce and adjust position-time, velocity-time, and acceleration graphs, illustrating to students how identical motion can be depicted differently across various graphs. Additionally, the

"Physics Videos and Interactives" section offers students two illustrative videos on speed versus velocity, underlining the active engagement facilitated by digital tools.
- Further, the materials offer interactive simulations and models, affording students the opportunity to delve into scientific and engineering practices in a virtual environment. For instance, the "Reflection and Lenses" lesson employs an interactive simulation in which students can examine image formation utilizing various mirrors and lenses such as plane, convex, and concave. Similarly, the "Wave Behaviors" lesson features a virtual lab allowing students to investigate the characteristics and behaviors of energy transferred by waves encompassing reflection, diffraction, refraction, and absorption. The lesson even allows students to develop and employ models of interference using a double-slit diffraction option within the simulation.

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

- The materials skillfully incorporate digital technology that fosters opportunities for both teachers and students to collaborate. This collaboration is exemplified in Unit 2's Linear Motion, Lesson 2.2, Speed vs Velocity, where students work in small groups to gather data with motion detectors and create motion graphs. This theme of collaboration is reiterated in the Unit 1 Introduction Lesson Guide, where students are prompted to research online and collectively construct presentations on the dangers of texting and driving.
- Similarly, in Unit 6, Work, Energy, and Power, the Conservation of Energy section hosts a digital lab titled "Virtual Lab: Rollercoaster," offering a platform for students to jointly explore potential and kinetic energy changes within the simulation. Furthermore, Unit 7, Momentum and Collisions, also promotes student collaboration in its "Virtual Lab: Collisions," where students work collaboratively to decipher the law of conservation of momentum and reinforce the link between this law and Newton's Third Law.
- Lastly, the "Wave Speed" lesson further encourages collaborative learning by providing guidance for the "Transverse Wave Interactive" and "Longitudinal Wave Interactive" activities. In each of these activities, students are given specific group goals, such as creating a transverse wave with a specific amplitude and wavelength, thereby promoting teamwork and mutual learning.

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

- The instructional materials seamlessly integrate digital technology, ensuring accessibility across various devices and learning management systems. Specifically, these digital materials can be utilized on an array of devices, including PCs, Chromebooks, and tablets. Information regarding access to materials across different devices and management systems can be found in the "Getting Started" link in the Teacher's Guide.
- Moreover, the materials are also compatible with numerous learning management systems. As illustrated in the "Teacher Getting Started" section of the Additional Resources, the material can be accessed through all major district LMS and SIS platforms via one of the Single Sign-On (SSO) solutions, which enables students to immediately access the course by clicking on the program icon. This ease of access extends to parents as well, as they are given instructions on how to use portals like Classlink or Clever to access the application.

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

Digital technology and online components 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.

- The instructional materials thoughtfully integrate digital technology and online components that are developmentally appropriate for the course and closely align with the scope and sequence of science knowledge and skills progression. For instance, a comprehensive scope and sequence can be found in the Teacher's Guide that links each activity to the relevant standards, illustrating their alignment.
- Moreover, specific online components, such as the videos in the Concept Mastery sections, are carefully selected to align with the content standards. Similarly, in Unit 7, Momentum and Collisions, the online components, like the research activity and Egg Drop Video, are developmentally fitting for the course. Further, in Unit 6, Work, Energy, and Power, online activities like the Conservation of Energy Online Lab, Conservation of Energy Practice, and Roller Coaster Virtual Lab are designed to be developmentally suitable for the physics course.
- The materials also display a keen emphasis on alignment with the Science and Engineering Practices (SEPs), as seen in lessons like “Wave Speed” and “Reflection and Lenses.” These lessons contain interactive activities such as the “Transverse Wave Interactive” and “Virtual Lab,” respectively, that are mapped to specific SEP objectives, demonstrating the careful alignment of these online components to the course's scope and sequence.

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

- The materials consistently provide comprehensive teacher guidance for the effective use of embedded technology designed to support and enhance student learning. For example, in Unit 4, Forces, Newton's Laws 4.1 Lesson Guide, guidance is provided for teachers on the implementation of digital lab activities, specifically a virtual lab exploring Newton's First and Second Laws. Similarly, within Unit 5's Gravitation and Circular Motion section, the Teacher's Guide offers detailed instructions for using the associated videos, study guide, and vocabulary boosters.
- Additional resources in the Teacher's Guide also provide extensive support, offering guidance on the use of embedded videos and interactives. The “Videos and Interactives” link informs teachers of how to access and integrate these materials into their lessons, thus enabling an enriched learning experience for students.
- Moreover, the Teacher's Guide includes a Concept Mastery section that serves as a reference for teachers to familiarize themselves with digital materials such as e-posters, TEKS videos, and interactives. The platform includes clear instructions and tutorials on how to assign and use the “Physics Videos and Interactives,” further enhancing teachers' ability to utilize the embedded technology to support student learning.

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

- The instructional materials feature robust resources that are readily accessible to parents and caregivers, supporting student engagement with digital technology and online components. For instance, the Teacher's Guide provides a “Home to School Connections” document link, which serves as a helpful tool for parents to stay informed about the content being taught in the course. Furthermore, a link to “Parent/Guardian Letters” is provided in the Teacher's Guide, enabling parents and caregivers to gain insights into the structure of the course and the materials available digitally.
- Another noteworthy example is the parent letter found in the Additional Resources section, which delivers comprehensive guidance for parents on how to set up online access, thereby facilitating their involvement in their children's learning journey. The “Home to School Connection” offers parents a clear guide to the different resources available on the course online.
- Furthermore, the Teacher's Guide includes a “Parent/Caregiver Letter” that includes step-by-step instructions on how to access digital materials, ensuring parents and caregivers can readily assist in the student's engagement with these resources. The letter also contains essential information and practical tips for families to promote appropriate student engagement with digital and online components.