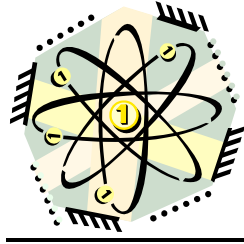


FRESNO UNIFIED SCHOOL DISTRICT PHYSICS COURSE OF STUDY



Introduction

The California Science Content Standards include Earth Science, Biology, Chemistry, and Physics. These standards are intended to prepare students for the more formal treatment of concepts, principles, and theories called for at the college level. In the middle school grades students should have developed and enhanced their formal reasoning abilities that reflect science as a way of knowing, and acquiring new science content knowledge. In grade 6-8 they connect concrete observations of a rich array of phenomena and unify models that help to simplify the ever-expanding body of science content knowledge. At the ninth grade level these skills will be revisited, reinforced and developed in depth. In the investigation and experimentation strand students are expected to: formulate hypotheses, to design experiments that will enable them to test predictions, and complete independent research projects utilizing the *World Wide Web*. They will also be expected to make oral reports and arguments based on evidence. In designing, carrying out, and reporting the results of experiments, they will be expected to make use of more complex mathematics.

Teaching and Learning

The National Research Council (1999) in How People Learn has recommended a framework to help guide the design and evaluation of environments that can optimize learning. (National Research Council, 1999, p.19). The framework identifies four interrelated attributes of learning environments that need cultivation:

1. Schools and classrooms must be learner centered. This incorporates prior knowledge, cultural differences, and students' own theories about intelligence and learning (p. 19-20).
2. Attention must be given to what is taught, why it is taught, and what mastery looks like. Many curricula fail to support learning with understanding that knowledge-centered environments emphasize (p. 21).
3. Formative assessments designed to provide evidence of learning are essential. Assessments must be learner friendly and provide the student with opportunities to revise and improve their thinking over a period of time (p. 22).
4. Learning is influenced in fundamental ways by the context in which it takes place. Teachers must design classroom activities and help students organize their work in ways that will build a community of learners. Teachers must also be able to create a community of learners among themselves (p. 22).

The Role of Technology

The use of technology in schools and classrooms will create new opportunities for curriculum and instruction by bringing real-world problems into the classroom. Peck and Dorricott (1994), listed ten reasons for using technology:

1. Students learn and develop at different rates.
2. Graduates must be proficient at accessing, evaluating, and communicating information.
3. Technology can foster an increase in the quantity and quality of students' thinking and writing.
4. Technology can nurture artistic expression.
5. Graduates must be globally aware and able to use resources that exist outside the school.
6. Technology creates opportunities for students to do meaningful work.
7. All students need access to high level and high-interest courses.
8. Graduates must solve complex problems.
9. Students must feel comfortable with the tools of the Information Age.
10. Schools must increase their productivity and efficiency (p. 53).

Science leaders must keep informed about changes in technology and its trends. Rapid changes in communications technology can redefine what the classroom looks like. Technology can also be a powerful pedagogical tool for human interaction that supports learning (National Research Council, 1999; Posner, 1995).

In an effort to establish a consistent content for technology education in schools, the International Technology Education Association (ITEA) has created the Standards for Technological Literacy: Content for the Study of Technology. The standards and associated benchmarks created present a vision of what students should know and be able to do in order to be technologically literate. The intent of the publication is to influence what happens in every K-12 classroom in America through the development of new curricula, textbooks, and student assessments (International Technology Education Association, 2000).

Reading and Language Arts Improvement Through Science Curriculum-The Research

The demand for literacy skills in the U.S. workplace is at an all time high and public schools are attempting to respond by increasing the basic literacy requirements for K-12 students. Despite these efforts, reading scores nationally have not improved over the last 30 years as measured by the National Assessment of Educational Progress (NAEP), and the U.S. continues to lag behind most other countries on international assessments in reading. In addition, the relative poor performance of U.S. students in mathematics and science assessments internationally is believed to also be rooted in their poor performance as readers. The weakness is that reading is seldom effectively integrated across the various content areas in schools. Reading comprehension, in particular, has been identified, as a critical skill children must possess to succeed in school beyond grade three. Even though texts remain the primary source of instruction for content, reading is seldom integrated into content area instruction. The development of reading skills is enhanced through the development of classification and oral communication skills and positive attitudes toward science (National Research Council, 2000; Lowery, 1995).

Teaching science in a way that is understandable and meaningful to students, as it promotes increased literacy, can be developed for students using existing science and language arts curricula and recognized best practice strategies (Crandall, 1995). Evidence has been reported that shows inquiry-related teaching effective in fostering ways of thinking, talking, and writing (Fradd & Lee, 1999; Met, 1994; Mohan, 1990; Rosebery et al., 1992).

English Learner Student Achievement Will Improve With Science Learning

Inquiry-oriented science teaching that is contextualized is especially valuable for culturally and linguistically diverse students. Science learning and language acquisition for English Learner students is mutually dependent. Through the contextualized use of language in science inquiry, students develop and practice complex language forms and functions. Through the use of language functions such as description, explanation and discussion in inquiry science, students enhance their conceptual understanding (Merino & Hammond, 1998).

Inquiry-related teaching is also effective in developing vocabulary and conceptual understanding of science. When English Learner students use English to solve real world science problems their acquisition of the language is more effective (Merino & Hammond, 1998). Learning vocabulary and academic language in context is most effective because only the vocabulary needed is used. English Language Learners, in particular, do not need to practice isolated vocabulary that will never be used (Lloyd & Contreras, 1987). Evidence collected in classrooms shows that students with large science vocabulary knowledge learned through memorization give the false impression they have scientific knowledge. The fact is that they do not understand the meaning of the words at all (Fradd & Lee, 1999; Met, 1994; Mohan, 1990; Rosebery et al., 1992).

Reading in the Content Area of Science

Many studies cite that learning science through the use of the English language develops fluency much more effectively. Language-minority students acquire scientific ways of thinking, talking, and writing through inquiry-oriented teaching (August & Hakuta, 1997; Rosebery et al., 1992; Ballenger, 1997). The research also implies that there is a need for explicit instruction in both academic language and reading to learn through text (Holliday, 1994; Kuehn, 1998; Pressley, et al, 1989; Santa & Alvermann, 1991). How students learn science and how they develop language skills and reading skills are interconnected. The contextualized use of language in science inquiry provides students practice with complex language forms and functions. Further, this type of explicit instruction must be embedded in the natural context of effective science instruction (Casteel & Isom, 1994; Lee, Fradd, & Sutman, (1995); Warren & Rosebery, 1993), and teacher professional development (Diaz, 1994). Parallels between this research and the research on reading comprehension are strong. It is all the more reason that a quality standards-based program is important to include in strategic plans to improve student achievement.

Critical thinking is developed through cognitively demanding context-embedded tasks in which children try to make sense out of the world. Their worldview, influenced by cultural perspective and understanding of words in cultural context, determines what is feasible in a scientific sense. English Learner students often understand science concepts in their primary language and may constitute prior knowledge that is never acknowledged (Met, 1994; Lowery, 1995).

Fresno Unified Secondary School Science Program Natural Sciences Sequence

Science Education Center
Jerry D. Valadez, Ed. D., K-12 Science Coordinator
559-248-7181
jvalad@fresno.k12.ca.us

<i>Middle School Grades 6-8</i>			<i>High School Grades 9-12</i>			
Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
Earth Science emphasis integrated with Life and Physical Sciences	Life Science emphasis integrated with Earth and Physical Sciences	Physical Science emphasis integrated with Earth and Life Sciences	Introductory Earth Science, or Biology Course of Study	Biology, Chemistry, or Physics Course of Study	Chemistry, Physics, or other standards-based advanced science course	Options include *science electives, honors level, or advanced level course

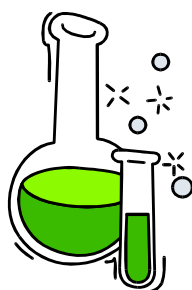
**Science Electives: The fourth year of laboratory science may include optional courses such as Physiology, Environmental Science, Ecology, Zoology, or Advanced Topics. Some sites may not offer all elective courses.*

Advanced Placement coursework that is identified as one of the standards-based course titles qualifies as a “second year” course. For example: Biology and AP Biology, Chemistry and AP Chemistry, Physics, and AP Physics.

State augmented assessments as part of the STAR package are available only for Earth, Biology, Chemistry, Physics, and Integrated Science. Only students enrolled in those courses are eligible to take the exams.

Algebra is a recommended prerequisite for Grade 9 Earth Science and all other science courses.

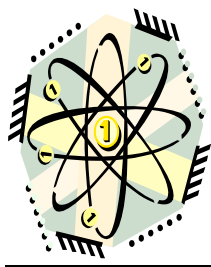
Some aspects of all four California Content Standards – Biology, Physics, Chemistry, and Earth/Space Science – must be covered in depth. The main goal of the Natural Sciences Sequence is to revisit concepts, principles and theories at successively higher levels of abstraction over six years of schooling.



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PHYSICS



There is a single light of science, and to brighten it anywhere is to brighten it everywhere.
--Isaac Asimov

Course of Study

Due to the nature of Physics topics the opportunity for students to develop abstract thinking and higher order problem solving skills abound with every content standard. Academic growth with this course includes analytical and complex reasoning skills, advanced data collection and analysis, complex calculations and report writing. As they progress through this course, self-confidence at having completed these challenging topics and concepts allows all students to increase their knowledge of scientific inquiry, and become better equipped to be scientifically literate adults. Coupled with traditional topics of classic physics this course includes current issues such as the challenge of transporting goods in our society, and recycling of the Earth's resources.

The high school science standards require more than two years of science courses for students to achieve the breadth and depth described. Schools and districts will be challenged to develop a science curriculum that meets the needs of their students and provides them the maximum opportunity to learn the standards while encouraging students to study further in science. In grades nine through twelve, standards that all students are *expected to achieve* in their science courses are unmarked; standards that all students should have *the opportunity to learn* in those courses are marked with an asterisk.

1. Investigation & Experimentation

Standards and Assessments "Students know..."	Task Analysis "Students are able to..."	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>1f Hypothesis, Theory, Tools and Technology</p> <p align="center">0</p> <div data-bbox="154 1083 393 1131" style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>		<p>Prentice Hall: Chapter 1.3 - 1.5</p> <div data-bbox="737 732 1000 852" style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Either Lab 64 Tick Tock</p> <p>Mass of Paper Circles</p> <p>Inquiry Lab, Density Lab</p> <p>CDP 1-1</p> <p>NTQ 1-1</p>	<div data-bbox="1057 474 1365 527" style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Hypothesis Theory Dependent Variable Independent Variable Fact Law Principle Scientific Methos</p> <div data-bbox="1057 999 1294 1052" style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Using Technology</p> <div data-bbox="1057 1209 1365 1308" style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Interactive Text Graphic Organizer Definitions Lab Reports</p> <div data-bbox="1057 1524 1370 1593" style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div> <p>GRSW ELL Handbook</p>	

1. Motion & Forces - Newton's laws predict the motion of most objects. As a basis for understanding this concept:

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1a Students know how to solve problems that involve constant speed and average speed.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define speed and distinguish between instantaneous speed and average speed.</p> <p>Distinguish between speed and velocity and describe how to tell whether a velocity is changing.</p> <p>Explain the idea that motion is relative.</p>	<p>Prentice Hall: Ch. 2.1, 2.2, 2.3</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Lab 2 Physics 500</p> <p>Lab 5 Conceptual Graphing Steps 1-9</p> <p>NTQ 2-1, 2-2</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Rate Relative Speed Instantaneous Speed Average Speed Velocity</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Define Compare and Contrast Explain Compute</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Interactive Text Graphic Organizer Definitions Lab reports</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div> <p>KWL Cooperative Groups Realia</p>	

Standards and Assessments "Students know..."	Task Analysis "Students are able to..."	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>If Students know applying a force to an object perpendicular to the direction of its motion causes the object to change direction but not speed (e.g., Earth's gravitational force causes a satellite in a circular orbit to change direction but not speed).</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe satellites as fast-moving projectiles.</p> <p>Distinguish between rotate and revolve.</p> <p>Describe rotational speed.</p> <p>Give examples of centripetal force.</p> <p>Describe the motion of an object if the centripetal force acting on it ceases.</p> <p>Explain why centrifugal force is "fictitious."</p> <p>Describe how a simulated gravitational acceleration can be produced.</p>	<p>Prentice Hall: Ch. 9 All Ch. 3.6</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p> <p>CDP 9-1, 9-2, 9-3</p> <p>NTQ 9-1</p> <p>PSE 6-1 PSE 2-2</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Axis Rotation Revolution Linear Speed Tangential Speed Rotational Speed Centripetal Force Centrifugal Force Satellite</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">SKILLS FOCUS:</div> <p>Describe Distinguish Explain Compute Calculate</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">EL STRATEGIES</div> <p>KWL Cooperative Groups Realia</p>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>1i* Students know how to solve two-dimensional trajectory problems.</p> <p>0</p> <p>ASSESSMENT</p> <p>[CST]</p>	<p>For a projectile, describe the changes in the horizontal and vertical components of it's velocity, when air resistance is negligible.</p> <p>Explain why a projectile moves equal distances horizontally in equal time intervals, when air resistance is negligible.</p>	<p>Prentice Hall: Ch. 3.4, 3.5</p> <p>LABS/DEMOS/ ACTIVITIES & RESOURCES:</p> <p>7 Bulls Eye</p> <p>CDP 3-1, 3-2</p> <p>NTQ 3-1, 3-3</p>	<p>KEY VOCABULARY:</p> <p>Projectiles</p> <p>SKILLS FOCUS:</p> <p>Describe Define Explain Compute</p> <p>LITERACY CONNECTIONS</p> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <p>EL STRATEGIES</p>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1j* Students know how to resolve two-dimensional vectors into their components and calculate the magnitude and direction of a vector from its components.</p> <p>0</p> <div data-bbox="154 961 393 1010" style="border: 1px solid black; padding: 2px; width: fit-content;">ASSESSMENT</div> <p>[CST]</p>	<p>Distinguish between a vector quantity and a scalar quantity, and give examples of each.</p> <p>Draw vector diagrams for velocities and use the parallelogram method to find the resultant of two vectors that have different directions.</p> <p>Given a vector, resolve it into horizontal and vertical components.</p>	<p>Prentice Hall: Ch. 3.1, 3.2, 3.3</p> <div data-bbox="737 674 1000 793" style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Lab Orienteering</p> <p>Lab 7 Bulls Eye</p> <p>CDP 3-1, 3-2</p> <p>NTQ 3-1, 3-2, 3-3</p> <p>PSE 2-1</p>	<div data-bbox="1052 422 1365 470" style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Vector Quantity Scalar Quantity Vector Resultant Components Resolution</p> <div data-bbox="1052 848 1294 896" style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">SKILLS FOCUS:</div> <p>Compare and Contrast Model Draw Visualize Resolve Compute Graph</p> <div data-bbox="1052 1203 1365 1297" style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div data-bbox="1052 1577 1370 1650" style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">EL STRATEGIES</div> <p>Guided reading Cooperative Groups Realia</p>	

Physics – Page 6

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1b Students know that when forces are balanced, no acceleration occurs; thus an object continues to move at a constant speed or stays at rest (Newton's first law).</p> <div data-bbox="154 1056 393 1102" style="border: 1px solid black; padding: 2px; width: fit-content;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe Galileo's contribution to the science of motion.</p> <p>State Newton's first law of motion</p> <p>Explain how something that is not connected to the ground is able to keep up with the moving Earth</p> <p>Explain why a clothesline or wire that can easily support an object when strung vertically may break when strung horizontally and supporting the same object.</p> <p>Describe how the angle between vectors affects their resultant vector.</p>	<p>Prentice Hall: Ch. 4.3, 4.4, 4.6, 4.7, 4.8</p> <div data-bbox="738 642 1000 762" style="border: 1px solid black; padding: 5px; text-align: center;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Lab 8 Going Nuts</p> <p>Lab 9 Buckle Up</p> <p>NTQ 4-1, 4-2</p>	<div data-bbox="1057 422 1365 468" style="border: 1px solid black; padding: 2px; text-align: center;">KEY VOCABULARY:</div> <p>Force Friction Law of Inertia Newton's First Law Net Force Support Force Normal Force Equilibrium</p> <div data-bbox="1057 940 1294 987" style="border: 1px solid black; padding: 2px; text-align: center;">SKILLS FOCUS:</div> <p>Describe Explain Compute Graph Calculate</p> <div data-bbox="1057 1203 1365 1297" style="border: 1px solid black; padding: 2px; text-align: center;">LITERACY CONNECTIONS</div> <p>Word Wall Graphic Organizer</p> <div data-bbox="1057 1501 1372 1575" style="border: 1px solid black; padding: 2px; text-align: center;">EL STRATEGIES</div> <p>Concept map</p>	

Physics – Page 7

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1k*</p> <p>Students know how to solve two-dimensional problems involving balanced forces (statics).</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain how something that is not connected to the ground is able to keep up with the moving Earth.</p> <p>Explain why a clothesline or wire that can easily support an object when strung vertically may break when strung horizontally and supporting the same object.</p> <p>Describe how the angle between vectors affects their resultant vector.</p>	<p>Prentice Hall: Ch. 4.6, 4.7, 4.8</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Lab Force Table CDP 4-2, 4-3</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Net Force Support Force Normal Force</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Explain Infer Describe Compute Calculate</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Questioning strategies</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div> <p>Realia</p>	

Physics – Page 8

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1c Students know how to apply the law $F=ma$ to solve one-dimensional motion problems that involve constant forces (Newton's second law).</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>State the relationship between acceleration and net force.</p> <p>State the relationship between acceleration and mass.</p> <p>State and explain Newton's second law of motion.</p>	<p>Prentice Hall: Ch. 5.1, 5.2, 5.3</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Lab 4 Merrily We Roll Along</p> <p>Lab 6 Race Track</p> <p>Lab 11 Getting Pushy</p> <p>Lab 12 Constant Force</p> <p>Lab 13 Constant Acceleration</p> <p>CDP 5-1 Back Page</p> <p>NTQ 5-1, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7</p> <p>PSE 3-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Acceleration Inversely Newton's Second Law</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Identify Explain</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1d Students know that when one object exerts a force on a second object, the second object always exerts a force of equal magnitude and in the opposite direction (Newton's third law).</p> <p style="text-align: center;">()</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define force as part of an interaction.</p> <p>State Newton's third law of motion.</p> <p>Given an action force, identify the reaction force.</p> <p>Explain why the accelerations caused by an action force and by a reaction force do not have to be equal.</p> <p>Explain why an action force is not cancelled by the reaction force.</p> <p>Describe the horse-cart problem.</p> <p>Explain why you cannot touch without being touched.</p>	<p>Prentice Hall: Ch. 6 All</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>Demo Lab 16 Balloon Rocket</p> <p>Other demos illustrating Newton's Third Law</p> <p>CDP 6-1</p> <p>NTQ 6-1, 6-2, 6-3, 6-4, 6-5, 6-6</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Interaction Action Force Reaction Force Newton's Third Law</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Define Identify Explain Describe</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div> <p>Realia Questioning strategies Guided reading</p>	

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]Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>2d Students know how to calculate momentum as the product mv.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define momentum.</p>	<p>Prentice Hall: Ch. 7.1</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>19 Go Cart NTQ 7-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Momentum</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>2e Students know momentum is a separately conserved quantity different from energy.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>State the law of conservation of momentum.</p>	<p>Prentice Hall: Ch. 7.4</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>20 Tailgated by a Dart (Demo)</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Conserved Conservation of Momentum</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto; margin-top: 20px;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto; margin-top: 20px;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>2f Students know an unbalanced force on an object produces a change in its momentum.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define impulse and describe how it affects changes in momentum.</p>	<p>Prentice Hall: Ch. 7.2</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>19 Go Cart PSE 4-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Impulse</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>2g Students know how to solve problems involving elastic and inelastic collisions in one dimension by using the principles of conservation of momentum and energy.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Distinguish between an elastic collision and an inelastic collision.</p>	<p>Prentice Hall: Ch. 7.5 Ch. 8.6</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>19 Go Cart</p> <p>CDP 7-1</p> <p>PSE 4-2 PSE 5-2</p>	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Collision Elastic Collision Inelastic Collision Conservation of Energy</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">EL STRATEGIES</div>	

2. Conservation of Energy and Momentum - The laws of conservation of energy and momentum provide a way to predict and describe the movement of objects. As a basis for understanding this concept:

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>2a Students know how to calculate kinetic energy by using the formula $E=(1/2)mv^2$.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define kinetic energy and describe the work-energy theorem.</p>	<p>Prentice Hall: Ch. 8.5</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>21 Making the Grade 23 Cut Short 24 Conserving Your Energy 28 Releasing Your Potential</p>	<div style="border: 1px solid black; padding: 2px; text-align: center; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Kinetic Energy Work-energy Theorem</p> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">SKILLS FOCUS:</div> <p>Define Describe Calculate Compute Graph</p> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>2b Students know how to calculate changes in gravitational potential energy near Earth by using the formula (change in potential energy) =mgh (h is the change in the elevation).</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define potential energy</p>	<p>Prentice Hall: Ch. 8.4</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>23 Cut Short 24 Conserving Your Energy 28 Releasing Your Potential</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <p>Potential Energy Gravitational Potential Energy</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Define Calculate Compute Graph</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>2c Students know how to solve problems involving conservation of energy in simple systems, such as falling objects.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>State the law of conservation of energy.</p>	<p>Prentice Hall: Ch. 8.6</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>23 Cut Short Conserving Your Energy</p> <p>CDP 8-1</p> <p>PSE 5-2</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Conservation of Energy</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>2h*</p> <p>Students know how to solve problems involving conservation of energy in simple systems with various sources of potential energy, such as capacitors and springs.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define potential energy.</p> <p>Explain why a charged object in an electric field is considered to have electrical potential energy.</p> <p>Describe how electrical energy can be stored.</p>	<p>Prentice Hall: Ch. 8.4 Ch. 33.4, 33.6</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>23 Cut Short 24 Coserving Your Energy 88 Brown Out</p> <p>NTQ 33-1</p> <p>PSE 16-1</p>	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Potential Energy Electical Potential Energy Capacitor</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1g Students know circular motion requires the application of a constant force directed toward the center of the circle.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Give examples of centripetal force.</p> <p>Describe the motion of an object if the centripetal force acting on it ceases.</p>	<p>Prentice Hall: Ch. 9.3, 9.4</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>30 Going in Circles</p> <p>CDP 9-1</p> <p>NTQ 9-1</p> <p>PSE 6-1</p>	<div style="border: 1px solid black; padding: 2px; text-align: center; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Centripetal Force Centrifugal Force</p> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">SKILLS FOCUS:</div> <p>Describe</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments "Students know..."	Task Analysis "Students are able to..."	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>11* Students know how to solve problems in circular motion by using the formula for centripetal acceleration in the following form: $a=v^2/r$.</p> <p style="text-align: right;">()</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Distinguish between rotate and revolve.</p> <p>Describe rotational speed.</p> <p>Give examples of centripetal force.</p> <p>Describe the motion of an object if the centripetal force acting on it ceases.</p> <p>Explain why centrifugal force is "fictitious."</p> <p>Describe how a simulated gravitational acceleration can be produced.</p>	<p>Prentice Hall: Ch. 9 All</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>30 Going in Circles</p> <p>CDP 9-1, 9-2. 9-3</p> <p>NTQ 9-1</p> <p>PSE 6-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <p>Axis Rotation Revolution Linear Speed Tangential Speed Rotational Speed Centripetal Force Centrifugal Force</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <p>Compare and Contrast Describe Explain Compute Calculate</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1m*</p> <p>Students know how to solve problems involving the forces between two electric charges at a distance (Coulomb's law) or the forces between two masses at a distance (universal gravitation).</p> <p>0</p> <div data-bbox="154 1056 393 1102" style="border: 1px solid black; padding: 2px; width: fit-content;">ASSESSMENT</div> <p>[CST]</p>	<p>State Newton's law of universal gravitation.</p> <p>Explain the significance of an inverse-square law.</p> <p>Explain the connection between gravitation and the idea that the universe may stop expanding and begin to contract.</p> <p>Describe Coulomb's law.</p>	<p>Prentice Hall: Ch. 12.4, 12.5, 12.6 Ch. 32.3</p> <div data-bbox="738 703 1000 823" style="border: 1px solid black; padding: 5px; text-align: center;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p> <p>CDP 12-1 CDP 32-1</p> <p>NTQ 12-1, 12-2 NTQ 32-1</p> <p>PSE 7-1, 7-2</p>	<div data-bbox="1057 420 1365 466" style="border: 1px solid black; padding: 2px; text-align: center;">KEY VOCABULARY:</div> <p>Law of Universal Gravitation</p> <p>Universal Gravitational Constant, G</p> <p>Inverse-square Law</p> <p>Perturbation</p> <div data-bbox="1057 1001 1294 1047" style="border: 1px solid black; padding: 2px; text-align: center;">SKILLS FOCUS:</div> <p>Describe Explain Calculate Compute Graph</p> <div data-bbox="1057 1264 1365 1356" style="border: 1px solid black; padding: 2px; text-align: center;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div data-bbox="1057 1621 1370 1694" style="border: 1px solid black; padding: 2px; text-align: center;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>1e Students know the relationship between the universal law of gravitation and the effect of gravity on an object at the surface of Earth.</p> <p>0</p> <div data-bbox="154 1115 394 1163" style="border: 1px solid black; padding: 2px; width: fit-content;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain Newton's idea of why the apple falls to Earth.</p> <p>Explain why the moon does not fall to Earth.</p> <p>Explain how Earth is falling.</p> <p>State Newton's law of universal gravitation.</p> <p>Explain the significance of an inverse-square law.</p> <p>Explain the connection between gravitation and the idea that the universe may stop expanding and begin to contract.</p>	<p>Prentice Hall: Ch. 12 All</p> <div data-bbox="737 674 1000 793" style="border: 1px solid black; padding: 5px; text-align: center;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>4 Merrily We Roll Along</p> <p>36 Acceleration of Free Fall</p> <p>38 Aparent Weightlessness</p> <p>CDP 12-1</p> <p>NTQ 12-1, 12-2</p> <p>PSE 7-1, 7-2</p>	<div data-bbox="1057 422 1365 470" style="border: 1px solid black; padding: 2px; text-align: center;">KEY VOCABULARY:</div> <p>Law of Universal Gravitation Universal Gravitational Constant, G Inverse-square Law Perturbation</p> <div data-bbox="1057 848 1294 896" style="border: 1px solid black; padding: 2px; text-align: center;">SKILLS FOCUS:</div> <p>Explain Identify Graph Compute</p> <div data-bbox="1057 1079 1365 1173" style="border: 1px solid black; padding: 2px; text-align: center;">LITERACY CONNECTIONS</div> <div data-bbox="1057 1499 1370 1572" style="border: 1px solid black; padding: 2px; text-align: center;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>5i Students know plasmas; the fourth state of matter, contain ions or free electrons or both and conduct electricity.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe the solid, liquid, gaseous, and plasma states of matter.</p>	<p>Prentice Hall: Ch. 17.9</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Plasma</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

3. Heat and Thermodynamics - Energy cannot be created or destroyed, although in many processes energy is transferred to the environment as heat. As a basis for understanding this concept:

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>3a Students know heat flow and work are two forms of energy transfer between systems.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain conduction and its effects.</p> <p>Distinguish between conduction and convection.</p> <p>Explain how heat can be transmitted through empty space.</p> <p>Relate the temperature difference between an object and its surroundings to the rate at which it cools.</p>	<p>Prentice Hall:</p> <p>Ch. 21.1, 21.2, 21.3, 21.4, 21.5, 21.6</p> <p>Ch. 22.1, 22.2, 22.3</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>61 Work for Your Ice Cream 26 Wrap Your Energy in a Bow</p> <p>CDP 21-1</p> <p>NTQ 21-1, 21-2 NTQ 22-1, 22-2</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Temperature Celsius Scale Fahrenheit Scale Kelvin Scale Absolute Zero Heat Thermal Contact Thermal Equilibrium Internal Energy Calorie Kilocalorie Specific Heat Capacity Conduction Conductors Insulators Convection Radiation Radiant Energy</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>3c Students know the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. The greater the temperature of the object, the greater the energy of motion of the atoms and molecules that make up the object.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define temperature in terms of kinetic energy of the objects atoms and molecules.</p> <p>Define heat.</p>	<p>Prentice Hall: 21.4</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>49 Heat Mixes It Part 1 50 Heat Mixes It Part 2 52 Gulf Stream in a Flask 53 The Bridge Connection</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Internal Energy</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <p>Questioning strategies Graphic organizers Scientific discourse Reading comprehension</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>3b Students know that the work done by a heat engine that is working in a cycle is the difference between the heat flow into the engine at high temperature and the heat flow out at a lower temperature (first law of thermodynamics) and that this is an example of the law of conservation of energy.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>State the first law of thermodynamics and relate it to energy conservation.</p> <p>Define the ideal efficiency of a heat engine in terms of input and output temperatures.</p>	<p>Prentice Hall: Ch. 24.2, 24.3</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>62 Drinking Bird CDP 24-1 NTQ 24-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>First Law of Thermodynamics Adiabatic</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>3d Students know that most processes tend to decrease the order of a system over time and that energy levels are eventually distributed uniformly.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain how order tends to disorder.</p> <p>Define entropy and give examples.</p>	<p>Prentice Hall: Ch. 24.4, 24.5, 24.6, 24.7</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Second Law of Thermodynamics Heat Engine Carnit Efficiency Entropy</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>3e Students know that entropy is a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system.</p> <p>()</p> <p>ASSESSMENT</p> <p>[CST]</p>	<p>Explain how order tends to disorder.</p> <p>Define entropy and give examples.</p>	<p>Prentice Hall: Ch. 24.4, 24.5, 24.6, 24.7</p> <p>LABS/DEMOS/ ACTIVITIES & RESOURCES:</p> <p>No Labs</p>	<p>KEY VOCABULARY:</p> <p>Second Law of Thermodynamics Heat Engine Carnit Efficiency Entropy</p> <p>SKILLS FOCUS:</p> <p>LITERACY CONNECTIONS</p> <p>EL STRATEGIES</p>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>3f* Students know the statement "Entropy tends to increase" is a law of statistical probability that governs all closed systems (second law of thermodynamics).</p> <p style="text-align: center;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain how order tends to disorder.</p> <p>Define entropy and give examples.</p>	<p>Prentice Hall: Ch. 24.4, 24.5, 24.6, 24.7</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Second Law of Thermodynamics Heat Engine Carnit Efficiency Entropy</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>3g* Students know how to solve problems involving heat flow, work, and efficiency in a heat engine and know that all real engines lose some heat to their surroundings.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define the ideal efficiency of a heat engine in terms of input and output temperatures.</p>	<p>Prentice Hall: Ch. 24.5</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>62 Drinking Bird</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Heat Engine Carnot Efficiency</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

4. Waves - Waves have characteristic properties that do not depend on the type of wave. As a basis for understanding this concept:

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>4a Students know waves carry energy from one place to another.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe wave motion.</p>	<p>Prentice Hall: Ch. 25.3</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>64 Tick Tock 65 Grandfather's Clock</p> <p>PSE 12-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>(None)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>4b Students know how to identify transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves).</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Distinguish between transverse waves and longitudinal waves.</p>	<p>Prentice Hall: Ch. 25.5, 25.6</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>66 Catch A Wave 67 Ripple While You Work</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Transverse Waves Longitudinal Waves</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto; margin-top: 20px;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto; margin-top: 20px;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>4c Students know how to solve problems involving wavelength, frequency, and wave speed.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe the period of a pendulum.</p> <p>Describe the characteristics and properties of waves.</p>	<p>Prentice Hall: Ch. 25.2, 25.4</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Simple Harmonic Motion Sine Curve Crests Troughs Amplitude Wavelength Frequency Hertz</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto; margin-top: 20px;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto; margin-top: 20px;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>4f Students know how to identify the characteristic properties of waves: interference (beats), diffraction, refraction, Doppler effect, and polarization.</p> <p style="text-align: center;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Distinguish between constructive and destructive interference.</p> <p>Describe the Doppler effect for sound and relate it to the blue and red shifts for light.</p> <p>Describe beats.</p> <p>Describe the evidence that suggests that light waves are transverse.</p> <p>Describe the change of direction of a wave when it crosses a boundary between media.</p> <p>Describe the effects of refraction of light.</p> <p>Explain how mirages are formed.</p>	<p>Prentice Hall: Ch. 25.7, 25.9 Ch. 27.7 Ch. 26.10 Ch. 31.1, 31.2, 31.3 Ch. 29.6, 29.7, 29.8, 29.9</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>66 Catch A Wave 67 Ripple While You Work 72 Shades 76 Pepper's Ghost 77 The Kaleidoscope</p> <p>CDP 25-1 CDP 29-3, 29-4 CDP 27-2</p> <p>NTQ 29-5, 29-6, 29.7, 29.8</p>	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Interference Pattern Constructive Interference Destructive Interference Out of Phase In Phase Doppler Effect Polarization Beats Huygen's Principle Diffraction Refraction Wave Fronts Mirage</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>4d Students know sound is a longitudinal wave whose speed depends on the properties of the medium in which it propagates.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe the movement of sound through air.</p> <p>Compare the transmission of sound through air with that through solids, liquids, and a vacuum.</p> <p>Describe factors that affect the speed of sound.</p>	<p>Prentice Hall: Ch. 26.2, 26.3, 26.4</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>68 Chalk Talk 69 Mach One</p> <p>CDP 26-1 NTQ 26-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Compression Rarefaction</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>4e Students know radio waves, light, and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in a vacuum is approximately 3×10^8 m/s (186,000 miles/second).</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain why it is difficult to measure the speed of light.</p> <p>Describe the relationship among light, radio waves, microwaves, and X-rays.</p>	<p>Prentice Hall: Ch. 27.2, 27.3</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p> <p>NTQ 27-1, 27-2</p> <p>PSE 13-1</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <p>Light-year Electromagnetic Wave Electromagnetic Spectrum Infrared Ultraviolet</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

5. *Electric and Magnetic Phenomena - Electric and magnetic phenomena are related and have many practical applications. As a basis for understanding this concept:*

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Aprox. Time (per 180 days)
<p>5a Students know how to predict the voltage or current in simple direct current (DC) electric circuits constructed from batteries, wires, resistors, and capacitors.</p> <p>ASSESSMENT</p> <p>[CST]</p>	<p>Describe the flow of electric charge.</p> <p>Describe what is happening inside a current-carrying wire.</p> <p>Give examples of voltage sources that can maintain a potential difference in a circuit.</p> <p>Describe the factors that affect the resistance of a wire.</p> <p>Describe Ohm's law.</p> <p>0 Explain the causes of electric shock.</p> <p>Describe how electrical potential energy can be stored.</p>	<p>Prentice Hall: Ch. 34.1, 34.2, 34.3, 34.4, 34.5, 34.6 Ch. 33.6</p> <p>LABS/DEMOS/ ACTIVITIES & RESOURCES:</p> <p>87 Sparky the Electrician 90 Getting Wired</p> <p>CDP 34-1</p> <p>NTQ 34-1 NTQ 33-1</p> <p>PSE 16-1</p>	<p>KEY VOCABULARY:</p> <p>Potential Difference Electric Current Amperes Voltage Source Electric Resistance Ohm's Law Capacitor</p> <p>SKILLS FOCUS:</p> <p>LITERACY CONNECTIONS</p> <p>EL STRATEGIES</p>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5e Students know charged particles are sources of electric fields and are subject to the forces of the electric fields from other charges.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe how to measure the strength of an electric field at different points.</p> <p>Describe how electric fields are represented by vectors and by electric field lines.</p>	<p>Prentice Hall: Ch. 33.1, 33.2</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>94 You're Repulsive CDP 33-1 PSE 15-2</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Electric Field</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5j* Students know electric and magnetic fields contain energy and act as vector force fields.</p> <p>ASSESSMENT</p> <p>[CST]</p>	<p>Describe how electrical fields are represented by vectors and by electric field lines.</p> <p>Use iron filings to interpret the strength of a magnetic field at different points near a magnet.</p> <p>Relate the motion of electrons within a material to the ability of the material to become a magnet.</p> <p>Describe what happens to the magnetic domains of iron in the presence of a strong magnet.</p>	<p>Prentice Hall: Ch. 33.2 Ch. 36.2, 36.3, 36.4</p> <p>LABS/DEMOS/ ACTIVITIES & RESOURCES:</p> <p>93 3D Magnetic Fields 94 You're Repulsive</p> <p>CDP 33-1 NTQ 36-1</p> <p>PSE 15-2 PSE 17-1</p>	<p>KEY VOCABULARY:</p> <p>Magnetic Field Magnetic Domain</p> <p>SKILLS FOCUS:</p> <p>LITERACY CONNECTIONS</p> <p>EL STRATEGIES</p>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5k*</p> <p>Students know the force on a charged particle in an electric field is qE, where E is the electric field at the position of the particle and q is the charge of the particle.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe how to measure the strength of an electric field at different points.</p>	<p>Prentice Hall: Ch. 33.1</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>94 You're Repulsive</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Electric Field</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5]*</p> <p>Students know how to calculate the electric field resulting from a point charge.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe how to measure the strength of an electric field at different points.</p>	<p>Prentice Hall: Ch. 33.1</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Electric Field</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5m*</p> <p>Students know static electric fields have as their source some arrangement of electric charges.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe how to measure the strength of an electric field at different points.</p> <p>Describe how electric fields are represented by vectors and by electric field lines.</p>	<p>Prentice Hall: Ch. 33.1, 33.2</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>86 Static Cling</p> <p>CDP 33-1</p> <p>PSE 15-2</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Electric Field</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5o* Students know how to apply the concepts of electrical and gravitational potential energy to solve problems involving conservation of energy.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Explain why a charged object in a electric field is considered to have electrical potential energy.</p>	<p>Prentice Hall: Ch. 33.4</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>88 Brown Out 28 Raising Your Potential</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5b Students know how to solve problems involving Ohm's law.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe Ohm's law.</p> <p>Describe the configuration of a working circuit.</p> <p>Distinguish between series and parallel circuits.</p> <p>Describe the characteristics of series connections and of parallel connections.</p> <p>Interpret circuit diagrams.</p> <p>Determine the equivalent resistance of circuits having two or more resistors.</p> <p>Explain the cause and prevention of overloading household circuits.</p>	<p>Prentice Hall: Ch. 34.5 Ch. 35 All</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 150px; text-align: center;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>89 Ohm Sweet Ohm</p> <p>CDP 34-1 CDP 35-1, 35-2</p> <p>NTQ 35-1, 35-2, 35-3</p> <p>PSE 16-4</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">KEY VOCABULARY:</div> <p>Ohm's Law Series Parallel Series Circuit Parallel Circuit Shcematic Diagrams Compound Circuit</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 150px; text-align: center;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 180px; text-align: center;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 180px; text-align: center;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5c Students know any resistive element in a DC circuit dissipates energy, which heats the resistor. Students can calculate the power (rate of energy dissipation) in any resistive circuit element by using the formula $P = IR$ (potential difference) – I (current) = I^2R.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Relate the electric power used by a device to current and voltage.</p>	<p>Prentice Hall: Ch. 34.11</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>89 Ohm Sweet Ohm CDP 34-2 PSE 16-2, 16-3</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Electric Power</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5f Students know magnetic materials and electric currents (moving electric charges) are sources of magnetic fields and are subject to forces arising from the magnetic fields of other sources.</p> <p style="text-align: center;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Compare and contrast magnetic poles and electric charges.</p> <p>Use iron filings to interpret the strength of a magnetic field at different points near a magnet.</p> <p>Relate the motion of electrons within a material to the ability of the material to become a magnet.</p> <p>Describe what happens to the magnetic domains of iron in the presence of a strong magnet.</p> <p>Describe the magnetic field produced by a current-carrying wire.</p> <p>Describe how a magnetic field exerts a force on a charged particle in the field.</p>	<p>Prentice Hall: Ch. 36.1, 36.2, 36.3, 36.4, 36.5, 36.6</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>93 3D Magnetic Field 95 Jump Rope Generator</p> <p>CDP 34-1</p> <p>NTQ 34-1</p> <p>PSE 17-1</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <p>Magnetic Pole Magnetic Field Magnetic Domain Electromagnetic</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5g Students know how to determine the direction of a magnetic field produced by a current flowing in a straight wire or in a coil.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe the magnetic field produced by a current-carrying wire.</p> <p>Describe some practical applications of a magnetic field exerting a force on a current-carrying wire.</p> <p>Describe how a galvanometer and a motor work.</p>	<p>Prentice Hall: CH. 36.5, 36.7, 36.8</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>94 You're Repulsive CD 26-1 NTQ 36-3</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <p>Electromagnetic</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5n*</p> <p>Students know the magnitude of the force on a moving particle (with charge q) in a magnetic field is $qvB \sin(\alpha)$, where α is the angle between v and B (v and B are the magnitudes of vectors v and B, respectively), and students use the right-hand rule to find the direction of this force.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe how a magnetic field exerts a force on a charged particle in the field.</p>	<p>Prentice Hall: Ch. 36.6</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>94 You're Repulsive</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>(None)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5h Students know changing magnetic fields produce electric fields, thereby inducing currents in nearby conductors.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Describe how voltage is induced in a coil of wire.</p> <p>State and explain Faraday's law.</p> <p>Describe how a generator works.</p> <p>Compare and contrast motors and generators.</p>	<p>Prentice Hall: Ch. 37.1, 37.2, 37.3, 37.4</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>95 Jump Rope Generator</p> <p>NTQ 37-1</p> <p>PSE 17-2</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Electromagnetic Induction Faraday's Law Generator</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>1h*</p> <p>Students know Newton's laws are not exact but provide very good approximations unless an object is moving close to the speed of light or is small enough that quantum effects are important.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>	<p>Define relativistic momentum.</p> <p>Describe the meaning of the mass-energy relationship and interpret the equation $E=mc^2$</p> <p>Describe the relativistic equation for kinetic energy.</p>	<p>Prentice Hall: Ch. 16.2, 16.3, 16.4</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p> <p>CDP 16-1</p> <p>PSE 8-2</p>	<div style="border: 1px solid black; padding: 2px; text-align: center; margin-bottom: 10px;">KEY VOCABULARY:</div> <p>Relativistic Momentum Rest Mass Rest Energy</p> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">SKILLS FOCUS:</div> <p>Define Describe Compute</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 2px; text-align: center; margin: 10px auto;">EL STRATEGIES</div>	

Standards and Assessments “Students know...”	Task Analysis “Students are able to...”	Adopted Textbook Correlation(s)	Connections	Approx. Time (per 180 days)
<p>5d Students know the properties of transistors and the role of transistors in electric circuits.</p> <p style="text-align: right;">0</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">ASSESSMENT</div> <p>[CST]</p>		<p>Prentice Hall: Not covered in text.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LABS/DEMOS/ ACTIVITIES & RESOURCES:</div> <p>No Labs</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">KEY VOCABULARY:</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">SKILLS FOCUS:</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">LITERACY CONNECTIONS</div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">EL STRATEGIES</div>	